Family Visits to the American Children's Museum: Designing for Child Creativity

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My heart is in the work.

— Andrew Carnegie —

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Abstract

Important in preparing children for their own futures, Lifelong Competencies remain understudied in museums. This research aims to answer calls for evidence by using a progressive focusing approach. Through critical theoretical and conceptual literature review, existing language, models, and approaches that contextualise and underpin the key areas of this thesis are examined and, where appropriate, refined, extended, synthesised, and reframed. Drawing on the Contextual Model of Learning (Falk & Dierking, 2000, 2013) from the field of visitor studies, a refined model useful for understanding visitors' museum experiences, the Informal Educational Environment Visitor Experiencescape (Visitor Experiencescape), is proposed. Further, the advantages of applying Social Learning Theory (Bandura, 1978a, 1978b) in understanding museum learning are examined. Informed by these conceptual and theoretical contributions, a series of three empirical studies seeks to understand how American children's museums can optimise their design and practices to maximise their contribution towards children's creativity during family visits, the Lifelong Competency that findings from Study 1, which was an analysis of 321 mission statements, have identified as American children's museums' most prioritised. After reviewing the literature from across the field of creativity, a synthesis model for understanding creativity, Creativity's Lifelong-Oriented Variables of Experience Representation (CLOVER), is proposed, and a sub-construct of creativity, "child creativity", is defined. Focusing on creativity, semi-structured walking interviews were conducted with 12 museum professionals from six children's museums (Study 2). Findings suggest that children's museums may benefit from a shared language of child creativity and a way to identify and measure it. Further contributing to knowledge, findings suggest that exhibit, institution, staff, child, and caregiver factors influence children's creativity; children's museums include many creativity-enhancing elements, but, in practice, caregivers could be mobilised to better support their children's creativity by enacting mindful behaviours. Focusing on caregivers of 5–8-year-olds, and framed by wise interventions (Walton & Wilson, 2018), the Information-Motivation-Behavioral Skills behaviour change model (Fisher & Fisher, 1992), and intervention acceptability and opportunity (Casale et al., 2023), elicitation research with caregivers was conducted via a survey (Study 3). Results (n = 81) contribute to knowledge by identifying areas of misalignment between caregivers' and museum professionals' perceptions of children's museums, including expectations of adult interaction and beliefs about creative opportunities for adults. They additionally show that, although caregivers are motivated to enhance their children's creativity, they have significantly lower understandings of creativity-related information and behavioural skills. Findings also contribute to practice, suggesting that one promising avenue to support caregivers in enacting creativity-enhancing mindful behaviours may lie in shifting their perspectives to recognise the children's museum as an opportunity for them to facilitate their children's creativity and to be creative alongside and with their children. The findings further indicate that these efforts might be most accepted in the children's museum context when delivered through videos that highlight information about the conditions that support children's creativity and demonstrate and teach about creativity-related behavioural skills. Conclusions are drawn across the studies through an experience lens, and limitations are addressed. Finally, future applications of key theoretical and conceptual approaches are presented, and broadening implications are explored in relation to time and context.

Chapter 1

Introduction

Acknowledging the important influence of an individual's environment, child development and education research has increasingly left the lab setting in favour of children's real-world settings. Much of this contextually situated work has focused on the home and school environments. However, according to Oldenburg (1989), there are *three* distinct places that adults spend their time: the first place being the home, the second place being work, and the third place being "the core settings of informal public life" (p. 16), such as coffeehouses, pubs, cafés, taverns, and beer gardens. Centred around adults and the ways in which they interact, these third places, to an extent, "shut out" children and youth (Oldenburg, 1989). Nonetheless, while their places may be different than those of adults, children similarly spend their time across three distinct places: their first place being the home, their second place being school, and their third place being community-based settings that children are frequent patrons, visitors, or participants of (e.g., shops, playgrounds, parks, libraries, museums). Each of the three places offers the opportunity for different types of interactions with unique benefits. Thus, while valuable insights have been gained from work conducted in first and second places, that third places have been relatively overlooked in education research could have grave consequences. We need to know more about these places and their opportunities to responsibly and holistically support children in living into their potential.

One important subset of third places is the informal educational environment. Informal educational environments are defined here as *third places with a primary educational purpose, such that pre-specified learning goals are designed for, but actual learning must be actively unlocked through personal engagement and, thus, will be individually unique but neither required nor assessed*. While informal educational environments are pedagogically grounded and purpose-built, with a primary aim to support positive development, they are importantly experienced in informal and personal ways that harness positive affective engagement (e.g., fun, enjoyable, interesting), self-motivation, free-choice, play, and real-world relevance. As such, informal educational environments may contribute to children's growth and development in ways that are meaningful but not found elsewhere. For example, the prescribed content and demotivating didactic instruction

common in the classroom (Hirsh-Pasek et al., 2009) restrict children's freedom to follow their own interests and choose their preferred modes of inquiry (Gray, 2013). As a result, learning tends to be "learning about" rather than constructing ideas and concepts (Sternberg & Lubart, 1991b). However, as Vygotsky (1926/1997) reminds us:

> It is not so important to teach a certain quantity of knowledge as it is to inculcate the ability to acquire such knowledge and to make use of it. And, like everything else in life, this may be achieved only in the very process of labor and in the very process of attaining this knowledge. (p. 339)

Museums are one particular informal educational environment with great potential for contributing to children's holistic development through experiential engagement.

The Museum

Since its inception, the modern museum has been a place that people are self-motivated to visit and learn from (Winchell, 1891). In fact, it is seen that museum visits supplement and complement the learning that occurs in home and school environments (i.e., first and second places) (Farmer, 1995; Oppenheimer, 1968; Price & Hein, 1991; Rapp, 2005; Rogoff et al., 2016). Child development and education theorists have acknowledged the enriching and indispensable role that museums play. For example, Vygotsky was in favour of visits to such public institutions (Rogoff, 1990), and Dewey proposed that museums, similar to a library, be built into the ideal school (Hein, 2004). It follows, then, that education has become a primary focus of museums (e.g., Barriault & Pearson, 2010; Carter, 2017; Dillenburg, 2011; Munley & Roberts, 2006), the reason for billions of dollars of museum spending each year (American Alliance of Museums, n.d.-d), and central to museum mission (Bitgood & Shettel, 1996). Despite this, the field is lacking evidence to substantiate their perceived outcomes and inform their design and practices (e.g., Luke & Windleharth, 2013; O'Neill, 2006).

While research and evaluation have been conducted across the museum field, this work has primarily measured visitor demographics, attendance, and exhibit engagement, output measures that have been inadequate in determining the outcomes of museum engagement, the impacts of museum visits, and the mechanisms through which these might be achieved (Adams, 2012; Joslin, 2021; Madden, 1985; Preskill, 2011; van Schijndel et al., 2010). Though these administrative measures support resource allocation for operational sustainability, they do little to inform success, and even less to understand which factors of

experience design and museum practice optimally contribute to museum learning. By leaving museums' full potential untapped, we are falling short of harnessing their unique opportunities to maximally contribute to visitors' growth, at a disservice to the very audiences museums aim to reach. In fact, over-relying on easily measurable variables, museum leaders themselves struggle to demonstrate public value (Munley & Roberts, 2006). Additionally, even if they believe learning took place, parents cannot always describe what or how their children learned during museum visits (Archer et al., 2016; Letourneau et al., 2017). Such trends of museum research as a whole are also reflected in children's museum research (Mayfield, 2005).

The Children's Museum

Unlike the traditional museum's collection of objects or singular subject of focus, "children's museums are user friendly, interactive, hands-on, attractive, non-threatening and stimulating places designed and developed for children" (Mayfield, 2005, p. 181). The exhibits and activities they offer are intended to be fun (Enseki, 2007; Mayfield, 2005), and children's museum design and practices are guided by children's interests, contexts, developmental levels, and learning behaviours (Cohen, 1987; Enseki, 2007; Farmer, 1995; Lewin, 1989). Though scaled for children (Hackett et al., 2018), children's museums are meant for an intergenerational audience engaging together (Farmer, 1995; Mayfield, 2005).

Children's museum professionals believe that children's museums differ from other museum types in *what* is learned (e.g., more focused on social and emotional growth and on the whole child, less focused on cognitive learning), *how* it is learned (e.g., more through play, with interactive and hands-on engagement), and *who* the audience is (e.g., focused on children and families) (Luke & Windleharth, 2013). Despite differences between the various types of museum institutions, only 14% of research on children's learning in museums has been conducted in *children's museums* (Andre et al., 2017). While previous work has alluded to positive learning outcomes after children's museum visits, it has primarily used descriptive designs; although this descriptive research has offered rich context and provided insight into how visitors interact with and within children's museums, practitioners want to know the outcomes and impact(s) of children's museums *and* which factors best contribute to museum learning and children's development (Luke & Windleharth, 2013). In fact, "children's museums can have great value, but this value is not inherent in the existence of the museums: it must be articulated and planned for" (Herz, 2017, p. 148).

With goals nearly as diverse as there are museums, disparity between stakeholders on the what and how of children's learning at museums, and key terminology (e.g., museum, creativity, play, family and family learning) that remains largely undefined and/or not widely agreed upon (e.g., Carter, 2017; Dillenburg, 2011; Ellenbogen et al., 2004; Grossnickle, 2016; Hassinger-Das & Hirsh-Pasek, 2018; Luke et al., 2017; Luke et al., 2021; Mayfield, 2005; O'Neill, 2006; Plucker et al., 2004; Zosh et al., 2017), it might be that we are talking past one another rather than working together to optimise the children's museum visit and reap its maximum benefits.

Lifelong Competencies

To be best prepared for their own futures, children need more than content-centred knowledge (e.g., Golinkoff & Hirsh-Pasek, 2016). Children's museums provide an environment that is poised to contribute to visitors' development of Lifelong Competencies, defined in the context of this research as malleable, domain-general skills, attitudes, abilities, and understandings that support individuals in being resilient and adaptable in the face of changing and unpredictable circumstances of their own future (see section 'Lifelong Competencies' in Chapter Five, Kupiec, 2024). However, little research to date has explored Lifelong Competencies within children's museums, and even less guidance on how to design the children's museum experience to optimally support their development is available. In response, the overarching goal of the present work is to investigate how children's museums can optimise their design and practices during family visits to maximally contribute to the growth and development of a Lifelong Competency they prioritise. Priority was examined through an analysis of children's museum mission statements, the first study of this thesis, which identified creativity as the most prioritised Lifelong Competency (see Chapter Five, Kupiec, 2024).

Creativity

Evidence suggests that creativity has widespread benefits from academic achievement and potential realisation (Fasko, 2001; Gajda, Karwowski, & Beghetto, 2017; Joubert, 2011) to life-flourishing and wellbeing (Conner et al., 2018; Fanchini et al., 2019; Tang et al., 2021). Though not often conceptualised as a growth-oriented competency, with such significant value, it is essential to support creativity and nurture its development—these efforts should begin in childhood (Kim, 2011; Vygotsky, 1967/2004). In addition, though everyone has creative potential, there are a variety of factors, both individual and

environmental, that can influence creativity (see Chapter Six). Despite the contribution of the environment towards creativity, Niu (2007) reports on a search of the Psych-INFO database, which revealed that while over 8000 empirical papers investigated creativity and *individual* factors, only about 300 examined creativity and *environmental* factors. It is evident that more research is needed to understand and optimise environments to enhance creativity. As a designed environment with a stated and prioritised purpose of creativity, the children's museum would particularly benefit from such work.

Wise Interventions

Various approaches have been taken across the museum field to orient, guide, support, and facilitate visitors' experiences. As conceptualised by Walton and Wilson (2018), "wise interventions" focus on the understandings and beliefs that individuals already have and then, using theory and research, implement brief and minimally directive interventions that offer new information to alter their understandings and subjective meaning-making of themselves, others, and their situations. Given the short duration and infrequency of museum visits, as well as their personalised engagement and long-lasting impact, the brief and minimally directive nature of wise interventions make this approach well-suited to the museum context. However, wise interventions have, to date, not been applied to the museum field. Seeking not only to understand museum design and practice, but also to optimise it as a way of maximising visitor learning, it would be valuable to explore the promising but untapped potential of how a wise intervention approach could aid the development of museum-provided guidance and support, which may ultimately enhance visitors' experiences.

Research Aims

Children's museums are perceived as rife with opportunities to support children's development and spark learning. However, the relative novelty of the *children's museum* coupled with the infancy of the field of research on visitor learning in museum settings—and the even smaller proportion of that research which is conducted in *children's* museums—means that there is a lack of evidence to substantiate these presumed, and at times self-proclaimed, benefits in their entirety. Furthermore, the work that has been conducted to date in the fields of museum and visitor studies has largely eclipsed the holistic potential of museum visits that is central to children's museums. This potential

extends beyond content knowledge gains and includes the development of Lifelong Competencies, such as creativity.

There is still much to understand about what, how much, and how best learning happens at children's museums. This research will focus on the construct of creativity during family visits to children's museums in the United States of America (henceforth, American children's museums). The structure for the series of three studies in this thesis has been guided by Voogt and Roblin's (2012) framework of intended curriculum, implemented curriculum, and attained curriculum. Aiming to contribute to informing the optimisation of museum design and practices, rather than simply identify what is attained, this framework has been adapted to intended practice, implemented practice, and informing practice (see Figure 1.1). *Intended practice* (Study 1) will focus on the institutional voice, analysing mission statements to explore which Lifelong Competencies children's museums prioritise and how they aim to achieve these goals. In doing so, Study 1 will help maintain relevance of the present work to children's museums' existing priorities, as a best effort to conduct meaningful work that could directly contribute to children's positive development. Then, concentrating on creativity, which was identified as the most prioritised Lifelong Competency of intended practice (see Chapter Five, Kupiec, 2024), *implemented practice* (Study 2) will focus on museum professionals' voices to understand what they do and what they believe might further enhance children's creativity during family visits. In doing so, Study 2 will examine children's museums' current design and practices, and how these influence families' experiences and support and/or hinder children's creativity. Finally, as these findings identified caregivers enacting mindful behaviours as the most promising avenue for enhancing children's creativity (see Chapter Seven), *informing practice* (Study 3) will focus on caregivers' voices to explore how children's museums might effectively support them in enacting creativity-enhancing mindful behaviours during family visits. In doing so, Study 3 will examine caregivers' existing beliefs and understandings to contribute to informing the design and delivery of a caregiver-directed wise intervention with the potential to enhance children's creativity.

Benefitting experience design and museum practice, the insights, understandings, and contributions gained through this work have great potential for real-world impact, as children's museums annually serve over 40 million visitors (Association of Children's Museums, n.d.-d). Utilising a progressive focusing approach that draws upon mission

statement analysis, semi-structured walking interviews with museum professionals, and survey elicitation research with caregivers of children aged 5–8 years, this research broadly seeks to discover how American children's museums can optimise their design and practices to maximise their contribution towards children's holistic growth during family visits through answering the following research questions (RQs):

Study 1: *intended practice*

Study 1A:

RQ1: What terms are most frequently used in children's museum names?

RQ2: How readable are children's museum mission statements?

RQ3: What do children's museum mission statements tell us about their purpose(s)?

RQ3a: What terms are most frequent in children's museum mission statements?

RQ3b: Which Lifelong Competencies do children's museums prioritise?

Study 1B:

RQ4: How are creativity and curiosity used in children's museum mission statements?

RQ4a: What do children's museum mission statements say about planning for creativity and curiosity?

RQ4b: What do children's museum mission statements say about valuing creativity and curiosity?

Study 2: *implemented practice*

RQ5: What do children's museum professionals believe makes the children's museum a unique place?

RQ6: (How) Do children's museum professionals define child creativity?

RQ7: (How) Is children's creativity supported and/or hindered at children's museums?

RQ8: (How) Do children's museum professionals identify and/or measure child creativity?

Study 3: *informing practice*

RQ9: What beliefs and expectations do caregivers of children aged 5–8 years hold about children's museum priorities and engagement?

RQ10: What do caregivers of children aged 5–8 years believe about children's museums as an opportunity for creativity?

RQ11: How do caregivers of children aged 5–8 years define child creativity?

RQ12: What degree of creativity-related information, motivation, and behavioural skills do caregivers of children aged 5–8 have?

RQ13: What type of intervention might caregivers of children aged 5–8 years most accept in supporting their children's creativity?

RQ14: (How) Do the perceptions of caregivers differ by museum visit experience (i.e., frequent visitors, occasional visitors, nonvisitors), the pedagogical approach of their child's school, their gender, their educational attainment, and their race?

Contribution Aims

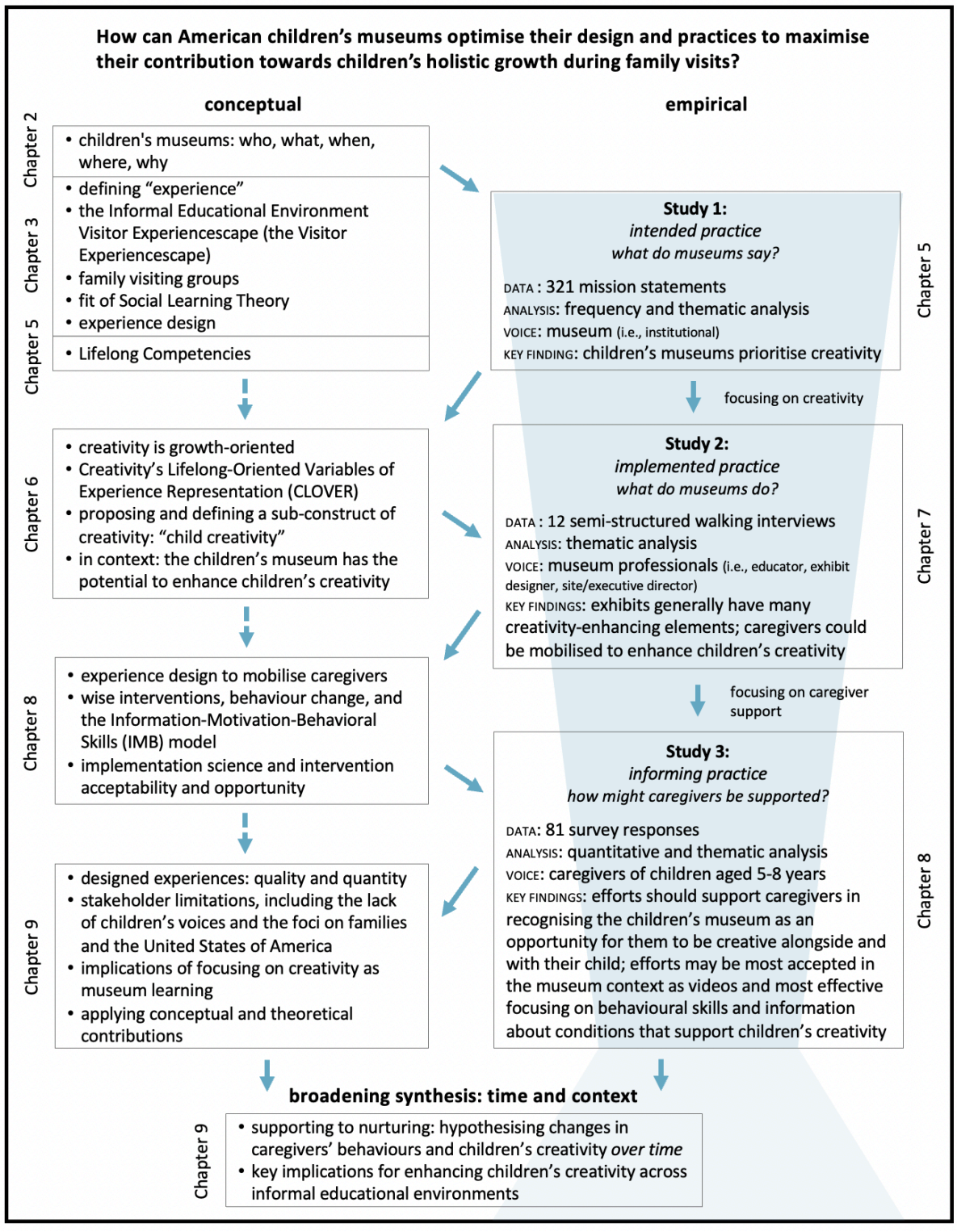
This thesis aims to contribute to theory, knowledge, and practice. Firstly, working within the rapidly expanding areas of visitor studies and creativity, literature review seeks to examine and clarify the constructs, models, and approaches of these fields, contributing to theory. Secondly, through answering the research questions of each empirical study (see section 'Research Aims' above), this work seeks to fill gaps in current understandings across the fields of visitor studies and creativity, contributing to knowledge and informing practice.

Contribution Aims: Theory

As noted by Biesta et al. (2011), educational research has a tendency to move away from theory; however, theory plays an important role in both research and practice, such that the authors argue for more theorising and capacity building in relation to theory. Considering the disparity between stakeholders and the lack of shared language across the museum and creativity fields (see section 'The Children's Museum' above), such capacity building is not only relevant, but it may be especially crucial for the present work. Consequently, this work aims to contribute to theoretical capacity building in the fields of visitor studies and creativity by responsively reviewing the key constructs, models, and approaches in each field, and, where necessary, refining, extending, synthesising, and/or reframing them.

Figure 1.1

Overview of the Thesis



According to Biesta et al. (2011), theories function to explain causative processes and mechanisms, "add plausibility" to and help us "make sense" of empirical findings, and mediate how research insights are taken up in practice. Beyond an importance of theory and theorising that is related directly to empirical work, the authors highlight the following two positive aspects of autonomous theorising:

> Such more autonomous forms of theorising can, on the one hand, provide important starting points for empirical research first and foremost with regard to the *conceptualisation* of the phenomena one wishes to investigate. . . . the world – and more specifically the social world – never appears *un*conceptualised so that not to engage with the ways in which one can conceptualise one's research object runs the risk of uncritically accepting prevalent definitions and conceptions of the object under investigation. . . .
>
> More autonomous forms of theorising have, on the other hand, also a more practical significance, particularly where such forms of theorising help us to see things differently, so that it becomes possible to see the particular choices implied in existing descriptions and representations. (Biesta et al., 2011, p. 233-234, emphasis in original)

Accordingly, it becomes essential to understand any phenomenon, its conceptual constructs and their interrelations, and its theoretical underpinnings before effectively building knowledge or enhancing practice.

To conduct meaningful work, conceptual and theoretical clarity is needed. Both the fields of visitor studies and creativity have undergone rapid growth in recent years. Though this empirical work has deepened our understandings and informed our efforts, the prolific progress has, at times, been fragmented. This is unsurprising given that the museum studies and creativity fields are diversely interdisciplinary (e.g., Astor-Jack et al., 2007; Gardner, 1993; Sawyer, 2012; Silvia, 2018). However, it underscores the need to step back and reflect, as limited shared language and narrow understandings offer limited application. By bringing together the contributions of each perspective and empirical approach, review and synthesis can reduce limitations. In fact, according to Yadav (2010), "knowledge development is a gradual process in which key building blocks are added over a long period" (p. 5), and, as such, benefits from "a balance between conceptual and empirical

contributions" (p. 5). It is time to consider how the building blocks not only stack up together, but how they fit together.

Finally, through the lens of eventalisation, theoretical work "is not about bringing what is strange into the domain of understanding – theory rather has the task of generating more and different understandings" (Biesta et al., 2011, p. 233). This insight holds great relevance for the present work, as museums and creativity are rooted in historically-informed traditions and entrenched in assumptions that do not always transfer well to the present contexts, such as traditional museum approaches in children's museums and adult creativity conceptions applied to children's creativity. In fact, despite differences between museum types, only 14% of research on children's learning in museum contexts has been conducted in children's museums (Andre et al., 2017). Additionally, perhaps as a result of creativity not commonly being framed as growth-oriented and because much of the research in the field of creativity has been conducted with adults, children's creativity has been defined similarly to adults' creativity (e.g., novel and meaningful) but simply modified to a smaller sphere of influence (e.g., Beghetto & Kaufman, 2007; Kaufman & Beghetto, 2013). Trying to construct knowledge on top of conceptualisations that are less sensitive to children and their ways of engaging with their worlds risks further muddling the fields. We have, thus, reached the point where reflection is necessary to build conceptualisations that are not only more comprehensive and complete at a broad level, but also contextually relevant, rather than uncritically employing theory that defaults to a best-fit adaptation in different contexts and applications.

Amidst rapidly expanding fields and in response to contemporary issues, it is time to examine the language, approaches, models, and underpinnings that are used to discuss, explore, explain, and interpret both museum visits and creativity. It is additionally essential for the purposes of the present thesis to consider how these fields may fit together. This thesis aims to contribute to theoretical capacity building through critical review of the literature relating to children's museum family visits and creativity and, where appropriate, offering conceptual and theoretical redefinition, refinement, extension, and synthesis. In doing so, different and nuanced perspectives, approaches, models, and understandings may offer new lenses from which to build knowledge and develop effective practices, as well as a language to facilitate discussions within and across research and practice.

Literature Review Approach

Critical Theoretical and Conceptual Review

Yadav (2010) writes that conceptual contributions "take stock of emerging empirical evidence, concepts, and explanations" (p. 5), and that "theoretical understanding of a focal phenomenon evolves from the collective, synergistic research efforts that occur in the discovery and justification phases" (p. 5). These statements highlight the importance of not only being familiar with the previous work in a field and its gaps, but also of considering how the work comes together as it continuously emerges and evolves, and what we can learn from it as a collective body of literature. Moving beyond reporting what already is, literature reviews can serve to review, critique, synthesise, and reconceptualise what else could be (Torraco, 2016).

According to Torraco (2016), "critical analysis enables the literature review to build on the strengths and limitations of the literature to create a better understanding of the topic through synthesis" (p. 420), which "is a creative process that integrates existing ideas with new ideas to develop new perspectives on the topic" (p. 409). As such, it becomes possible to "conceptually reconstruct the topic for a clearer, more complete, and up-to-date conception of the topic" (Torraco 2016, p. 419-420). This type of review extends the conversation in a field by putting the work and thinking from across the field into dialogue together rather than throwing any of it away. Critical theoretical and conceptual review can, therefore, contribute to building a stronger, more complete foundation from which to advance a field, including guiding both empirical work and practical application.

With growing bodies of evidence and their consequential practical applications in the visitor studies and creativity fields, critical theoretical and conceptual review is not only timely, but also necessary. Thus, and as argued for theoretical capacity building above, this work's literature review aims to contribute to better understandings that support the knowledge base and remain responsive to contemporary considerations, which can, at times, open unique doors and promising avenues for improvement that have previously been fragmented or unexamined.

Iterative Literature Review within Progressive Focusing

Literature review of this thesis is spread across several chapters, both preceding and punctuating the empirical work (i.e., Chapters Two, Three, and Six), as well as introducing and contextualising each study of the integrated thesis format (i.e., Chapters Five (Kupiec,

2024), Seven, and Eight) (see Figure 1.1). Given the unpredictable nature of progressive focusing, "the order in which research activities take place is highly flexible and involves going back and forth" (Sinkovics & Alfoldi, 2012, p. 824), including a continuous review of both familiar *and* new literature to engage with and examine previously unexplored areas. As such, the iterative nature of literature review took on two distinct forms across the present work. Firstly, it was iteratively refining, returning to the same literature with fresh foci. This allowed, for example, conceptualisations and theory to reflectively inform each other. Secondly, it was iterative across the literature, such that there was continuous review of new literature as the progressive focusing approach guided the work. At times, these two forms of iterative review functioned together; for instance, museum literature was revisited to juxtapose creativity-relevant insights with the literature on creativity in context.

Contribution Aims: Knowledge and Practice

Theoretical underpinnings and conceptual foundations provide the language and shape to explore a field, distil insights, and clarify their applications. Each of the three empirical studies of this thesis aims to contribute to knowledge and practice through answering a root question seeking to build understanding (see Figure 1.1): "*What do museums say?"* (Study 1), *"What do museums do?"* in relation to creativity (Study 2), and "*How might caregivers be supported?"* in relation to enacting creativity-enhancing mindful behaviours (Study 3). Alongside filling in gaps identified through literature review and addressing areas highlighted by findings of the present empirical studies through the progressive focusing approach, this work importantly coincides with key questions that have been recognised across the children's museum field. These questions have been compiled in the *Learning Value of Children's Museums Research Agenda*, which represents "what needs to be known about children's museums, the learning that takes place in them, and the impact they have on the lives of the children, families, and communities they serve" (Luke & Garvin, 2014, p. 1).

Study 1: What do museums say?

Intended practice of Study 1 seeks to contribute to knowledge by understanding what children's museums say through their institutional voice, as represented by their mission statements. In particular, this study aims to identify what Lifelong Competencies they prioritise and the ways in which they intend to meet these goals. Through the progressive focusing approach, findings will support the relevance of this thesis by

informing the focus of the subsequent empirical work, such that the contributions it makes to knowledge are more likely to hold meaning and value for application to practice. In addition, identifying priorities can support institutional and research decision-making by indicating areas for resource allocation. In fact, an informal learning experience's purpose determines its design and practices (Wardrip & Brahms, 2020), and a museum's mission statement guides planning and evaluation by providing institutional focus and setting a standard to evaluate success against (American Alliance of Museums, n.d.-c).

Study 2: What do museums do?

Implemented practice of Study 2 seeks to contribute to knowledge and practice by exploring what children's museums do in relation to creativity, and how these design and practice decisions, along with museum professional-reported visitor engagement factors, influence children's creativity during family visits. In addition to being identified as a priority of children's museum themselves in Study 1 (see Chapter Five, Kupiec, 2024), the *Learning Value of Children's Museums Research Agenda* includes two priority areas of research that explicitly refer to "creativity" (i.e., "What at a children's museum promotes *creativity* and problem solving?" (Luke & Garvin, p. 3, emphasis added) and "What are the factors (parent-child interactions, design, staff interactions) that influence the learning (critical thinking, *creativity*, innovation) in children's museums?" (Luke & Garvin, p. 3, emphasis added)). Furthermore, museum professionals themselves would like to know the impacts of their work and which factors best contribute to these impacts (Luke & Windleharth, 2013). This is particularly important, as creativity is context-dependent, yet the influence of environmental factors has been significantly understudied (e.g., Niu, 2007; see section 'Creativity' above). Despite the rapid uptick in research over the past decade in children's museums, little research to date has examined creativity in particular, and even less is known about the factors that support and/or hinder it during children's museum family visits. Thus, this work intends to fill some of the present gaps in the field regarding creativity-related knowledge and practice.

Little of the research that has been conducted in children's museums has drawn upon museum professionals' voices (Luke & Windleharth, 2013). Nevertheless, a priority area of the *Learning Value of Children's Museums Research Agenda* includes the following: "What do children's museums afford or provide (unique qualities) to the individual, family, community looking through the lenses of *museum professional, institution*, children's

museum, and informal learning[?]" (Luke & Garvin, 2014, p. 3, emphasis added). Thus, the knowledge gained through Studies 1 and 2 aim to fill gaps in relation to two recognisably different lenses (e.g., the voice of the: (1) institution and (2) museum professional), as well as allowing the voices to be compared. Beyond contributing to knowledge by better understanding the different levels that exert influence on visitors' experiences, such insights can also contribute to practice. In particular, they can help in addressing experiential (mis)match, which requires understanding both the individual and their environment—an environment that, in the museum context, is broadly guided by the institutional voice and more directly realised by museum professionals.

Study 3: How might caregivers be supported?

A substantial contribution of Study 2 (see Chapter Seven) is the understanding of caregiver interaction as not only a matter of involvement, but also, and perhaps more importantly in relation to children's creativity, of attention. Informing practice of Study 3 seeks to contribute to knowledge through exploring caregivers' perceptions of children's museums and their creativity-related understandings. It also seeks to contribute to practice by investigating how caregivers might be most open to receiving support and guidance. This study aims to make these contributions through positioning behaviour change as a lens for caregiver-directed museum practice. Specifically, wise interventions (Walton & Wilson, 2018) are proposed as a potentially fruitful approach to providing support, and the Information-Motivation-Behavioral Skills behaviour change model (Fisher & Fisher, 1992) as a way to inform the development of effective guidance.

The perspective shifts offered by wise interventions (see section 'Wise Interventions' above) necessitate deep knowledge of individuals' understandings and beliefs, as well as their acceptability for how support and guidance is delivered. Although evidence suggests that caregiver-directed museum interventions are successful at mobilising caregivers (e.g., parent-child dyadic conversations: Kupiec et al., 2023), little of this work has begun with elicitation research. As such, while we know about the various behaviours and roles that caregivers may enact during children's museum family visits, little is known about *why* they enact the behaviours that they do, and thus what targeted support and guidance might change them. Filling in these gaps could lead to more effective and optimised efforts.

Highlighting the field's awareness of potential perception-based caregiver-museum (mis)match and the need to explore how such gaps might be closed, the *Learning Value of*

Children's Museums Research Agenda includes the following questions: "What do community members (e.g., *parents*, teachers, children, stakeholders) perceive the benefit/value of children's museums to be?" (Luke & Garvin, 2014, p. 3, emphasis added), "How can we better communicate to adults the layers of experiences possible in children's museums?" (Luke & Garvin, 2014, p. 3), and "What are the most effective strategies for helping parents understand their roles?" (Luke & Garvin, 2014, p. 4). To contribute to knowledge and informing a potentially more effective and optimised approach to caregiver-directed intervention, the elicitation research of Study 3 aims to better understand caregivers' perceptions of children's museums, their role expectations during children's museum family visits, their creativity understandings, and their creativity-related intervention acceptability.

As a whole, and guided by a progressive focusing approach with iterative literature review and three consecutively focused empirical studies, this thesis aims to make contributions to the fields of visitor studies and creativity through deepening theoretical and conceptual foundations, adding to knowledge, and informing practice. Through the synthesis of disparate but growing fields, this work aims to provide cohesion in language and more complete and up-to-date conceptualisations and theoretical underpinnings. This is first necessary, as it would be futile to endeavour to optimise design and practices without considering how they may function. Such refinements, extensions, syntheses, and reframing aim to, in turn, serve as a foundation to guide, explain, and interpret the empirical work seeking to fill gaps in current knowledge, and, as a result, contribute to informing practice. Collectively, these contributions will support our understanding of how American children's museums can optimise their design and practices to maximise their contribution towards children's holistic development during family visits, the overarching research question of this thesis.

Structure of the Thesis

Chapter 2

Children's museums are not only distinct from school, home, and other community settings (e.g., playgrounds), but also from traditional museums. A general usage of the term "museum" can be helpful in many ways, particularly for institutional planning. However, due to differences between museum types in their exhibits, visitors, and learning outcomes, adopting a broad classification of "museum" without deeper consideration is at risk of

misusing research and detrimentally misguiding design and practice. As such, and to reduce confounding factors, the empirical research studies conducted as part of this thesis will focus on children's museums.

To contextually ground the present work, Chapter Two will explore and delineate the children's museum as a unique informal educational environment by first drawing the distinction between the children's museum and other types of museum institutions (i.e., "what" is a museum and, further, "what" is a children's museum). The chapter will next discuss the ways in which the children's museum is unique in relation to its exhibits (i.e., "where" a museum visit occurs), visitors (i.e., "who" comes to the museum), the influence of conditions surrounding a visit (i.e., "when" in time or within a visitor's day a visit occurs), and museum learning (i.e., "why" visitors visit and the benefits they gain). Definitions are offered for the museum, its exhibits, and museum learning that encompass broader meanings for field-wide application, inclusive of children's museums, *and* allow for further institutional type specifications for nuanced discussions, such as of children's museums.

Although over the course of this discussion it is apparent that key differences do exist between museum institution types, particularly between children's museums and traditional museums, it is also evident that visits to different museum types are similar in important ways. Thus, this chapter concludes by addressing that the distinctions between museum types do not inherently preclude the relevance or application of museum research across different museum institution types, including to and from children's museums. Instead, it calls for thoughtful consideration rather than blanket adoption.

Chapter 3

Chapter Three will discuss *how* museum visits unfold, including how museum learning emerges and can be designed for during children's museum family visits. First, an "experience" will be defined as *a generative engagement between an individual and their environment, from which intangible and personally unique changes arise during a mutually dynamic process that is temporally bound, but which sits subjectively meaningful within, and connects to, the individual's ongoing life journey,* and the four distinctive components detailed: engagement, generativity, individuality, and time, including the two spans of time of the microexperience and the macroexperience.

Next, to capture the complexity of factors that contribute to shaping a personally meaningful informal educational environment experience, this work will draw upon, refine,

and extend the Contextual Model of Learning (CML) proposed by Falk and Dierking (2000, 2013) with the introduction of the Informal Educational Environment Visitor Experiencescape (the Visitor Experiencescape). In the Visitor Experiencescape, learning emerges at the intersection of the visitor portrait, social situation, and physical environment during the microexperience of a single visit unfolding, while also being influenced by and contributing towards the macroexperience, or the longer arc of an individual's life, within which the microexperience engagement is set. Each of these factors and how they function together are discussed in relation to museum visits.

Families are a distinct visiting group with their own intricacies, resources, and interactions. As such, this work will focus on family visits, mitigating the influence of confounding factors. A "family" is defined as a multigenerational group (i.e., at least two individuals) that includes at least one child, and in which individuals have a sustained relationship. This "does not require a biological relationship but does require a shared history" (Foutz & Emmons, 2017, p. 180). The term "caregiver" will be used in this work to remain sensitive to the different compositions of visiting families, and will be used inclusively to refer to any adult visiting with a child with whom a sustained relationship exists (e.g., parent, grandparent, guardian). However, where prior research and/or research participants (e.g., museum professionals in Study 2) have specified "parents", this term may be used. While visiting families are each their own unique learning systems within the museum (Ellenbogen et al., 2004), each actor plays their own role. The consequences this has will be explored, and the fundamental patterns that reflect a child versus caregiver museum experience will be highlighted.

This chapter will then discuss concerns of (mis)match that may result in stifled or disengaged experiences, potentially impeding or preventing museum learning, including as a result of (mis)alignment across the various stakeholders of a family children's museum visit (e.g., museum professionals, caregivers, children) and from tensions of power and equity between museums and their communities.

This chapter will next review the shortcomings of sociocultural perspectives that underpin much of museum research and, further, how these insufficiencies are pronounced in children's museums. Social Learning Theory (Bandura, 1978a, 1978b) will be proposed as a more appropriate approach to understanding the museum experience, including museum learning, and the ways in which reciprocal determinism, observation, and efficacy offer to

fill the gaps of a sociocultural perspective will be examined. As each museum visit is a personally created experience, the term "(inter)action with(in)" is introduced to capture the types of engagement that occur across a visit and influence the museum experience.

Experience design is presented as the way in which museums can offer opportunities that intentionally encourage particular types of visitor engagement and learning, with considerations of unpredictability, variety, balance, and personalisation. It is also discussed how, through experience design, the intermediate role that caregivers serve during family visits is not only recognised but can be explicitly and implicitly supported. The chapter concludes by proposing that museum practice includes the collection of intentional experience elements that museums implement *and* the theoretical approaches, culture, values, and goals that underpin them.

Chapter 4

After reflexively addressing researcher positionality, Chapter Four will outline the methodological decisions made in the thesis, as well as the rationale behind these choices. This will begin with a section on progressive focusing (Cohen et al., 2017), which will discuss how the developing work oscillated between engaging with literature to build theoretical and conceptual understandings and conducting empirical research and analysis. This section also presents the structure that guided the series of three studies of the integrated thesis: *intended practice*, *implemented practice*, and *informing practice*. Adapted from Voogt and Roblin's (2012) conceptual framework of intended curriculum, implemented curriculum, and attained curriculum, this stepwise framing aligns well with progressive focusing, as the present research naturally built on itself to develop deeper understandings, generate more precise insights, and address emerging research questions both responsively and responsibly. The methods and ethical considerations that were taken to answer the research questions of each study will then be described, as well as how the findings of each study informed and focused the work that followed. Through this discussion, it will also be shown how plans and approaches were altered in response to external circumstances and data collection obstacles.

Chapter 5

Chapter Five will present Study 1, which analysed children's museum mission statements to explore the *intended practice* of American children's museums. This chapter constitutes the first findings chapter of the thesis.

Abstract (published): Children's museums are a distinct type of museum—one particularly poised to engage and support the development of Lifelong Competencies that will help children live into their own successful and fulfilling futures. Understudied in the children's museum, which one(s) they prioritize is largely unknown, and, thus, so is their optimization. This work draws upon the important communication tool of institutional mission statements. Frequency analysis of the terms in 321 American children's museum mission statements (Study A) identified that children's museums prioritize the Lifelong Competencies of creativity and curiosity. Thematic analysis of the 119 mission statements that included these terms (Study B) indicated that children's museums' intended practice for achieving creativity and curiosity is through experiences, environments, and play with a focus on hands-on and interactive elements, family-friendly features, eliciting a positive affect, and experiences that are educational and innovative. Furthermore, creativity and curiosity are primarily valued as mediators toward learning. (Kupiec, 2024)
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Chapter 6

Chapter Six will discuss the existing body of work in the field of creativity while introducing a growth-oriented perspective, a new model for understanding how creativity emerges, and a sub-construct of creativity: “child creativity”. It begins by arguing that creativity, a Lifelong Competency, necessitates a growth-oriented perspective and then explains how growth can stem from (1) developmental change, with a critical developmental period in childhood and (2) differences linked to an individual’s life history, including their experiences, opportunities, and expertise.

Creativity will next be discussed as a multi-componential and interdependent construct. Current conceptualisations and models of creativity are reviewed before a new and more comprehensive representation is proposed, Creativity’s Lifelong-Oriented Variables of Experience Representation (CLOVER). The CLOVER accounts for thinking (i.e., general cognitive abilities and creativity-specific strategies), feeling (i.e., personality traits and affective-conative states), and environmental (i.e., physical environment and social environment) components, alongside the inclusion of the potential for growth. It is argued that creativity is an experience, and how the components function as a dynamic system is explained. It is further proposed that while the model applies across ages, the components involved are likely to have different weights for children than adults. Specifically, compared

to adults' creativity, children's creativity may depend more on situational factors of the environment and affective-conative elements and less on general cognitive abilities and creativity-specific strategies. Then, influences of the engaged activity, spontaneity, and the larger context of an individual's life on creativity are reviewed. Finally, the difference between others shaping an individual's creativity by exerting influence via the social environment of the CLOVER versus being engaged together and jointly contributing towards generativity through group creativity is examined.

The creativity that children engage in might be unnoticed and underappreciated because of conceptualisations that fail to adequately capture it, not because it does not exist or is less important than adult or eminent creativity. Defining "creativity" more clearly in children, as well as a clear operationalisation of this definition, would help to measure and enhance it (Cropley, 2001; Treffinger, 1993; Voogt & Roblin, 2012; Zosh et al., 2017). As a result, the next section of this chapter will consider various subjectivities that have plagued definitions of creativity from becoming as useful as they could be. In doing so, it is argued that previous approaches in the field, which have adapted adult definitions for children, relied on definitions that use related constructs, and avoided a definition altogether, have failed to consider important aspects unique to children's creativity. In response, the sub-construct of "child creativity" is proposed and defined as *the integration of something that is not already in the present moment and context into the present moment and context.*

Lastly, given that "some environments provide the basis for lots of creative sparks, whereas other environments may provide the basis for none at all" (Sternberg & Lubart, 1991a, p. 16), this chapter will propose that children's museum family visits have the potential to be an opportune context to enhance children's creativity in the moment (i.e., supporting) and over time (i.e., nurturing).

Chapter 7

Mission statement analysis in Chapter Five (Kupiec, 2024) identified creativity as a priority for American children's museums; however, mission statements and museum practice are not always aligned (e.g., Maynard et al., 2020). Furthermore, creativity is contextually dependent (see Chapter Six), but little research to date has examined children's creativity in children's museums. Thus, Chapter Seven places a magnifying glass over

creativity and explores American children's museums' *implemented practice* (Study 2). This is the second findings chapter of the thesis.

Semi-structured walking interviews at six American children's museums explored 12 museum professionals' conceptions of child creativity, their creativity-related design and practices, and their recognition of visitors' creative engagements and generativity. Museum professionals had difficulty defining child creativity, and examples and anecdotes were abundant in place of a clear definition. Child creativity was predominantly characterised as a process that is condition-dependent but domain-general and related to imagination, discovery, and exploration. Thematic analysis identified five levels of factors that influence children's creativity: exhibit, institution, staff, child, and caregiver. Findings showed that children's museum exhibits generally have many elements of creativity-enhancing physical environments (e.g., real-life links, interactivity, open-ended play, materials unique from home) and offer diverse opportunities for children to be creative (e.g., across domains, interests, materials, levels). Institutionally, creativity is discussed but not defined. Furthermore, findings suggest that limited institutional resources and being held responsible for safety can limit creativity, while partnerships can *support* (e.g., artists-in-residence) or *restrict* (e.g., corporate sponsors) creativity. Staff support creativity in seen (e.g., facilitation) and unseen ways (e.g., using their own creativity to design museum exhibits and activities); however, efforts tend to be implicit. Findings also indicate that creativity is influenced by child factors, including personality, affect, age, developmental stage, background, prior visitation, interests, preferred type of play, mobility, and neurodivergence. Finally, findings suggest that caregivers' behaviours during children's museum family visits can enhance creativity when it is either hands-on or hands-off, but it is important that these interactions be mind-on rather than mind-off, which is instead more likely to hinder children's creativity. Various factors emerged from the data that might influence which behaviours and role(s) caregivers enact (e.g., (mis)understanding of children's museums, fear of embarrassment, child's age, visit frequency, available props or materials). Though caregivers could be mobilised to better support their children's creativity during family visits, children's museums engage in minimal explicit prompting and visit orientation to support caregivers in relation to creativity, and future research is needed.

While many similarities emerged across interviews and between children's museums, several key discrepancies were identified in child creativity conceptualisations

and implemented practice. Moreover, no children's museum had a way of measuring creativity aside from sharing anecdotal evidence, citing it as "abstract"—children's museum professionals would benefit from a shared language of child creativity and a way to identify it in their spaces. Theoretical and practical implications of the findings and limitations of the study are discussed.

Chapter 8

Chapter Eight will build on the findings of Chapter Seven that suggest the most promising opportunity for enhancing children's creativity during children's museum family visits may lie in mobilising caregivers and supporting them in enacting mindful behaviours. In doing so, this study uses elicitation research to explore *informing practice,* seeking to contribute to the effective design and delivery of caregiver-directed support. This chapter constitutes the third findings chapter of the thesis.

This chapter will first address the significance of *how* caregivers behave during family visits and examine the potential of mobilising caregivers, including the importance of reducing caregiver-museum misalignment. The chapter then introduces the wise intervention literature (Walton & Wilson, 2018; see section 'Wise Interventions' above) and argues that wise interventions are expected to be best suited to bring about caregiver change in the museum context. Further, the Information-Motivation-Behavioral Skills (IMB) behaviour change model (Fisher & Fisher, 1992) is borrowed from the field of health research as a framework for investigating caregivers' creativity-related understandings to identify where support would be most beneficial. Finally, considering Study 2 findings that museums have limited and limiting institutional resources and museum professionals want to remain respectful of and empathetic towards less engaged caregivers, intervention acceptability and opportunity (Casale et al., 2023) will be discussed.

To explore how caregivers might be most effectively supported to enact creativity-enhancing mindful behaviours, Study 3 uses an online survey to investigate the perceptions that caregivers of children aged 5–8 years hold regarding children's museum experiences, including their expectations of adult roles during children's museums visits and their beliefs about the children's museum as an opportunity for creativity. It also examines which area(s) of creativity-related understandings children's museums could target to optimally support caregivers' creativity-enhancing behaviours, as well as how caregivers may be most open to receiving this support.

Survey findings (n = 81) show that misalignment does exist between caregivers' and museum professionals' perceptions of children's museum visits, including their expectations of adult interaction and their beliefs about creative opportunities for adults. Further, though caregivers are highly motivated to support creativity, they have significantly lower understandings of creativity-related information and behavioural skills. Taken together, the findings suggest that one promising avenue to support caregivers in enacting creativity-enhancing mindful behaviours may lie in shifting caregivers' perspectives to recognise the children's museum as an opportunity for *them* to be creative alongside and with their children and, further, that these efforts might be most accepted and effective as personal interactions or videos that highlight information about the conditions that support children's creativity and that demonstrate and teach about creativity-related behavioural skills. In light of the present findings and considerations of limited institutional resources and implementation science constructs, it is proposed that videos are the most promising avenue for future work.

Limitations are also discussed, including the small, homogenous sample that prohibited analyses to answer the final research question (RQ14) of exploring whether, and in what ways, the perceptions of caregivers differ by museum visit experience (i.e., nonvisitors, infrequent visitors, frequent visitors), the pedagogical approach of their child's school, their gender, their educational attainment, and their race.

Chapter 9

Chapter Nine will serve as a synthesis chapter. This chapter will first summarise the contributions of the thesis and then draw conclusions across the series of three empirical studies that have been conducted through an experience lens. This discussion will illustrate how children's museums offer opportunities with great potential for children's creativity through their exhibits, which are well-designed for creativity, and their child-centred considerations, which support individual-environment overlap. It will then be argued that, during family visits, videos that support caregivers in recognising the children's museum as a place for their creativity and equip them with behavioural skills and information about the conditions that support child creativity could increase the quality of experiential engagement, thereby maximally tapping into this potential for children's creativity.

This chapter will then present limitations that constrained the work. First, findings that echo, but do not resolve, tensions of power and equity will be addressed. Stakeholder

limitations will also be discussed in relation to the foci on the museum and caregiver voices at the exclusion of the child voice, family visiting units, and children's museums in the United States of America. Lastly, implications regarding the narrow focus on creativity, while informed through the progressive focusing approach, will be considered.

Next, the application of the theoretical and conceptual contributions of the thesis to museum research and practice, including Social Learning Theory, the Visitor Experiencescape, and the value of a "soil" versus "seed" approach to wise interventions, will be examined.

Finally, this chapter will explore broadening implications of the work in relation to time and context. Longitudinal methodologies remain limited in both museum and creativity research. As the studies conducted with both children's museum mission statements and museum professionals illustrate that they are not as concerned about supporting individual experiences of creativity as they are nurturing creativity over time (see Chapter Five, Kupiec, 2024; see Chapter Seven), it will be hypothesised how designing experiences to support caregivers in enhancing individual moments of children's creativity during children's museum family visits might play a role in supporting caregiver behaviour change and nurturing creativity over time. Additionally, recognising that children's museums are a subset of museums and, moreover, that museums are a subset of informal educational environments, key implications for informal educational environments will be discussed, alongside cautions of feasibility and relevance across contexts.

Chapter 2

The Children's Museum: Who, What, When, Where, and Why?

Introduction

Museums have a long history, but they must keep up with and serve an ever-changing landscape, including shifting and expanding purposes, priorities, types of visitor engagement, communities, and learning outcomes. One way of providing for the full range of the public and its diversity of visitor needs has been the introduction of children's museums and their interactive, hands-on offerings. However, the uniqueness of children's museums has, at times, been overshadowed by long-standing but limiting definitions, practices, and perceptions, which have resulted in misunderstandings. More work is needed to recognise and support the specificities and distinctiveness of children's museums. As such, it is first important to understand what a children's museum is, including in relation to other types of museum institutions.

The Children's Museum as a Unique Setting

From Other Environments

Belonging to the important subset of third places termed informal educational environments (see Chapter One), museums are unlike other places where children often spend time, including school, home, and other community settings. Extensive classroom curricular objectives restrict children's self-directed learning (Gray, 2013), which in turn decreases their motivation (Wagner, 2010). Standardised testing further serves as an extrinsic motivator that prioritises memorised answers, stifles student engagement and enjoyment, and sends the message that learning has an endpoint (Gergen & Gill, 2020). The "engagement and relevance" that classroom teaching would benefit from (Wagner, 2010) can be more freely planned for, and is thus more readily found, in museums. In addition, schools "are still organized by time frames not space frames" (Lewin, 1989, p. 64), such as those offered by museum exhibits. Children feel that while both school and museum visits are for learning, museums are a place where they can *play* and that are more fun than school, which instead requires that they *work* (Jensen, 1994; Rapp, 2005). Moreover, that museum field trips are commonplace signifies that schools recognise the ability of museums to offer something different than they can in the classroom, serving as an important supplement to their curriculum.

Children perceive museums not only as different from school but also from home and other community settings (Jensen, 1994). Moreover, family interaction patterns, which influence learning and development, unfold differently between settings. For instance, evidence suggests that parents' use of explanations is higher at home than it is during museum visits (Tenenbaum & Callanan, 2008). Recognising that museums offer unique opportunities, parents report that one motivation of children's museum visitation is to do something new or different (McInnes & Elpidoforou, 2018) and that this helps them learn about their children (Luke et al., 2019). They also appreciate that museums offer materials, settings, and ways of learning they cannot at home, and that their children can learn about different things than they do at home (Weiland, 2015). As an informal educational environment, museums are also distinct from other third places, or community-based settings, children visit (see Chapter One). For example, evidence suggests that children's museums allow different social-emotional learning opportunities than community playgrounds (Luke et al., 2022).

Further distinguishing the museum as a unique contributor to development, the HOME (Home Observation Measurement of the Environment) inventory includes whether or not the child has been taken to a museum (Caldwell & Bradley, 1984, as cited in Linver et al., 2004). Additionally, data from the U.S. Department of Education's Early Childhood Longitudinal Studies Program Kindergarten cohort suggests that museum visits during kindergarten positively impact academic achievement in third grade, even when matched by sociodemographic factors (Swan, 2014). Museums are an important place for supporting children's growth and development, one that is not only different from the other places children spend their time but also distinctively valuable, making it essential to better understand and optimise them.

From Other Museum Types

Unique from other settings, the term "museum" has been used to capture a broad and diverse collection of informal educational environments. For example, Falk and Dierking (2013)

> use the term "museum" to refer to a wide range of free-choice/informal educational institutions, including art, history, children's, and natural history museums; zoos, arboretums, botanical gardens, science centers, historic homes, interpretive sites

> like national parks, visitor centers, archives, and a variety of other exhibits and collections. (p. 25)

However, caution needs to be taken as to not over-generalise the field because, despite similarities, the "curriculum" of these places differs (Rennie & Johnston, 2004). Not only do practices and pedagogical approaches vary, but so too do visitor behaviours. For example, visitors' learning in science centres benefits greatly from physically manipulating materials and props through tangible experiences (Oppenheimer, 1968); conversely, zoos are inherently unable to offer the same level of hands-on exhibit interaction (Barriault & Rennie, 2019). While play is an engagement strategy for many types of museums, it is employed differently across them (e.g., historic homes encourage role-play, science centres welcome action) (Krakowski, 2012). Moreover, though a variety of visitor behaviours are found across museum institution types, there are differences in how often and how long different behaviours occur at each of these (e.g., more silent reading in zoos) (Borun et al., 1997). Evidence also suggests differences in supporting children's learning between museum types (e.g., more scaffolding is used to support learning in children's museums, whereas more technology is used to facilitate learning in science museums) (Andre et al., 2017). Finally, child visitors themselves notice differences between these sites. For instance, Jensen (1994) found that 9–10-year-olds like visiting children's museums more so than other museums (e.g., natural history and art museums) and most frequently rate children's museums as for fun and learning while rating other museums more evenly between fun and learning, learning and boring, and learning and fun/boring.

Museums have often been grouped together because of factors that characterise the institutions themselves (e.g., nonprofit organisation, serving the public, providing exhibits, allowing free-choice educational activity, mission-driven social impact). It would be more practical, especially for visitor education and visit outcome purposes, to group them by their audience and engagement practices. In fact, larger museums often separate—physically and pedagogically—children and adults, indicating that museum professionals recognise that the approaches to support children differ from those for the wider audience (Carter, 2017; Dockett et al., 2011; Enseki, 2007; Mayfield, 2005). Providing even greater separation has been the advent and ascent of the *children's museum.* To appropriately design children's museums and optimally support their visitors, it is necessary to understand this museum type.

What?

According to the Oxford English Dictionary (n.d.-c), a museum is defined as "a building or institution in which objects of historical, scientific, artistic, or cultural interest are preserved and exhibited" (Definition 2.a.). In a similar vein to this focus on *what* is held in collection by an institution, Merriam-Webster (n.d.-c) defines a museum as "an institution devoted to the procurement, care, study, and display of objects of lasting interest or value" (Definition 1). While such a conceptualisation might reflect museums' founding purpose, it does not account for their contemporary reason for being. In particular, it has not kept pace with the turn of the century that has been marked by a focus on visitors, shifting from a space to merely display objects to a place of active learning (Hooper-Greenhill, 1994; Munley & Roberts, 2006). Moreover, visitor wants and needs are changing. For instance, the success of the Van Gogh Exhibit: The Immersive Experience (n.d.) illustrates a desire for more than passive viewing or didactic learning—visitors are not only interested in seeing something or learning factual knowledge behind it, but instead in *experiencing* it and building their own personal meaning, even when it precludes the original prestigious work.

Organisations across the field have begun to conceptualise museums in ways that reflect museums' expanding purposes from a large space to protect and display artefacts and objects (e.g., fossils, gemstones, furniture, paintings, statues, plants, animals) to a place for public learning and community impact, and where visitors derive personal benefits. One way they have done this is by adopting more dynamic and audience-focused definitions. Notwithstanding debate, in their most recent update, the International Council of Museums (n.d.) adopted the following definition in 2022:

> A museum is a not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing. (para. 2)

In addition, the American Alliance of Museums (n.d.-a) states that "museums make their unique contribution to the public by collecting, preserving and interpreting the things of this world" (section Code of Ethics for Museums). Finally, the definition used by The Museums Association (n.d.) in the United Kingdom states that "museums enable people to explore

collections for inspiration, learning and enjoyment. They are institutions that collect, safeguard and make accessible artefacts and specimens, which they hold in trust for society" (What is a museum? section).

Despite these new, more dynamic, and visitor-conscious definitions that no longer centre *primarily* on the objects, they still do highlight what is being collected and researched, preserved and conserved, and displayed and interpreted as a defining feature. Definitions narrowed in these ways do a disservice to all museums, especially to children's museums. The focus on offering learning opportunities about things of the past (e.g., preserving ancient pottery in an art museum) and present (e.g., displaying flowers in a botanical garden) in these definitions precludes how children's museums support interactive skill- and capacity-building explicitly for *their future*. In fact, though some children's museums do have and display artefacts and cultural heritage, these are used more as "real", serving as concrete examples, cognitive anchors, and inspiration to learn with, rather than historied lessons to learn about. Thus, the primary engagement is different: the children's museum is neither transmissive or didactic, nor for learning *about* or through appreciation *of*; instead, it is interactive and for learning *with* and through *using*. As a result, the objects become less important than the visitors that bring the space to life.

Nonetheless, the shift in attention from an institutionally inward focus on collections and preservation to also encompassing externally audience-driven visitor engagement and growth (Ellenbogen et al., 2008) offers a bridge to the children's museum. According to the Association of Children's Museums (n.d.-a):

> A children's museum is defined as a nonprofit educational and cultural institution committed to serving the needs and interests of children by providing exhibits and programs that stimulate curiosity and motivate learning. Regardless of size, all children's museums function across four dimensions, as local destinations, educational laboratories, community resources, and advocates for children. (para. 2)

Without giving inherent or primary value to the objects themselves or positioning them as the primary purpose of the museum, this definition still highlights provision on behalf of the institution (i.e., exhibits and programmes), with a core focus on its visitors and their outcomes.

A more complete definition to capture the broad ways in which "museum" is applied and used would support conversations within and across the field. Inclusively, museums can

be defined as *free-choice, exhibit-based institutions intended for visitors to follow their own interests, enjoy themselves, participate actively, and learn and grow together* (Allen & Gutwill, 2016; Bell et al., 2009; Brown et al., 2019; Crowley & Callanan, 1998; Falk et al., 1986; Rennie & Johnston, 2004). In this definition, it is necessary to clarify that "together" can have two meanings: (1) visitors interacting with other visitors, either within their group or from other groups, and/or museum facilitators and (2) visitors interacting together with the exhibits and the museum voice. Following an inclusive definition of "museum", individual institution types can draw distinctions when doing so would be appropriate or even necessary; in this way, children's museums can be further delineated as *museums that cater to young audiences and their caregivers through developmentally appropriate themes and interactive materials that support holistic growth and lifelong learning.* Despite moving away from a primary focus on objects and artefacts, with the provision of exhibits remaining a key and defining element of museums, it is necessary to further unpack the meaning of, and the components that comprise, an exhibit.

Where?

The foundational element behind museums' offerings to their visitors are their exhibits, and the museum visit happens largely with(in) the exhibits. While, traditionally, "exhibition" was used to describe large spaces (e.g., galleries, halls) with a specified curational focus and "exhibit" the smaller units that comprise a single exhibition (e.g., dioramas, display cases), the use of "exhibit" has grown increasingly ubiquitous in representing both levels in practice and across the literature. "Exhibit" and "exhibition" (henceforth, exhibit), tend to be formally defined as a public display of an object or a collection (Merriam-Webster, n.d.-a, n.d.-b; Oxford English Dictionary, n.d.-a, n.d.-b) and, in practice, typically refer to such objects and collections placed behind protective barriers (e.g., glass cases, ropes, "please don't touch" signs). However, it is apparent that more happens in museums than visitors' viewing of displayed objects. Similar to how the definition of "museum" has required reconsideration for today's broader, more visitor-conscious engagement and experiential purposes, so too does "exhibit". This is especially pertinent for children's museums.

While traditional museum exhibits are often marked by static designs and transmissive informational displays that are seen, thought about, and emotionally felt primarily *from a distance*, the children's museum is characterised by a hands-on and

emergent form of engagement *within* the exhibit. Thus, whereas traditional museums might have few tangibles (Lewin, 1989), the "children-centered design applications, such as interactive environments in museums, present a major departure from traditional practices" (Cohen, 1987, p. 22). As a result, the physical items that make up children's museum exhibits are not objectively valued "objects" or "artefacts", but rather "materials" made valuable and personally meaningful to the visitor through their manipulation and use. Therefore, a significant way in which children's museum exhibits diverge from those in traditional museums is in their exhibit components and the behavioural affordances these offer. In fact, play is a distinguishing characteristic of visits to children's museums compared to traditional museums (Luke et al., 2021). As such, without visitors interacting within exhibits and playing with the provided materials, the children's museum loses significant value, whereas other types of museums remain valuable for the content of the (often rare) objects and collections themselves. This distinction also significantly distances children's museums from key contemporary debates that reference traditional museums' elitist, object-based collections and exhibits amassing, and showing off, wealth and power (e.g., repatriation, restitution, reparation). Further, while barriers are frequently placed in traditional museum exhibits, the shift from objects to materials indicates a substantial shift from a place of "don't touch" to one that is hands-on and interactive, as materials invite visitors to enter exhibits and engage with them to explore, discover, test out, and create. For example, a children's museum in Philadelphia, Pennsylvania is titled the "Please Touch Museum", signalling to visitors their departure from traditional museum visitation expectations, practices, and/or rules.

Museum exhibits are defined here as *themed areas designed for engagement that encourages, but does not control or define, museum learning*. The use of "area" denotes that it is less restrictive than "space", indicating that exhibits consist of both a general space frame *and* its material provision, but more restrictive than "environment", which would account for the social environment created by visitors above and beyond the museum's designed setting. An area's qualifying concept of "theme" does not restrict to a particular type of content (e.g., time period, topic or domain, learning expectation). This is imperative because the primary thematic boundaries of an area vary between institution types. For example, at the children's museum, themes are not as often divided solely by topic (e.g., botanical garden regions with corresponding plants) or time period (e.g., art museum

galleries with pre-classified artworks), but rather by activities (e.g., interactive affordances: water table, art studio, theatre stage) and contextual boundaries (e.g., "grocery store", "fire department"). The term "designed" indicates that there is something intentional about the exhibit (e.g., specified learning goals) and that this intention is pedagogically grounded in how it is implemented, while "engagement" clarifies that what happens also depends on the visitor and their (inter)actions. In these ways, an exhibit is designed to *encourage* particular inter(actions) and learning, but it simultaneously remains visitor-dependent (i.e., *not controlled or defined*). This definition does not specify the *type* of engagement, and thus can be interpreted or applied to a variety of engagements (e.g., cognitive, social, physical, emotional), but it does necessitate some form of attention or involvement. Finally, "museum learning" encompasses a variety of benefits, outcomes, and impacts, and is personal to each visitor and visiting group (see section 'Museum Learning' below for an elaboration of museum learning).

Due to differences in what fills their walls compared to other museum types and their predominant lack of a unifying theme *across* exhibits, it is imperative to unpack the typical types of exhibits in children's museums. Types of exhibits commonly found in children's museums include those for role-play and pretend play, ranging from familiar participatory scripts (e.g., grocery store) to familiar adult scripts (e.g., post office) to unfamiliar but real (e.g., news station) to fantasy (e.g., medieval castles); art studios; makerspaces; spaces and materials for problem-solving, physical play, music, theatre, and building and constructing; sensory engagements, such as water tables and air tubes; and health and wellbeing. Alongside these popular trends, some children's museums, typically those that are larger, do offer exhibits with more explicit informational themes; however, they are designed for children and supplemented with hands-on, interactive, and imaginative displays and programming specifically developed for young audiences (e.g., Dinosphere® at The Children's Museum of Indianapolis). In addition, some children's museums have a domain or content focus (e.g., the Children's Science Center Lab in Fairfax, VA). However, these spaces often include favourites found nearly ubiquitously in children's museums, such that themes appear to be loosely interpreted with a firmer commitment to the overall shared children's museum ethos and what have come to be known as typical children's museum exhibits (e.g., water tables). Finally, some exhibits are intentionally

contextual to directly reflect their own communities (e.g., the Children's Discovery Center in Honolulu, Hawaii is home to a pretend play pineapple field exhibit).

Who?

Filled with exhibits that rest upon visitors bringing them to life, the children's museum is a substantial deviation from the elitist, artefact-oriented and display-based connotation of a museum. However, the term "museum" remains alienating to some, and, at times, becomes a formidable hindrance to visitation, as it conjures up a specific image and script of what individuals feel *should* unfold within a museum space. For instance, particularly for nonvisitors, the term "museum" evokes a place that is unwelcoming, gloomy, and cold; formal, stuffy, and formidable; boring; reminiscent of a library or church; restrictive of behaviour and active participation; and where visitors must be quiet (Du Bery, 1994; Hood, 1983/2007; Hooper-Greenhill, 1994). As discussed above through the need for new visitor-centred conceptualisations, these descriptions are in opposition to what children's museums are and the interactive, material-based engagement opportunities they offer. Furthermore, evidence suggests that museum visits might be encouraged if museums were "brighter, more lively and more exciting places with a more relaxed, casual atmosphere" (Du Bery, 1994, p. 62), descriptions inherently aligned with children's museum design and experiences. Thus, grouping all museum types together can risk becoming a barrier for potential visitors by perpetuating misunderstandings of children's museums.

While it is adults who typically choose to visit a children's museum, children are the primary reason for the visit and integral to the visiting group. Evidence suggests that children have an influential role in how museum visits unfold. For instance, during natural history museum visits, the number of children in a visiting group *and* the age of the youngest child impact adult behaviours (e.g., time spent in the special exhibition; number of stops made) and learning behaviours (e.g., the more children in one's group, the less time spent at information plates and the more time at interactive stations) (Heuken et al., 2021). Moreover, when choosing how to spend their leisure time, frequent art museum visitors most value doing something worthwhile, having a challenge of new experiences, and an opportunity to learn; conversely, nonvisitors most value being with people, participating actively, and feeling comfortable and at ease in their surroundings (Hood, 1983/2007). This focus on enjoying the experience and the company of others rather than concentrating on the knowledge content of exhibits is more relevant and apparent in the children's museum,

as those visiting museums with children are more likely than other visiting groups to report visit motivations of social experience and social learning (e.g., Hooper-Greenhill, 1994; Phelan et al., 2020). This strongly indicates that children's museum experiences would likely have a greater potential desirability for a broader range of the population than other museum institution types, but only if the children's museum and its visit experience are clearly understood.

Museumgoers tend to be from higher socioeconomic status (e.g., Hood, 1983/2007; Hooper-Greenhill, 1994; O'Neill, 2006), and children from households with low socioeconomic status are less likely to visit a museum (Bradley & Corwyn, 2002; Swan, 2014). This might be partially due to factors such as a lack of free time, high cost of admission, and public transportation availability (Davies, 1994, 2005; Du Bery, 1994). Despite programmes such as Museums for All (n.d.) working to lower the cost burden of museum visits, such "museum access problems" (Loomis, 1987) could be perpetuating the elitist perceptions of museums. Parents who have attained higher levels of education are more likely to have prior museum experience (Tenenbaum & Callanan, 2008). Additionally, Hispanic and Latinx children are less likely to visit a museum (Swan, 2014), which may be partially attributed to reports that museum visits are not part of their cultural practice; for instance, Hispanic mothers report less access to and prior experience with museums, which could translate to less comfort when visiting with their own children (Weiland, 2015). In fact, uncertainty about and unfamiliarity with museums create a feeling of "not for us" (Dawson, 2014). Without support or orientation, these perceptions could become a self-fulfilling yet limiting cycle that results in a pervasive and perpetually skewed visitor population—those who visit as children are more likely to visit as adults (Ellenbogen et al., 2008; Hood, 1983/2007).

There is some evidence suggesting that these factors might be less problematic in children's museums, as socioeconomic status impacts not only whether museums are visited, but also the *type* of museum visited; whereas individuals from the upper socioeconomic class prefer art museums, those from a lower socioeconomic class preference a living history museum with a farm (Davies, 2005; Hood, 1996, as cited in Hein, 1998). The hands-on and interactive children's museum experience more closely resembles those institutions with less sociodemographic differences in visitorship. Moreover, "generalizations about the museum visiting habits of different cultural groups may be as

informative about (and dependent on) the content of museums as they are about the characteristics of various groups" (Hein, 1998, p. 149). In fact, visitor engagement increases when exhibits are culturally familiar and consistent with nondominant communities' life histories (Moussouri, 2024). Importantly, children's museum exhibits often reflect themes relevant to children's lives and their communities (see section 'Where?' above).

Museums can benefit all slices of the population, but visitors have historically come from a skewed population. Even though museum types are distinct and some of the conceptual and perceptual barriers of traditional museum visits are less relevant to children's museums, categorising children's museums as museums without signalling what makes them unique, such as how visitors can engage with exhibits, may contribute to unintentionally alienating certain visiting groups.

When?

When a museum visit occurs is not as relevant in terms of distinguishing a children's museum from other museum types, but it is necessary to briefly address the importance of recognising the timing of a visit and the implications this could have. For example, adults of family groups visiting various types of museums report attending primarily due to practical reasons that would be shared among all the members of a community (e.g., weather, day off school) (Geerdts et al., 2015), contributing to factors such as crowding, noise, and higher levels of stimulation. In fact, museum professionals recognise that every day is different, but also that when a visit takes place, either in a day or a week or a year, is pertinent (Leinhardt & Knutson, 2004).

The museum visit is set against a larger backdrop of each visitor's life. Lack of free time is a museum access problem related to who visits, but it is also significant in examining when a children's museum visit takes place, as museum hours are typically when working adults would be at work. In addition, those who geographically live further from children's museums are unlikely to visit as often, and larger museums tend to be "must do" activities that attract tourists, such that a smaller proportion might be repeat visitors. Given that visit frequency changes the visit experience (Falk & Dierking, 2000; Hood, 1983/2007; Leinhardt & Knutson, 2004; Loomis, 1987), these are significant considerations for museum design and practice. Notwithstanding the time and energy it takes to travel to a museum, museum visits are often combined with other activities outside the home (Loomis, 1987). These activities could influence factors such as fatigue, affecting the length and quality of exhibit

engagement; children may be more sensitive to these influences, making it even more important to be conscious and respectful of when they visit.

Why?

There are no pre-requisites to visit a museum (Diamond et al., 2016), no curriculum or syllabus to follow during the visit (Hein, 1998; Hooper-Greenhill, 1994), learning is not required (Diamond, 1999; Vallance, 2004), and visitors are not tested or graded (Semper, 1990). Free from accountability, museums seem particularly attractive to visitors in part because they do not require anything be learned or any proof that it was (Vallance, 2004). Despite this, education is widely seen as central to museums. Museum learning has traditionally reflected factual and content-based knowledge gains, but informal educational environments, such as museums, are particularly well-poised to offer visitors a range of benefits, outcomes, and impacts. To help understand why museum visits may be beneficial, and children's museums uniquely so, this section considers visitors' motivations and the outcomes they may gain from their visits, or their museum learning.

Motivation

Various researchers have investigated museum visitor motivation, and, as a result, a variety of motivation classifications have been offered. Moussouri (1997) identified six motivation categories as education, place (e.g., a "thing to do" when visiting a city), family event (social event: Falk et al., 1998), entertainment, life cycle (e.g., an adult went as a child, so brings their own children), and practical issues (e.g., weather, proximity to museum). Packer and Ballantyne (2002) proposed five motivation subscales of learning and discovery, passive enjoyment, restoration, social interaction, and self-fulfilment. Falk (2006) identified five identity-related motivations as the explorer; facilitator; professional/hobbyist; experience seeker; and spiritual pilgrim (rechargers: Falk, 2009; Falk, 2011), which he later expanded to include two more identity-related motivations: respectful pilgrims and affinity seekers (Falk, 2011). Ellenbogen, Falk, and Goldman (2008) proposed seven categories of motivation, including entertainment, social, learning, life cycle, place, practical, and context or content. Phelan, Bauer, and Lewalter (2018) presented six visit motivation categories of learning and pursuing interests, relaxation and recuperation, social learning, social enjoyment, establishing social contacts, and popularity of the site. From reviewing these visitor motivation classifications, it is evident that, while the terminological labels and categorical boundaries may differ across conceptualisations, there is a distinctive trend:

factual and content learning is only one of several important motivations, which more completely encompass social, personal, practical, experiential, and affective reasons. Moreover, a wealth of evidence suggests that visitors often have more than one motivation for a visit (e.g., Archer et al., 2016; Briseño-Garzón et al., 2007b; Ellenbogen et al., 2008; Moussouri, 1997; Phelan et al., 2018).

Not only do museum visitors have personal motivations and agendas for their visits, but these also vary by type of institution and visiting group composition (e.g., with versus without children) (Doering, 1999; Packer & Ballantyne, 2002; Packer & Bond, 2010; Pekarik et al., 1999; Phelan et al., 2018; Phelan et al., 2020). For example, whereas science museum visitors might be particularly motivated by learning and pursuing interests, zoo visitors are more motivated by relaxation and recuperation, social learning, and social enjoyment (Phelan et al., 2018). Interestingly, while visitors report similar levels of visit satisfaction and learning across institution types, which highlights museums' shared educational purposes, their perception of a visit as being more for learning or entertainment differs by institution type, as do self-reported learning participation incentives (e.g., the opportunity to: participate actively, ask questions) (Packer & Ballantyne, 2002). In addition, the type of experience (i.e., object, cognitive, introspective, social) that visitors report to be most satisfying varies between institution types, visitor age, and personal experience (Doering, 1999; Pekarik et al., 1999). For instance, art museum visitors tend to prioritise object experiences, living history museum visitors introspective, science museum visitors cognitive, and children's museum visitors social (Doering, 1999).

Outcomes

That a wealth of evidence illustrates that visitors' motivations influence their visit behaviours and, in turn, their learning outcomes (e.g., Briseño-Garzón et al., 2007b; Ellenbogen et al., 2008; Falk, 2006; Falk & Storksdieck, 2005; Falk et al., 1986; Falk et al., 1998; Falk et al., 2007; Hooper-Greenhill, 2004) suggests that the plethora of motivations would also translate to a multitude of visit benefits. In fact, in light of evidence that most visitors made little factual knowledge gains, Doering (1999) offered this vital reframing and expanding awareness:

> exhibitions and programs designed to be communication media rarely conveyed the desired messages to even half of their visitors. . . . But what if all visitors were not willing to receive messages in the exhibition? Perhaps, we reasoned, these

> individuals who got the message were the *only* ones who came to the exhibition or program seeking that type of experience or information. Perhaps the other 50% or 35% or 80% had equally legitimate needs that were not even considered by the museum and perhaps not met. Or, if they were being met, we did not know it. (p. 7)

Undoubtedly, content knowledge is neither the only intention nor the only benefit of museum visitation. However, less research has been conducted to identify and explore other possibilities, as well as to understand and optimise the design, practices, and engagement that lead to these outcomes.

Koran and Koran (1986) suggested that, in addition to learning, "curiosity, psychomotor development, interest, appreciation, motivation and generalization all could be considered among the desired outcomes of a museum visit" (p. 14). Hooper-Greenhill (2004) identified five generic learning outcomes relevant to cultural institutions, including museums: an increase in knowledge and understanding; an increase in skills; a change in attitudes or values; enjoyment, inspiration, creativity; and action, behaviour, progression. In this conceptualisation, even outcomes that might at first appear to be factual- or content-related are not strictly confined to this. For example, "an increase in knowledge and understanding" encompasses increases in knowing about things like artefacts, places, and subjects, but also about the self and others, and "an increase in skills" encompasses both subject specific skills and social and emotional skills.

With an expanding understanding of the wide-ranging benefits and outcomes of museum visits, researchers and museum professionals are beginning to examine these beyond factual knowledge and content learning. For example, findings suggest that museum visits increase self-beliefs (e.g., science self-efficacy: Gutwill, 2018), inspire attitudes and behaviours (e.g., conservation: Kelly & Skibins, 2021), influence later activities (e.g., children imitating facilitators' behaviours and activities at home: Anderson et al., 2002), and fuel positive feelings (e.g., connectedness: Wilkening Consulting, 2022). Through museum engagement, visitors also learn about themselves and others while deepening interpersonal bonds (Briseño-Garzón & Anderson, 2012; Falk et al., 1986; Leinhardt & Knutson, 2004; Letourneau et al., 2017; Luke et al., 2019). In fact, case studies of fourth grade students on a museum field trip suggest that the primary area of growth for some students is cognitive gains, but for others it is social gains (Rapp, 2005). Moreover, museum visits can support children's development of critical thinking skills, teamwork, and communication (Andre et

al., 2017). Children also express nonexhibit-related enjoyment and learning, such as of architectural features and gift shop prices (Dockett et al., 2011; Falk et al., 1986; Piscitelli & Anderson, 2001).

A growing interest in the museum studies field is that which investigates visitor and societal health and wellbeing (e.g., Falk, 2021), including in child visitors (e.g., Lester et al., 2014). Emphasising the importance and significance to museum visitors of non-factual knowledge benefits, when interviewed after a visit to the Queensland Museum, at least half of adult participants refer to an element of learning (e.g., knowledge, cultural awareness) as an important benefit of visit; however, 59% report on psychological wellbeing and 57% reported restoration outcomes (Packer, 2008). In fact, compared to a plethora of other activities, experience sampling suggests that museum visits have one of the largest positive effects on self-reported happiness (Bryson & MacKerron, 2017), and a majority of both museumgoers and the broader US population believe that museums, including children's museums, support emotional wellbeing (Wilkening Consulting, 2022).

Although a broadening conception of learning is being acknowledged and appreciated across the museum field, this work might be most impactful for children's museums, whose staff report that they are unique from other museum institution types in that they focus less on content learning and more on social/emotional growth and holistic development (Luke & Windleharth, 2013). In fact, the learning that parents believe their children experience through play at the children's museum encompasses far more than content knowledge and facts; it also includes learning how things work and developing social skills (Letourneau et al., 2017). Upon entering a children's museum with their toddler, only 4% of adults reported a visit motivation of child learning and instead reported coming for play and hands-on engagement, a creative place, and to do something new or different; while learning was later reported as a benefit on reflection of the visit, the primary reported benefits were playing and socialising (McInnes & Elpidoforou, 2018). Opportunities and avenues to contribute to children's holistic development have taken a particularly strong hold as a research agenda priority for children's museums. For example, under the name of *Fostering Character Through Children's Museums*, and with the support of a $1 million grant from Lilly Endowment, Inc., the Association of Children's Museums began a multi-year initiative in November 2023 with 23 children's museums in which they will focus on

character traits (e.g., curiosity, gratitude, empathy, kindness) (Association of Children's Museums, n.d.-c).

Museum Learning

It is evident that there are various and varying reasons for visiting a museum, and, further, that a visit is neither always for subject-matter, content, and factual knowledge learning, nor is this learning the most significant motivation or most important outcome. Museum learning can be broadly defined as *a productive personal and internal shift, change, or growth that emerges, at least in part, from or in relation to a museum experience*. This definition encompasses immediate benefits, such as those that occur while directly engaged with the museum (e.g., awe), short-term outcomes (e.g., skill-building), and long-term impacts that are a result of having been to a museum, either arising in relation to a single visit or compounded over multiple visits (e.g., wellbeing). The shift, change, or growth can be a new, deepening, or increasing complexity of awareness, knowledge, beliefs, understandings, and/or competencies that can be cognitive, affective, interpersonal, intrapersonal, physical, behavioural, attitudinal, or any combination of these. The term "productive" clarifies that this change must be meaningfully positive, informed by Dewey's (1938/1997) distinction between educative and mis-educative experiences, as well as his assertion that "the belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative" (p. 25). The specification that such change "emerges, *at least in part*, from or in relation to a museum experience" is made because museum learning is not solely received from the museum as an external source of instruction or information; rather, it is made *personal*, intertwined with the visitor's beliefs, expectations, and personal history. Further, when a memory of the museum visit is sparked and incorporated into later experiences, the museum visit becomes only part of the new learning situation, but a part that prompts and/or significantly contributes towards, or plays *a part* in, new learning that is *related* to the visit but may not occur *during* the visit. Finally, "museum experience" has been used to indicate that while most museum experiences will be the result of a *visit to* a museum, there are increasing ways of outreach that museums are using to extend beyond their walls, which can also lead to learning. Thus, this definition allows flexibility to remain responsive to the possibilities of these trends and emerging engagement strategies.

As a field, we are only beginning to scratch the surface of museum learning. While further work is necessary, it is clear that children's museums are not about rote memorisation or the types of outcomes that can be written on a label and tested for later; instead, they are opening doors of possibility to also support holistic growth, including that of Lifelong Competencies, such as creativity.

Similar but Distinct: Implications

The broad umbrella of "museum" is helpful in many ways, both from institutional planning and visitor anticipation perspectives; however, it is also evident that each type of museum has its own idiosyncrasies that are subsequently reflected in their identity, exhibits, visitors, expectations, and learning. In the divergence from the traditional conceptualisation of "museum", Mayfield (2005) has suggested that "an ongoing issue has been what makes a museum a children's museum and are these truly museums" (p. 181). Therefore, it is important to understand and remain conscious of what makes children's museums distinct from other museum types, particularly in light of perpetuating historical trends of object preservation, elitism, and factual content learning; however, children's museums are, without a doubt, museums.

It is not so much a question, then, of whether children's museums are museums, but rather to what extent museum practices and research findings can be shared across institution types *without question*. That specifications of each museum type show similarities rather than a complete departure is essential, as it means that the wealth of research and evaluation in other types of museums can, to an extent, inform children's museum design and practice, and vice versa. However, that nuances exist between museum types in their design and practices, as well as in visitors' perceptions, engagement, and learning, necessitates thoughtful consideration of such work and its contextualisation, rather than blanket adoption. Without this deeper reflection, there exists a substantial risk of misusing research and detrimentally misguiding design and practice. Thus, it is important to allocate resources to understanding children's museums, yet, despite both identifiable similarities *and differences* between children's learning and the ways that different museum types facilitate this, only 14% of research on child learning in museums has been conducted in *children's museums* (Andre et al., 2017).

Conclusion

Children's museums are compatible with the broader set of museum institutions in their community focus, public engagement, educational activity, mission-driven social impact, enjoyment, non-profit organisation, and their provision of exhibits. Thus, and importantly, many general overlaps do exist. Simultaneously, children's museums are unique from other places in children's lives, including traditional museums. They offer opportunities for playing, exploring, discovering, having fun, and imagining with materials and with others, all set within exhibits designed around developmentally appropriate themes. Further, this engagement offers holistic benefits. That children's museums are not only unique, but uniquely beneficial, means that it is important to provide all communities and all children access to children's museums. Moreover, it is our responsibility to optimise them, such that the outcomes of this access can be maximised. To do this, it is necessary to next examine *how* the elements of a children's museum visit discussed in this chapter merge and interact to create a visitor's experience, and, thus, generate museum learning.

Chapter 3

Understanding and Designing for the Children's Museum Family Visit Experience

Introduction

Museum learning is not only about the outcome(s), but also, "the conditions, the processes, and the engagement that lead to learning" (Barriault & Pearson, 2010, p. 92). Following the discussion of the primary components of a museum visit in Chapter Two, this chapter will discuss *how* a personally meaningful museum visit experience unfolds, as well as its nuances during family visits to children's museums. It will also explore threats of (mis)match to museum learning, theoretical approaches to museum research and practice, and experience design, through which museum professionals can provide opportunities and support for visitors' engagement, interactions, and museum learning.

Experience

Museum learning has been defined as a productive personal and internal shift, change, or growth that emerges, at least in part, from or in relation to a museum *experience* (see section 'Museum Learning' in Chapter Two). Thus, in order to understand and design for museum learning, it is first necessary to define what an experience is and explore how experiences are shaped within informal educational environments, with a specific focus on museums.

Drawing on the conceptualisations by Dewey (1934, 1938/1997), O'Dell (2005), Pine and Gilmore (2020), and Rossman and Duerden (2019), an experience is defined in this work as *a generative engagement between an individual and their environment, from which intangible and personally unique changes arise during a mutually dynamic process that is temporally bound, but which sits subjectively meaningful within, and connects to, the individual's ongoing life journey* (see Figure 3.1). This definition highlights four distinctive components of an experience: engagement, generativity, individuality, and time.

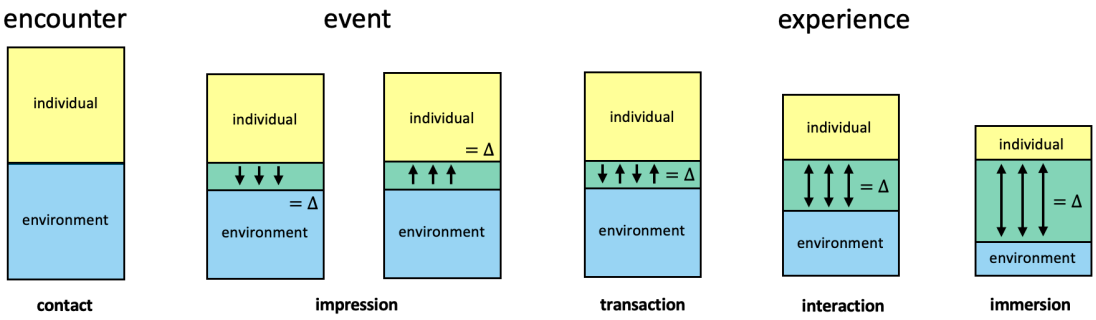
Engagement

The core element of an experience is engagement, which necessitates active participation (e.g., attention, involvement) of an individual with their immediate environment. The environment includes physical, social, psychological, and culturally constructed elements and influences. As a result, an individual's engagement with their environment can manifest as one or more of a variety of types, such as emotional, physical,

intellectual, and spiritual (Pine & Gilmore, 2020). The engagement is represented in Figure 3.1 by the overlap of the individual and their environment, shown in green. If there is no overlap, the passivity of simply meeting is an encounter rather than an experience (see Figure 3.1). Dewey (1934, 1938/1997) has, at different points, described an experience as a transaction and an interaction between an individual and their environment, while Pine and Gilmore (2020) and Rossman and Duerden (2019) characterise experiences as immersive. Though little distinction has been made in the literature, the type(s) of engagement, as well as the number and degree of engaged aspects, as represented by the extent of overlap, determine how absorbed the individual is and, thus, whether the engagement is a transactional, interactional, or immersive experience.

Figure 3.1

Differences in Individual-Environment Engagement and Generativity



Note. Δ = change.

Generativity

That an experience is generative necessitates that the engagement produces change (denoted by the delta symbol, Δ, in Figure 3.1), and, consequently, that experiences are not habitual occurrences. The change generated must be, at least in part, intangible and internal to the individual (i.e., personal or self-reflective development) (e.g., thoughts, emotions, attitudes, behaviours: Rossman & Duerden, 2019). The variety of changes that could unfold reflect the variety of environments and engagement types (see section 'Engagement' above). In addition, that the change lies at the engagement, or overlap, of the individual and their environment indicates that

> Experience does not go on simply inside a person. It does go on there, for it influences the formation of attitudes of desire and purpose. But this is not the whole of the story. Every genuine experience has an active side which changes in some degree the objective conditions under which experiences are had. (Dewey, 1938/1997, p. 39)

As a result, experiences have a mutually dynamic, but not necessarily equal, (re)defining power, or reciprocity (e.g., Dewey, 1934, 1938/1997; Rossman & Duerden, 2019). As depicted in Figure 3.1, when there is engagement but only the individual *or* the environment actively exerts influence on the other, which in turn becomes the only element to change, this is instead an event that results in an impression being left. Further contrasting these, and emphasising the intangible and internal change of an experience, Lupton (2017) writes that "during an experience, users create meanings and associations that become more important than the event itself" (p. 66).

Individuality

Due to their engagement with the environment, experiences do not happen *to* the individual but rather are interdependent, such that they depend *on* the individual. As a result, "the self acts as well as undergoes, and its undergoings are not impressions stamped upon an inert wax but depend upon the way the organism reacts and responds. . . . The organism is a force, not a transparency" (Dewey, 1934, p. 246). The inclusion of the active individual as a crucial factor and the emphasis on "personally unique changes" that are "subjectively meaningful" indicate that the engagement is also influenced by an individual's personal history and idiosyncrasies, such that an experience can only be understood in terms of who one is and what they bring with them to the environment. This means that not only are no two experiences alike, but an element of unpredictability in engagement and generativity is introduced, even to designed experiences.

Spans of Time

The definition of experience also includes two spans of time: (1) a process over the temporally bound period of engagement and (2) an individual's life as a longer continuity of being and doing that this engagement is set within. Firstly, that an experience is defined by engagement and generativity indicates that an experience is not static but instead necessitates a process that must unfold *over time.* The repeating arrows in Figure 3.1 signify this passage of time. However, this process is also temporally contained, or bound by the

specific period in which the individual is engaged with(in) a particular environment. Secondly, the definition of experience illustrates that each experience is set within, and connected to, life as longer view. In fact, "the *effect* of an experience is not borne on its face. . . . Wholly independent of desire or intent, every experience lives on in further experiences" (Dewey, 1938/1997, p. 27, emphasis in original). That the generativity from engagement endures shows that an experience leaves not only a personal change, but also a memorable footprint. However, the saliency and impact of an experience can change over time (e.g., Rossman & Duerden, 2019). Therefore, only when these two spans of time are considered in tandem can the value and depth of an experience for an individual be truly understood.

Rossman and Duerden's (2019) conceptualisations of the microexperience and the macroexperience can be used to illustrate these two spans of time, where "microexperiences are discrete interactional episodes across the anticipation, participation, and reflection phases that together constitute the cumulative macroexperience" (Rossman & Duerden, 2019, p. 10). Applied to the present definition of an experience, the macroexperience is used to capture how the temporally bound microexperience of engagement sits within the individual's life journey.

Modelling the Experiential Overlap: Factors, Form, and Function

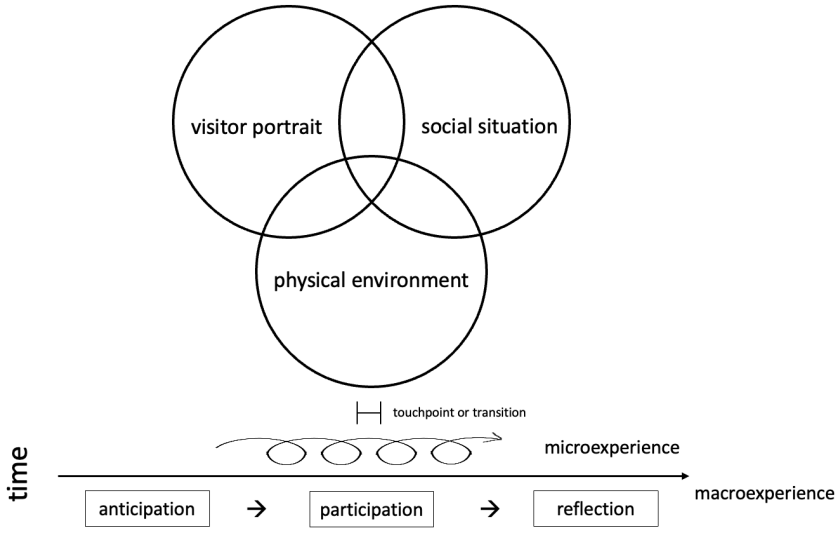
To capture the contributing variables of both the individual and their environment, which together create a museum visit experience, this work will draw upon, refine, and extend the Contextual Model of Learning (CML) proposed by Falk and Dierking (2000, 2013). According to the CML, the museum visit experience, and thus any museum learning that could emerge from it, lie at the intersection of three contexts: a visitor's personal context, their sociocultural context, and the physical context of the museum and its exhibits. As a fourth factor, the CML includes the dimension of time, which captures that a museum visit and the contexts that constitute it are dynamic across the length of the visit *and* that each visit is not isolated, but rather lies amidst what has come before and will come after it. This acknowledges that visitors' personal histories and visit motivations contribute to their personal context and that museum learning outcomes can emerge *after* the visit.

The modified model proposed here is titled the *Informal Educational Environment Visitor Experiencescape* (referred to hereafter as the *Visitor Experiencescape*) (see Figure 3.2). Whereas the term "contextual" implies a relatively static, one-way influence of a

descriptive container within which something happens to the individual, “experience” captures an interdependent and dynamic engagement of an individual with their environment. Thus, the concept of experiencescapes, or “stylized landscapes that are strategically planned, laid out and designed” (O'Dell, 2005, p. 16), is used to represent an individual’s engagement with a designed environment. Despite being likened to a landscape, an experiencescape is more intentional and encompassing than a “setting”, including elements such as people, place, objects, rules, relationships, and blocking (Rossman & Duerden, 2019). The focus on the “*visitor* experiencescape” indicates that this model represents the end-user’s perspective. This is essential, as it denotes that there is no single, predictive model that represents all visitors; instead, each visitor’s experience is subjective and can be understood as such through this model. This model also moves away from being called a “model of learning” to that of an “experiencescape” because the change that occurs from an experience may not always be educative (Dewey, 1938/1997), and it is important to be able to adequately capture experiences without the assumption or requirement of learning, as exploring those that do not result in learning could be just as, if not more, informative. Finally, while it will be discussed in relation to museum visits in the present work, as the name highlights, this is not a museum-specific model. As a result, the Visitor Experiencescape holds promising applicability and usefulness for understanding other informal educational environments (see Chapter One).

Figure 3.2

The Informal Educational Environment Visitor Experiencescape (the Visitor Experiencescape)



The Visitor Experiencescape retains the three-factor structure of the CML but, as discussed next, refines and renames the factors as the visitor portrait, social situation, and physical environment. The form of an overlapping intersection of the three factors is retained to represent that the factors function interdependently. The conceptualisation of time in the CML is extended to explicitly account for both the microexperience of museum engagement *and* the macroexperience of an individual's life that each visit is set within.

Visitor Experiencescape: Visitor Portrait

Though sociodemographic measures have been a focus of visitor studies, a wealth of evidence suggests that intraindividual cognitive and conative-affective variables (e.g., prior knowledge, interests, values, visit motivations and expectations, concept of self, goals) better explain individuals' museum visitation habits, engagement behaviours, and visit outcomes (Falk, 2004; Falk et al., 2007; Hood, 1983/2007). The personal context of the CML acknowledges that *every* museum visitor is unique, and the impact of any visit can vary with a multitude of personal characteristics and individual differences, including visitors' visit motivation, expectations, and goals; museum experience, literacy, and familiarity; developmental level, prior knowledge, interests, beliefs, attitudes, and values; visit choice and control; preferred ways of learning; and their notion of museums situated within family practice and society (Falk & Dierking, 2000, 2013).

In the Visitor Experiencescape, the "personal context" of the CML has been modified and relabelled the "visitor portrait". The term "visitor" rather than "personal" emphasises that the model can be applied to two levels: (1) focusing on the experience of an individual visitor, whether alone or within a group, and (2) representing a full visiting group as a cohesive unit of interest. It is necessary to acknowledge that individuals and visiting groups are distinct forms of "visitor", while also retaining a model and language that can capture both, as group museum visits are simultaneously personally interpreted and mutually orchestrated. In fact, visiting group practices and resources, which can only be understood when considering the visiting group and its dynamics as a single unit with their own shared history, significantly influence museum visits and learning (Ellenbogen, 2002; Ellenbogen et al., 2004; Leinhardt & Knutson, 2004; Moussouri, 2024). As a result, modelling several individual, or personal, experiences concurrently but separately may not fully capture the group visitor, thereby overlooking significant information about the distinct ways in which group members function reciprocally and interdependently when examined together (e.g.,

family visits: the intermediate step of targeting the parents to ultimately influence change at the child level). On the other hand, individual visitors, even within a single visiting group, differ along some dimensions and, thus, have unique experiences that contribute towards differing museum learning outcomes (e.g., family visits: developmental level of the child versus their caregiver).

The use of the term "portrait" instead of "context" represents that an individual brings the whole of who they are as a lens through which they filter and make sense of their experience, rather than a pre-defined context in which the experience occurs. An important benefit of this change in terminology is that while the term "context" suggests that these are stable variables a visitor enters the museum with, "portrait" is more flexible and, consequently, holistic. Thus, the visitor portrait encompasses stable variables, or those that do not change over the length of a single visit but could change *between* visits (e.g., sociodemographics, prior knowledge, museum visit experience), *and* situational variables, or those that change *during* a museum engagement (e.g., motivation, emotion, interest, perspective).

The primary refinement in capturing the visitor in the Visitor Experiencescape from the CML is that a visitor's cultural background and a visiting group's family practices are included in the visitor portrait. This is because a visitor's cultural background tends to be a significant informant for many of the variables of the visitor portrait (e.g., prior museum visitation: Swan, 2014; Weiland, 2015) and is more internal than external, such as social and physical variables (see below).

The *visitor portrait* captures stable and situational factors that describe visitors, including their sociodemographic profiles; personal history and prior experiences; intraindividual cognitive variables (e.g., background knowledge); museum visitation perceptions, expectations, and beliefs; individual identity and worldview; performance variables (e.g., skills, (dis)abilities, developmental level); learning styles and beliefs; intraindividual conative-affective variables (e.g., motivation, emotion, interest); and visiting group resources and practices.

Visitor Experiencescape: Social Situation

Informal learning unfolds with others (Diamond, 1999), "all human experience is ultimately social" (Dewey, 1938/1997, p. 38), and the museum is a socially mediated space (Leinhardt & Knutson, 2004). While the sociocultural context of the CML includes variables

of both a visitor's cultural background and cultural milieu (e.g., race-ethnicity, county of origin, customs, values, language, beliefs) *and* their social interactions that occur during the museum visit (e.g., who an individual visits with, who they interact with, who else is present) (Falk & Dierking, 2000, 2013), the social situation of the Visitor Experiencescape has been refined to reflect the latter set of variables, with the former considered part of the visitor portrait (see section 'Visitor Experiencescape: Visitor Portrait' above). As such, the term "social" is used rather than "sociocultural". Furthermore, the social situation is limited to social interaction or attention (e.g., observation). This means that, without any type of engagement, the passive presence of other visitors would be considered a spatial encounter variable (e.g., whether the museum is crowded) and part of the physical environment (see section 'Visitor Experiencescape: Physical Environment' below). As a result, the term "situation" is used rather than "environment" to indicate a focus on proximal interactions and not more distal social influences, such as the broader environmental impacts of others.

Who an individual visits a museum with not only informs their motivation(s) to visit (e.g., Hooper-Greenhill, 1994; Phelan et al., 2020), but also influences their engagement, conversations, and behaviours (e.g., Bitgood et al., 1993; Heuken et al., 2021). Moreover, evidence suggests that museum experiences and, thus, outcomes are shaped by interactions with various social partners during the visit, including museum facilitators (e.g., Borun & Dristas, 1997; Kopczak et al., 2015; Rosenthal & Blankman-Hetrick, 2002), family members (e.g., Crowley et al., 2001; Hedrick et al., 2009; Tessler & Nelson, 1994), within-visiting group peers (e.g., Dicks, 2013; Shaby et al., 2017), and other visitors who are outside of an individual's visiting group (e.g., Gutwill, 2018; Leinhardt & Knutson, 2004). The term "situation" is used instead of "context" to reflect the variability of these interactions, including differences in interactional patterns and partners across a visit and between visitors. For instance, larger visiting groups tend to divide organically and then come back together throughout the course of a visit, with a greater tendency to interact and have exhibit-focused conversations in pairs (Allen, 2002; Ash, 2003; Price et al., 2022; Vishkaie et al., 2021).

The social situation is also determined by museum-specific rules, social norms, and the visitor behaviours that arise while navigating these. For instance, evidence suggests that art museum visitors engage and discuss amongst themselves more when photos are not permitted (Christiansen, 2018). Moreover, while parents believe it is their job to keep tabs

on and direct their children's behaviour in the museum (Briseño-Garzón & Anderson, 2012), there is often misunderstanding, coupled with a lack of communication from the museum, that leads to uncertainty and overcompensation, which can inadvertently restrict children's exploratory behaviours (Archer et al., 2016; Carpenter, 2018). Further, evidence suggests that parents do not engage as deeply in their child's play in museum settings than at home, potentially as a result of feeling less comfortable in the social situation created by public settings (Shine & Acosta, 2000).

The *social situation* captures the interpersonal variables that are specific to museum engagement, including who an individual visits with and who they interact with during their visit, as well as the social norms and rules that influence situation-specific feelings and observable behaviours during their visit.

Visitor Experiencescape: Physical Environment

According to the CML, the physical context is the setting in which visitors enter, including the artefacts and objects of a museum's exhibits, the architecture and design of the museum, interpretive materials (e.g., labels, media, brochures, advance organisers), and the "feel" or ambiance of the space (e.g., smell) (Falk & Dierking, 2000, 2013).

A wealth of evidence suggests that differences in museum exhibits' physical design (e.g., static/concrete presentation, degree of interactivity, indoor/outdoor, small/large) influence visitors' attention, engagement, interaction, learning, and memory (e.g., Allen, 2002; Anderson et al., 2002; Boisvert & Slez, 1995; Borun & Dristas, 1997; Caporaso et al., 2022; Cohen, 1987; Serrell, 1997; Weisberg et al., 2023). Additionally, a review of literature on children's learning in various museum types suggests that technology is a particularly important experience facilitator (Andre et al., 2017)—emerging evidence suggests that technology can increase exhibit holding time, spur deeper engagement, increase child motivation, and support caregiver scaffolding (de La Ville et al., 2021; Li et al., 2020; Price et al., 2022). It is not only the presence of physical environmental elements that matters, but also their *presentation* and *implementation*. For instance, *movable* seating encourages adult interaction with younger children (Gaskins, 2008), and digital-only exhibits are not as effective or engaging as when technology is utilised as only one part of mixed reality exhibits (Vishkaie et al., 2021). Furthermore, beyond simply having object labels and signage, the content, tone, design, and appearance of the text matters (Dean, 1994), as well as their placement and density (Loomis, 1987).

In addition to exhibit design and materials, elements of the broader museum space, including the floorplan, its layout, and its designed cues (e.g., wall partitions, ropes, lighting), contribute to the visitor experience, such as by orienting visitors or directing their choices and the flow of their visit (Dean, 1994; Loomis, 1987). The physical environment also encompasses other visitors occupying the space and the ways in which they become part of an individual's fluctuating but unpredictable environment (e.g., crowding: Briseño-Garzón et al., 2007b; Leinhardt & Knutson, 2004). Many exhibit engagements are brief (e.g., Diamond, 1986; Dicks, 2013; Serrell, 1997), and a notable portion of the museum visit is not spent in the exhibit spaces themselves (Gaskins, 2008; Hein, 1998), but rather in the "spaces-in-between" (Hackett et al., 2018). As such, the physical environment includes general museum features that contribute to the visit experience, such as non-exhibit architectural structures (e.g., stairs, railings: Dockett et al., 2011) and support facilities (e.g., bathrooms, cafés, gift shops: Bitgood, 1994; Moussouri, 2024).

Elements of the physical world, such as the décor, ambiance, and architectural features, can influence an individual's mood and emotional experience (Lee, 2018). Thus, though exhibit materials and displays are central to museum experiences, the physical environment is also *sensed.* In fact, evidence suggests that museum exhibits lead to a high activation of children's senses (e.g., Dicks, 2013). Considering these variables reflects expanding practices and a growing body of work examining multi-sensory additions (e.g., to touch, to smell, to listen) to museum exhibits (e.g., Davidson et al., 1994; Kucirkova & Gausel, 2023). Alongside tangible elements, their placement, and their spatial relatedness, intangible museum aspects contribute to the experience (e.g., ambiance: sound, lighting; aesthetics: colour: Leinhardt & Knutson, 2004). For instance, the high noise levels of large, interactive exhibit halls may impede family conversation (Archer et al., 2016). As a result, the term "environment" has been chosen as it is broader and more inclusive than "context", signifying the physical built setting *and* its sensory conditions.

Falk and Dierking (2013) conceptualise the physical context to extend to visitors' relevant physical engagements before and after the museum visit itself, such as with books, magazines, and websites. However, in the Visitor Experiencescape, the physical environment is limited to the immediate and temporally bound museum experience, or the dynamic in-museum microexperience, and pre- and post-visit elements instead factor into

the macroexperience as anticipation and reflection (see section 'Visitor Experiencescape: Time' below).

The *physical environment* encompasses exhibits' physical design (e.g., style, size, materials, presentation), the implementation of technology, broader physical museum features (e.g., layout, architectural structures, support facilities), the presence of others in the space and their influence (e.g., crowding or noise), and the intangible environmental elements and conditions that contribute towards the perceived ambiance and aesthetics.

Triadic Intersection

Investigating a range of variables that encompassed the personal, sociocultural, and physical contexts of the CML, Falk and Storksdieck (2005) concluded that each variable significantly influences museum learning in at least some visitors, but, more importantly, that the influence of each differs across visitor characteristics and that each only explains a small variance in learning. As a result, the form of the overlapping triadic intersection of the three factors from the CML is retained in the Visitor Experiencescape to explain how the factors function together, illustrating that the museum experience can only be fully understood by considering all three. In this way, the Visitor Experiencescape represents the engaged overlap between the individual and their environment (see section 'Engagement' above), where a mutually dynamic and reciprocal process of (re)redefinition unfolds between the visitor portrait, the social situation, and the physical environment (see section 'Generativity' above) to create a visitor's personal museum experience (see section 'Individuality' above).

Visitor Experiencescape: Time

Though some museum experience variables are stable over the course of a museum visit (e.g., age, prior museum experience, background knowledge), others are situational and subject to change during a single visit (e.g., attention, interest, motivation, emotion). While both shape the museum visit and visitor outcomes, little research to date has clarified the difference. For example, museum motivation includes "personal characteristics that visitors bring with them to the visit . . . and the situational characteristics that they find in the setting itself" (Packer & Ballantyne, 2002, p. 185). However, the prolific work on motivation (see section 'Motivation' in Chapter Two) has primarily focused on understanding visitors' motivation(s) to visit the museum in the first instance, and there is much less known about the motivation to engage *during* the visit (Hohenstein & Moussouri,

2017), despite evidence that motivation "is shaped by the visit itself" (Leinhardt & Knutson, 2004, p. 53). This could be a result of models that do not explicitly necessitate the consideration of both spans of time.

Given the two spans of time that define an experience as (1) temporally bound and (2) situated within the continuity of an individual's life (see section 'Spans of Time' above), a complete understanding of informal educational environment experiences, including museum visits, necessitates a deep focus (i.e., microexperience) *and* a wide lens (i.e., macroexperience). Thus, rather than simply acknowledging the dimension of time, an imperative extension of the Visitor Experiencescape from the CML is the explicit inclusion of both the microexperience, in which there is continuous (re)definition, and the macroexperience, or the longer arc within which the microexperience is set.

Microexperience

As represented by their triadic intersection, each of the factors explored above is not only "continuously constructed by the visitor" (Falk & Dierking, 2013, p. 29), but they also function interdependently, such that they (re)define and (re)determine each other *during* engagement and across the museum visit. In fact, experiences are revealed over time (Pine & Gilmore, 2020), and visitors' wants and needs shift over the course of their visit (e.g., Loomis, 1987). For instance, while some aspects of visitors' agendas persist from museum entry throughout their experience, others can fluctuate in response to on-site factors (e.g., fascination, confusion, curiosity, fatigue, developing interests, crowdedness, exhibit content, presentation of museum material) (Briseño-Garzón et al., 2007b; Leinhardt & Knutson, 2004). The situational emotions that arise in response to exhibits and the museum environment contribute towards visitor engagement, effort, learning, and memory (e.g., awe: Price et al., 2021; fear: Falk & Gillespie, 2009; frustration: Borun & Dristas, 1997).

Highlighting the importance of the microexperience, during nature centre walks, families who went on longer walks reduced both their on-topic social engagement (i.e., fewer science reasoning conversations) and physical engagement (i.e., less use of magnifiers) (Zimmerman et al., 2013). In fact, attention and engagement decline over the course of a museum visit, particularly after 30 minutes (Dean, 1994; Hein, 1998). However, though longer exhibit engagement may make museum learning more likely (e.g., Puchner et al., 2001), time does not always predict learning (e.g., Sanford, 2010). Therefore, it is not merely about how long the microexperience lasts, but also what happens during

engagement, which variables are at play, how (much) they interact, and the ways in which they (re)define each other. For example, evidence suggests that "only half of the increase in performance indicators is explained by the increase in time; the rest is explained by other factors, such as increased involvement with the exhibit" (Borun et al., 1997, p. 287). Nonetheless, time can and does interact with and contribute towards such involvement. For instance, although joint attention and who leads during family museum visits (i.e., parent, child, equally distributed) shift across time and in response to exhibits and their activities, evidence suggests that parents become less engaged with their child(ren) over time (Briseño-Garzón et al., 2007b; Jung et al., 2023; Price et al., 2022).

Museum visits are often examined at two different scopes: (1) limited to an exhibit of interest for episodic investigation or (2) inclusive of the entire museum visit. As the concept of the microexperience can be used to represent various timespans (Rossman & Duerden, 2019), it is necessary to clarify that, while the Visitor Experiencescape could be adapted, in the present application, the microexperience is considered at the level of a single complete visit in order to comprehensively capture a visitor's dynamic engagement and its influences within and across the museum itself. The microexperience is depicted in Figure 3.2 as a coil. This form is used to represent that, as the microexperience unfolds, the factors are productively self-referential and function continuously through interaction, such that they perpetually (re)define each other while also contributing to propelling the visit forward, including in emergent but unpredictable ways (e.g., shifting visitors' perspectives). Within the microexperience as it is defined here, the engagement that occurs at each exhibit *and* in the spaces-in-between serve as smaller units that inform the museum visit. While Rossman and Duerden (2019) view each microexperience as a touchpoint, when the span of the microexperience is the full museum visit, a touchpoint can be used to indicate a shorter unit of exhibit engagement that occurs within the visit, and a transition as the space between each touchpoint.

Due to its emergent nature, the microexperience is especially important for capturing situational variables (e.g., emotion, interest, motivation) and understanding engagement-based museum learning (e.g., Lifelong Competencies). As such, its explicit inclusion in the Visitor Experiencescape plays a critical role in exploring visitors' museum engagement and museum learning. This becomes especially relevant when considering the

broadening conception of museum learning, which may be particularly impactful for children's museums (see section 'Why?' in Chapter Two).

Macroexperience

Though temporally bound, the microexperience of a single visit is not isolated. Instead, it lies amidst and connected to what has come before and will come after it (see section 'Spans of Time' above)—not only does a visitor's past contribute to their experience (see section 'Visitor Experiencescape: Visitor Portrait' above), but also ideas may take time to be newly conceptualised or may be stored, such that insights related to a museum visit can emerge *after* the visit (Bell et al., 2009; Diamond et al., 2016; Falk & Dierking, 2000, 2013; Hein, 1998) (see section 'Museum Learning' in Chapter Two). In this way, a museum visit's ability to bring about learning begins *before* the visitor arrives and carries into their reflections and experiences *after* they have left (Black, 2018; Falk & Dierking, 2013; Falk & Storksdieck, 2005; Phelan et al., 2020). For instance, learning "always has a previous history" (Vygotsky, 1978, p. 84), such that prior knowledge contributes to the museum experience (e.g., see section 'Visitor Experiencescape: Visitor Portrait' above), and evidence suggests that those with greater prior knowledge may experience greater content-related learning gains (Falk et al., 1986). Additionally, museum experiences are memorable, and visitors recall elements of their visits and retain learning over time (e.g., Hein, 1998; Falk et al., 2007). However, evidence suggests that the impact of a museum engagement can change over time by lessening *or* increasing (Diamond et al., 2016; Falk, 2006; Gutwill, 2018; Kelly & Skibins, 2021). Consequently, considering the macroexperience is critical in understanding not only immediate outcomes, but long-term impacts (see section 'Museum Learning' in Chapter Two).

Museum experiences are shaped by museum visitation habits and site familiarity developed from prior visits (Falk & Dierking, 2000; Leinhardt & Knutson, 2004). For instance, individuals who visit museums more frequently have greater museum literacy, better understand the museum code, are more comfortable during their visits, and report having more satisfying experiences (Hood, 1983/2007; Loomis, 1987; Pekarik et al., 1999). Additionally, families who have previously visited a specific museum have a more focused agenda and visit strategy during repeat visits (Briseño-Garzón et al., 2007b), and visitors who have previously engaged with a particular exhibit space are more selective, choosing deeper engagement with stations that are most aligned with their personal interests, as

evidenced by longer interactions at fewer stations (Heuken et al., 2021). Therefore, another crucial contribution of the macroexperience is that it can capture visitors' prior museum experiences, both whether they have learned how to learn in museums generally and whether they have previously visited a particular museum or exhibit.

The Visitor Experiencescape extends the CML with Rossman and Duerden's (2019) conceptualisation of the multiphased macroexperience, in which each experience in an informal educational environment is preceded by an anticipation phase, occurs during a participation phase, and is followed by a reflection phase. The sequential phase-based macroexperience is represented linearly in Figure 3.2 as beginning before and extending beyond the in-museum participatory microexperience, illustrating how it informs and is informed by museum engagement. Demonstrating differences between these phases, and, thus, the importance of accounting for each, evidence shows that conversations during exhibit engagement differ from reflection conversations (e.g., Leinhardt & Knutson, 2004; Moussouri, 2024) and that parent beliefs about children's museum visit benefits change from pre- to post-visit (McInnes & Elpidoforou, 2018). Additionally, parental and child pre-knowledge moderates parent-child museum conversations and inquiry behaviours (Acosta et al., 2021; Eberbach & Crowley, 2017; Franse et al., 2020), and exhibits that connect to past experiences or everyday life are more meaningful for children and adults (Moussouri, 2024; Piscitelli & Anderson, 2001). Finally, over time, the reflection phase can inform a new museum anticipation phase. For instance, children who have visited a museum before believe museums are a place for learning significantly more than children who have not visited before, *and* they hold a more positive attitude towards museums (e.g., exciting and happy place) (Piscitelli & Anderson, 2001). Positive museum experiences and memories, in turn, lead to future museum experiences (e.g., The Museum Experience Cycle: Falk, 2021). The explicit inclusion of the macroexperience in the Visitor Experiencescape is essential in comprehensively understanding how museum visits are situated in individuals' lives, as well as how their ongoing life journey informs and is informed by each specific museum visit (i.e., microexperience).

A Focus on Family Visits

As indicated by the social situation of the Visitor Experiencescape, *who* children visit a museum with affects their experience. Compared to organised museum outings, such as field trips, family visits are more voluntary and less structured (Loomis, 1987; Rennie &

Johnston, 2004), which permits children greater freedom to lead the engagement and follow their interests. Not only do children prefer family visits to those with their school classes (Haas, 1996; Jensen, 1994), but they also behave differently (Hein, 1998). Evidence suggests that the educational effects of family visits are greater than those of class visits (Tan et al., 2021). As a distinct visiting group with its own intricacies, resources, practices, interactional patterns, and engagement styles, and to mitigate the influence of confounding factors, this work will focus on family visits.

"Family" is defined here as a multigenerational group (i.e., at least two individuals) that includes at least one child, and in which individuals have a sustained relationship. This "does not require a biological relationship but does require a shared history" (Foutz & Emmons, 2017, p. 180). Though many family visiting groups are comprised of children and their parents, the term "caregiver" is used to remain sensitive to different family compositions. In this work, caregiver will inclusively refer to any adult visiting with a child with whom a sustained relationship exists (e.g., parent, grandparent, guardian).

Family Resources

Emphasising the benefits of established relationships, Bronfenbrenner (1979) hypothesised the following:

> The developmental potential of a setting in a mesosystem is enhanced if the person's initial transition into that setting is not made alone, that is, if he enters the new setting in the company of one or more persons with whom he has participated in prior settings. (p. 211)

Families bring a shared history, knowledge of each other, and family practices (e.g., strategies for learning together) to the museum, which shape their visits (e.g., Briseño-Garzón et al., 2007; Falk & Dierking, 2013; Moussouri, 2024; see section 'Visitor Experiencescape: Visitor Portrait' above) and "influence the ways they interpret and make meaning of their museum experience" (Ellenbogen et al., 2004, p. S53). For instance, families use their shared history of past experiences and prior knowledge to make sense of difficult or abstract concepts (e.g., Rogoff et al., 2016; Valle & Callanan, 2006). For example, parents make connections between concrete shared memories (e.g., family vacations) and abstract or complicated museum concepts (e.g., biology) to support children's understanding of them (Zimmerman et al., 2009). With knowledge of each other and a shared history to draw from and build on, family museum visits are rich and meaningful.

Roles

While some have argued that the visiting group should be the unit of inquiry and analysis in visitor studies research (e.g., Astor-Jack et al., 2007), the group museum experience must also be considered at the individual level, as every visiting group experience is simultaneously unique for each individual within that group (see section 'Visitor Experiencescape: Visitor Portrait' above). Thus, while families are each their own unique learning systems, each actor plays their own role; as indicated by the considerations of the social situation, this role is influenced by, and influences, other members of the family group (see section 'Visitor Experiencescape: Social Situation' above). Defined by Bronfenbrenner (1979), "a *role* is a set of activities and relations expected of a person occupying a particular position in society, and of others in relation to the person" (p. 85, emphasis in original), and "different kinds of settings give rise to distinctive patterns of role, activity, and relation for persons who become participants in these settings" (p. 109). The "child" and "caregiver" roles in a family museum visit are distinct, and there are fundamental patterns that reflect the child's visit versus their caregiver's, including differences in their behaviours and learning. Therefore, to more comprehensively understand family museum visits, it is necessary that research and practice consider the family group level *and* tease apart child and caregiver visitors from their visiting group to recognise their individual yet interdependent experiences.

Museum Behaviours

Museums often rely on museum professionals (e.g., docents, facilitators, explainers, demonstrators) to serve as "mediators, translators and message keepers" (Ash & Lombana, 2013, p. 70). However, family visits are unique because caregivers can step in as "scaffolders", "explainers", or "teachers" (Crowley et al., 2001; Ellenbogen, 2002; Gaskins, 2008), mediating between the museum and their children. The mediating behaviours that caregivers enact could be because adults visiting museums with children tend to be particularly motivated to visit *for* their child's benefit and to support their learning (e.g., Hooper-Greenhill, 2004; Phelan et al., 2020). In fact, evidence suggests that caregivers do tend to take on supporting roles, such as guiding museum activities, encouraging interaction and engagement, giving directives, offering help, and facilitating learning, whereas children are more likely to interact with and *do* the activity (Jung et al., 2023; Price et al., 2022). As such, adult-child museum interactions differ substantially depending on whether they are

led by the child or adult (e.g., Dooley & Welch, 2014). These role differences are further evidenced by how frequently children and adults perform certain behaviours. When interacting with exhibits, some behaviours are similar between children and their caregivers (e.g., asking questions), whereas others are not (e.g., children manipulate physical elements alone more, caregivers read signs and labels and show or tell more) (Diamond, 1986). In addition, adults tend not to interact with children's museum exhibit materials (Braswell, 2012), despite that interactive materials are a defining feature of the children's museum and children's engagement (see section 'What?' in Chapter Two; see section 'Where?' in Chapter Two).

Museum Learning

To maximise opportunities for museum learning, museum professionals have already developed different strategies to target children and the "high-energy, noisy" way in which they engage with and experience museums versus the "quiet and discrete" way adults do (Carter, 2017). In fact, the emergence of the children's museum itself is an acknowledgement that children and adults have different ways of learning (Enseki, 2007). However, even within the children's museum, children engage more through hands-on interactions than adults, who tend to engage cognitively before physically (Vishkaie et al., 2021). Resulting from their distinct engagement types, not only are visitor behaviours different by role, but so is museum learning. Of particular interest is that, by entering interactive exhibits in children's museums, the child becomes, for the duration of their engagement, part of the exhibit from the perspective of the caregiver. As such, caregivers' museum learning uniquely includes learning about their children through observation (e.g., personality, learning strategies, behaviours, character development) and developing skills to responsively support their children and how they learn (Briseño-Garzón et al., 2007a; Henderson & Atencio, 2007; Letourneau, Culp, & Wells, 2021; Luke et al., 2019). This further supports that to fully understand the outcomes of a family museum visit, children's and caregivers' experiences need to be considered jointly *and* individually.

(Mis)match

As represented in the Visitor Experiencescape, the same museum environment is experienced as a different space by each visitor. When there is mismatch between an individual and their environment, an experience is less productive than it could be. Development and growth are not only affected by an individual's experience of their

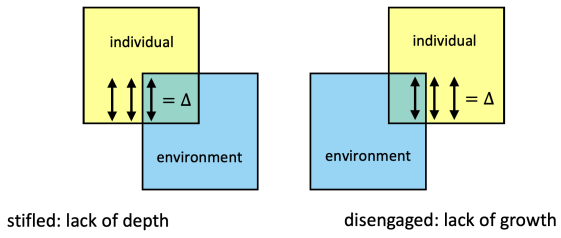
immediate settings, but also by the mutual influence of the environment and individual on each other, the relationships within these settings, and the broader contexts that surround and exert influence on them (Bronfenbrenner, 1979). As such, mismatch in the museum can arise in two ways: (1) proximally through misalignment of perceptions, expectations, beliefs, and behaviours and (2) distally through tensions arising from power and equity.

Misalignment across the various stakeholders of a visit and/or tension between the diversity of visitors and the museum could impede visitors' engagement with even the most thoughtfully designed exhibits and experiences, such that an opportunity is less generative than its potential (see Figure 3.3). Thus, the holistic benefits children's museums *could* champion might be suffering from current lost in translation limitations, and it becomes essential to consider, understand, and strive towards resolving these. In fact, as O'Neill (2006) writes:

> people differ profoundly in how they see and understand the world. The complexity of this range of difference is one of the most challenging realities involved in the task of creating an overarching museum epistemology. The opposite extreme—that people differ so much that it is not possible to vary provision to take difference into account—is equally fallacious and is also an excuse for inaction. (p. 106)

Figure 3.3

Impact of Individual-Environment Mismatch on an Experience



(Mis)alignment

Prior research has found that "the aims of the institutions and their audiences are not necessarily or always congruent" (Noy, 2021, p. 53), and "museum staff expectations for their visitors do not necessarily match the reasons why people come to museums nor what the visitors say they get out of their visits" (Hein, 1998, p. 127). As a result, the various stakeholders that influence, shape, and participate in a children's museum family visit (e.g.,

museum professionals, parents, children) could, at times, be talking past each other. In fact, evidence suggests that museum professionals, caregivers, and children each have different beliefs about family visit interactions (Dooley & Welch, 2014). While stakeholder misalignments have been identified and acknowledged across the field, without understanding and resolving these, museum learning could be stifled and/or visitors may disengage, forgoing the opportunity for learning altogether (see Figure 3.3).

Influenced by variables of the visitor portrait and (inter)acting within the free-choice museum environment, self-directed visitors engage with the same exhibits, materials, and concepts differently. Consequently, while *museum professionals* might "intend for", "anticipate", "expect", or "influence" certain outcomes, these cannot be "required" or "controlled"; instead, museum learning is partly determined by visitors themselves, including their agendas, approaches to learning, and personal histories (Doering, 1999; Falk et al., 1986; Hooper-Greenhill, 2004). That experiences depend on both the individual and their environment introduces the potential for misalignment. In fact, "despite the overall view of "ideal" informal learning in museums from the designers' perspective . . . families vary in their goals and ways of participating" (Rogoff et al., 2016, p. 387). For example, though "curators and exhibition designers continue to use signage, lighting, sound, barriers, and distinctive landmarks to compel visitors to follow a linear narrative" (Lupton, 2017, p. 30), children and families do not always take the anticipated route through exhibits, and this, in turn, alters their experiences (Kucirkova & Gausel, 2023; Vishkaie et al., 2021).

Caregiver beliefs about the value of museum exhibits may differ from their intended goals (Snow-Dockser, 1987). Even though the belief that children learn through play and interactivity during museum visits is shared by museum professionals and caregivers (Luke & Windleharth, 2013; Schauble et al., 2002), caregivers do not always understand an exhibit's intent and, therefore, are unable to support and deepen their children's engagement (e.g., Lewin, 1989). Moreover, caregivers have their own theories about the nature of learning at museum exhibits, their children's learning, and their role in it (Gaskins, 2008; Schauble et al., 2002), and these do not always align with those of museum professionals. For instance, only 13% of parents but 56% of staff believe that asking questions it is an effective strategy to support children's exhibit exploration (Schauble et al., 2002). In addition, a quarter of parents but no children's museum staff believe that a parents's role includes looking out for their children's safety, and the majority of children's

museum staff but a minority of parents believe that parents should encourage and facilitate their children's engagements and be involved as exhibit participants themselves (Knutson et al., 2011). As beliefs and expectations shape visitors' museum experiences, including their engagement behaviours, approaches to learning, and museum learning itself (see section 'Visitor Experiencescape: Visitor Portrait' above), such misalignment between what type(s) of interactions and roles an exhibit is designed for and how caregivers behave in it could lessen the potential outcomes of children's exhibit engagement.

Children are not just "citizens-in-waiting" (Lester et al., 2014) or "adults-in-formation" (Brighouse, 2009)—their interests and their relationship with the environment differ from adults' (Vygotsky, 1967/2004). Thus, they experience the museum differently (see section 'Roles' above). Efforts have been made to accommodate for this; for instance, child-focused text throughout an art museum differs from adult-focused text in both the complexity of its content and how it is displayed (Lipovsky, 2020). Nonetheless, evidence suggests that children innovate with exhibit materials (e.g., Dicks, 2013). Though children do not always engage with exhibits as intended, such that expected museum learning goals may not be attained, it does not mean they are not exploring and learning as "scientifically" or as much as "the planned possibilities" (Lucas et al., 1986). Illustrating the significance of alignment between visitor expectations and museum opportunities, evidence suggests that children benefit from pre-visit museum activities and orientations (Falk & Dierking, 2013; Lawson et al., 2018).

In addition to considerations of (mis)alignment between the museum and its visitors, differences between caregivers' and children's museum behaviours (see section 'Museum Behaviours' above) present a possibility of within-group (mis)alignment. For instance, evidence from museum makerspaces suggests that parents prefer following activity instructions, even if their children want to innovate with the materials (Jung et al., 2023). However, on school field trips, students are more dissatisfied with and less focused during museum visits when they do not share visit expectations and purposes with their teacher (Ingle, 1994). Additionally, findings have shown that "sustained shared thinking was most effectively established when *both* children and their parents were interested in, and curious about the exhibit content" (Degotardi et al., 2019, p. 186, emphasis in original). Therefore, when children's and caregivers' visit perceptions, expectations, and beliefs are more

aligned, children may enjoy their visit more, engage with exhibits more deeply and with increased focus, and, thus, experience greater museum learning.

Tension

A museum visit "requires no special training or skills" (Black, 2018, p. 307). Nonetheless, families personalise their exhibit experiences in ways that reflect "their family background, mode of interaction, or the adults' parenting and teaching styles" (Hein, 1998, p. 146). However, "museums themselves are created by people with cultural values and beliefs that shaped their decisions . . . The value and belief systems underlying the museum can be consistent with those of its visitors or not" (Falk & Dierking, 2013, p. 28). Moreover, despite that museums are meant to serve their communities, much of what we know about museum experiences and museum learning stems from research and evaluation "based on educated, middle-class, European-American families" (Ash & Lombana, 2013, p. 72). One consequence of this is that "museums tend to be bound by middle class values, which translate into certain behaviors and expectations of involvement" (Wood & Wolf, 2008, p. 128).

The beliefs, values, and assumptions that inform museum design and practice are embedded into the physical environment and the social situation (e.g., via facilitation practices), as modelled in the Visitor Experiencescape. While (mis)alignment considers the differences across the various museum visit stakeholders, broader societal tensions result in issues of (1) power between museums and their visitors and (2) equity amongst the diversity of potential visitors. Thus, those who share the dominant values and normative beliefs and behaviours for learning in museums may have disproportionately more positive and beneficial experiences. On the other hand, when there is too great of a mismatch between the visitor portrait and the museums' offered social situation and physical environment, it is unlikely that visitors will have the opportunity to interact and engage as productively. Without addressing these tensions and moving towards resolution, uncertainty and a lack of belonging could lead to negative emotional responses (e.g., frustration, confusion) and, as a result, visitors' potential museum learning could be stifled and/or visitors may disengage altogether (see Figure 3.3).

Power

Across the history of museums, "the production of 'truth' or 'knowledge' is a process that can be found to be operating at all times" (Hooper-Greenhill, 1992, p. 192). The elitist

history of museums has, therefore, led to a power imbalance in deciding what knowledge is worthy of production and distribution. Moreover, this imbalance is skewed away from the visitor and towards the museum professional who "makes decisions in relation to space, time, and visibility; in other words as to what may be viewed, how it should be seen, and when this is possible" (Hooper-Greenhill, 1992, p. 7). However, museums are experienced and, thus, do not act as a one-directional founts of knowledge. The assumptions made by museums of what is worthy of being learned and the ways through which it should be learned do not always acknowledge, respect, or match the perspectives of visitors.

In addition to the socially fabricated power imbalance of museums and stemming from the normative perspectives they have been built on, "the perception of a museum as an institution worthy of visiting represents a particular culturally developed vantage point" (Falk & Dierking, 2013, p. 32-33). Unsurprisingly, then, individuals from nondominant communities are less likely to have museum visits as part of their family practice (Moussouri, 2024). Yet museums are public institutions, which necessitates that they are designed to reach, serve, and resonate with a broad and diverse audience, even though attendance is not mandatory (Hooper-Greenhill, 1994; Falk et al., 1986). Mismatch arising from individuals' notions about how museums are situated in society, as a specific type of place for a certain type of person to learn from by engaging in a particular way, can both prevent potential visitors from becoming visitors and hinder the productive engagement of those who do visit.

Children's museum materials are brought to life and given meaning by their visitors, and exhibit themes often incorporate the local community (e.g., the Children's Discovery Center in Honolulu, Hawaii is home to a pretend play pineapple field exhibit) (see section 'Where?' in Chapter Two). As such, children's museums appear less susceptible to museum-visitor mismatch stemming from elitist and dominant perspectives of what is worthy of knowing. Under the surface, however, museums' perspectives about *how* children learn and what supports their engagement and learning, which underpin museum design and practice, may not be consistent with diverse caregivers' beliefs and behaviours.

Equity

Design is "scratched and scored by the remnants of their creators' thought processes and assumptions" (Holmes, 2018, p. 89), such that museum professionals embed their own theories of how children learn into exhibits (Allen & Gutwill, 2016). However, "the goals,

strategies, and expectations for family learning through specific parent-child interaction and engagement—no matter how desirable on the part of the museum—might conflict with culturally and situationally responsive parenting and family interactions" (Wood & Wolf, 2010, p. 37). Therefore, whether museums facilitate or inhibit family learning could be the result of (mis)match between institutional and family agendas, resources, capital, and practices (Archer et al., 2016; Ellenbogen et al., 2004; Moussouri, 2024).

Caregivers' views of how children learn differ from one another, and their views influence how they interact with their children in children's museums (e.g., Luke & Windleharth, 2013). While some museum approaches are culturally sustaining across socio-cultural backgrounds (e.g., hands-on, interactive, learner-centred and collaborative) (Briseño-Garzón & Anderson, 2012; Weiland, 2015), evidence suggests that caregivers from different socio-cultural backgrounds also hold different views on museum engagement, including the benefits of play; the purpose and expectations of visits; museum interactions and behaviours, including whether and how adults participate in play; and whether and how children's learning occurs during visits (Bayındır & Cengiz, 2022; Fasoli, 2014; Gaskins, 2008; Wang et al., 2019). For example, while who a visitor interacts with during their museum visit shapes their experience (see section 'Visitor Experiencescape: Social Situation' above), and evidence suggests that children's learning is greater with caregiver involvement (e.g., Crowley & Callanan, 1998; Gaskins, 2008; Puchner et al., 2001), Latino parents separate from their children during museum visits significantly more than Euro-American parents (Fasoli, 2014). In addition, evidence suggests that parents' education level impacts their museum interactions with their children (e.g., length and scaffolding of exhibit exploration; interaction style; conversational strategies employed) (Siegel et al., 2007; Szechter & Carey, 2009; Tenenbaum & Callanan, 2008). Moreover, even when caregivers, including those from nondominant communities, *want* to engage with museum exhibits and their children in ways that *are* supported and even expected by museum practice, they are not always able to do so as a result of sociodemographic expectations. For instance, parents are limited by signage both when they do not have specialist knowledge for terminology used *and* when they are non-native speakers, but signage is only provided in one language (Archer et al., 2016; Weiland, 2015).

In addition to equity-related mismatch arising from the general design and practices embedded throughout a museum experience, discrete episodes of mismatch can have

extensive consequences. For example, a lack of signage and/or staff to facilitate in visitors' native language creates a feeling of discomfort, resulting in an environment that is not only culturally inaccessible, but also emotionally unwelcoming (Weiland, 2015). It is important to acknowledge that, while this mismatch might be most noticeable in the museum itself, it does not only arise during the participation phase of the microexperience of museum engagement. For instance, in anticipation of discomfort in the museum environment, a research participant from a nondominant community chose to pack their own lunch rather than navigate the museum's café during their visit (Moussouri, 2024).

Tensions of power- and equity-related mismatch may dampen a visitor's sense of competence and hamper their sense of belonging, or relatedness, which could, in turn, reduce their motivation to engage (Ryan & Deci, 2020), likely hindering their museum learning *and* diminishing the likelihood that they return to a museum (e.g., Black, 2018; Falk, 2021).

(Mis)match Changing with Museum Visiting Experience and Habits

Museum experiences depend on visitors' museum literacy, museum visitation habits, and site familiarity developed from prior visits (see section 'Visitor Experiencescape: Visitor Portrait' above; see section 'Macroexperience' above). As a result, first-time museum visitors report both uncertainties about and a desire for help with navigating their visit (Weiland, 2015). Disorientation can be heightened "in the case of socially disadvantaged families due to the greater mismatch between family/personal and institutional habitus" (Archer et al., 2016, p. 935). Illustrating the promising potential of resolving mismatch, while families from nondominant communities are less likely to visit museums, when museum visiting becomes part of their family practice, such that they visit frequently and gain familiarity in engaging with(in) museums, both caregivers and children from nondominant communities are more comfortable navigating museums and are able to reap the benefits of engaging with museum opportunities (Moussouri, 2024).

It should not be the sole responsibility of visitors to accommodate and match with museum expectations and practices. Bronfenbrenner (1979) hypothesised that "development is enhanced to the extent that, prior to each entry into a new setting . . . the person and members of *both settings* involved are provided with information, advice, and experience relevant to the impending transition" (p. 217, emphasis added). As such, museums also "need to recognize and accommodate the resources families bring to the

museum in order to create a successful family learning context" (Ellenbogen et al., 2004, p. S53). In fact, evidence shows that greater match between museum exhibits and visitors' own lives and backgrounds results in more meaningful and impactful experiences, including for child visitors and visitors from nondominant communities (Anderson et al., 2002; Moussouri, 2024). Museums must make an effort to close gaps of mismatch by offering ways to engage that are responsive to and consistent with family resources, capital, and practices of all backgrounds.

Progressing Towards Resolution

Assumptions about what is worth learning and how it should be learned are embedded in museum practices: design *and* facilitation, physical *and* social. Effective museum spaces acknowledge that each visitor will bring with them their own lens through which they see the world, learn about it, and incorporate new knowledge (O'Neill, 2006). Without supporting engagement and interaction in ways that offer to close mismatch arising from misalignment and tension, museums might be unknowingly perpetuating or, worse, reinforcing problematic trends. Just as educational research can support educational practice by providing both what contributes to achieving a particular goal (i.e., a technical role) and new perspectives from which to view learning (i.e., a cultural role) (Biesta, 2007), efforts to establish a shared understanding could help match the perspectives and expectations of different visit stakeholders, while also providing a range of opportunities to meet a diversity of museum visitor needs and engagement styles.

Whereas "in the past, the knowledge of the object was the most important knowledge required to make an exhibition; now, knowledge about the audience is equally important" (Hooper-Greenhill, 1992, p. 208-210). As a result, museum exhibits "are now sometimes the product of joint efforts between audience and museum worker" (Hooper-Greenhill, 1992, p. 200). For instance, there has been a shift in the field from research *on* visitors to now prioritising research *with* visitors, including children (e.g., Carter, 2017; Dockett et al., 2011). This work acknowledges visitors' active role in the museum experience, rather than museums as knowledge keepers. Fortunately, the voices being gathered and incorporated are also becoming more diverse. Although these efforts have begun to decentre, to some extent, the museum voice as "authority", much work remains. It is necessary that future research carried out and practices implemented across the field explicitly acknowledge and address these issues. Finally, museum visits are voluntary—as a

result of being self-selected, visitors differ from nonvisitors (see section 'Who?' in Chapter Two), and it is essential that future research strives to capture the voices of nonvisitors.

Theoretical Underpinnings of Museum Learning

Shortcomings of Sociocultural Perspectives

On the surface, the hands-on, play-based approach that is core to children's museums (see section 'The Children's Museum' in Chapter One; see section 'Where?' in Chapter Two) might appear constructivist. In fact, early museum research, design, and practice, particularly in children's museums, were strongly rooted in a constructivist perspective (Hein, 1998; Lewin, 1989). However, it has been increasingly recognised that "learning in museums is highly social in nature, and museum researchers are beginning to embrace sociocultural perspectives to describe learning" (Allen, 2002, p. 262). As "visitors actively create and make meaning of their own experience" (Falk & Dierking, 2013, p. 105), the recent work in the field "views museums as primarily *institutions of mediation*" (Noy, 2021, p. 39, emphasis in original). Findings that story, play, and familiar items mediate children's museum experiences have led researchers to suggest that museums implement "child-based, socio-cultural strategies" (Anderson et al., 2002), and research on children's learning in museums has largely shifted from child- to family-centred, with the majority framed by sociocultural theory (Andre et al., 2017).

According to sociocultural perspectives, children play an active role in their own development, yet their growth also depends on social interaction and mediation, particularly that of language (e.g., Daniels, 2010). Within sociocultural theory, Vygotsky's (1978) mediational model of development suggests that "every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, *between* people (*interpsychological*), and then *inside* the child (*intrapsychological*)" (p. 57, emphasis in original). From this perspective, then, learning and development are not only supported by social interaction, but rather they necessitate it.

Moreover, what can be done by an individual alone is completed, retrospective mental development, whereas what can be achieved *with support* (i.e., scaffolding) is in process and, thus, prospective development (Vygotsky, 1978). Highlighting this difference, Vygotsky (1978) defined the zone of proximal development (ZPD) as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or

in collaboration with more capable peers" (p. 86). While this further emphasises a reliance on others, it also suggests that, to most benefit, development may depend on mediation from someone familiar with the learner's current developmental level and learning strategies, such that they can support the learner in bridging the ZPD's difference most effectively. One "major source of development" (Vygotsky, 1978, p. 102), play creates a ZPD that allows children to think and act above their capabilities.

Importantly, development does not emerge from a single factor. Instead, as Rowe and Wertsch write, "the key to development is neither in the child alone, nor in the tools made available to the child as part of particular cultural practices, but in the interaction between child and tools in activity" (p. 544). In fact, sociocultural perspectives, at times, view these interactions and relationships as inseparable across the individual, social, and contextual levels, instead of reducible and simultaneously examined at the individual level (Daniels, 2008).

From a sociocultural perspective, then, the best learning experiences are socially interactive and co-constructed, resulting when the learner and a more knowledgeable partner participate together (e.g., intersubjectivity, joint talk) (Rowe & Wertsch, 2002). In particular, speech and conversation serve as the primary mediators and catalysts for development (Vygotsky, 1978). As a result, visitor studies and museum learning work framed by sociocultural perspectives have drawn heavily on conversations, especially those between visitors within the same visiting group.

Describing their model of museum learning, Leinhardt and Knutson (2004) write the following:

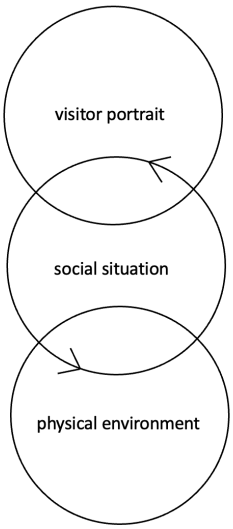
> The model considers learning to be a form of conversational elaboration among participants. Learning is influenced by three clusters of factors: the cumulative personal historical identities of the visiting group; the designed features of the environment with which the group interacts; and the explanatory engagement of the group with objects, ideas, and concepts in an exhibition. (p. xiii)

In this model, the three factors are connected by unidirectional arrows, representing linear causal influences, in which visitor identity and the learning environment each independently influence explanatory engagement *and* learning; explanatory engagement, in turn, also influences learning.

As shown in Figure 3.4, this sociocultural-informed and conversation-based perspective for museum engagement and learning can be alternatively modelled in a way that retains the factors of the Visitor Experiencescape; however, in doing so, the form and function must be altered. Resulting in not only different but also incomplete relationships between the Visitor Experiencescape factors, it becomes evident, for reasons discussed next, that sociocultural theory *cannot* fully capture a visitor's museum experience.

Figure 3.4

Visitor Experiencescape Variables Modelled Through a Sociocultural Perspective



Firstly, a sociocultural perspective rooted in conversation assumes that museum learning is a group experience. Though museum exhibit materials can prompt visitors to share their own life experiences in ways that support the group experience and extend learning (Briseño-Garzón & Anderson, 2012; Hein, 1998; Leinhardt & Knutson, 2004; Moussouri, 2024), and evidence suggests that family museum conversations can increase children's learning (see section 'Family Resources' above), examining conversation as meaning-making limits museum learning to the group level. This overlooks that adults sometimes visit independently (e.g., Packer & Ballantyne, 2002), dyads sometimes split up to explore individual interests before continuing together (e.g., Allen, 2002), and children spend time engaging independently during museum visits (e.g., Fasoli, 2014). Moreover, learning emerges from and during these solitary experiences. Not only do visitors still learn,

but evidence suggests that, at times, *more* learning might occur during independent exhibit engagement than with others (e.g., Falk et al., 1998). In addition, merging the visiting group into a cumulative group identity fails to account for the roles, worldviews, and interplay *between* individual visitors, which can lead to different behaviours and museum learning (see section 'Visitor Experiencescape: Visitor Portrait' above; see section 'Roles' above).

Secondly, the unidirectional influence of the factors treats museum engagement as a linear sequence rather than an interdependent process. As a result, the visitor portrait and physical environment, which serve as initial informants, are regarded as relatively static across the period of engagement, particularly compared to the social situation's dynamic mediation between them. Thus, although a linear loop illustrates continuous exchange and acknowledges the ability of the environment to serve as a "conversational springboard" (Leinhardt & Knutson, 2004), its function is one of sequential mediation rather than simultaneous contribution and continuous interaction. This fails to accurately model how visitors learn, as a museum experience depends on all three factors *and* their interdependency, including the personal moment-to-moment, mutually dynamic (re)definition of the individual and their environment (see section 'Experience' above; see section 'Triadic Intersection' above; see section 'Microexperience' above).

Thirdly, and as a particularly important consequence of the shortcomings of unidirectional influence just discussed, while this perspective acknowledges that conversations remain personal and the explanatory engagement that leads to learning *depends on* visiting group identity *and* the museum environment, it omits a direct link between the visitor portrait and the physical environment. Instead, these are regarded only as triggers for and shapers of the social situation, which becomes the true mediator. However, adult recollections suggest that school-aged museum experiences are more memorable and enjoyable when they include *hands-on* elements (Pace & Tesi, 2004). In fact, visitors engage more with *hands-on* than artefact-based exhibits, and even less with readable ones (Allen, 2002). Highlighting the importance of both their social *and physical* interactions in museum learning, children on field trips at science centres remember content knowledge taught by museum facilitators, but their exhibit exploration and later recall tends to be overshadowed by their understanding of how to physically use materials and operate exhibits, their sensory engagements, their emotional reactions (e.g., had fun, something was boring), and their peer interactions (Dicks, 2013; Shaby et al., 2017).

Additionally, evidence suggests that visitors, both adults and children, learn a variety of things through observation during their visits (e.g., self-efficacy: Gutwill, 2018; about others in their visiting groups: Luke et al., 2019; how to use exhibit materials: Wöhrer & Harrasser, 2011).

When conversation is regarded as *the* mediator for museum learning, the influence of other types of interactions between social partners is discounted, further necessitating an approach that incorporates spatial considerations of visitors directly within their environment. For example, evidence suggests that physical movement through the museum space is a unique choreography and "dance of agency" between visitors within the same visiting group, such that visitors also "mutually create for each other a "design for learning", a frame within which the museum experience operates" (Diamantopoulou & Christidou, 2016, p. 11). Research with family visiting groups has begun to analyse their bodily modes of interaction alongside their verbal communication, and findings suggest that this is a significant dimension for building more complete understandings of museum experiences. For instance, this work has identified the ways in which parents use words *and* behaviours to focus their children's attention and provide activity guidance (Jung et al., 2023; Price et al., 2022). As a result, a sociocultural perspective, especially one that relies on conversation as meaning-making, overlooks the full scope of possible visitor behaviours, interactions, and engagement types, as well as the variety of museum learning that can unfold during a visitor's direct engagement with their environment, both physical and social (see section 'Museum Learning' in Chapter Two; see section 'Experience' above; see section 'Microexperience' above).

The shift towards sociocultural perspectives might have emerged as a result of conversations being data to collect and examine. It is not that learning in museums does not occur through conversation, but rather that, as just discussed, visitor engagement and museum learning as conversation is incomplete. Consistent with the understanding that "a museum visit can be very complex, involving different dimensions of a visitor's life, including the physical, the intellectual, the social, and the emotional" (Pekarik et al., 1999, p. 153), review findings suggest that hands-on exploration, scaffolding interactions, and evoking situational emotion (e.g., excitement, curiosity) can support children's learning across museum types (Andre et al., 2017). Moreover, evidence suggests that not only does no one measure alone (i.e., conversations, time spent, or engagement level) adequately capture

family museum experiences, but, also, that family conversation is *not* necessary for families to have engaged and rich learning experiences in children's museum exhibits (Sanford, 2010). Therefore, while museum professionals and researchers must remain mindful of group dynamics and social interactions, they must do so in a balanced way.

It is clear that, whereas constructivist approaches to museum learning did not adequately represent the social situation of the museum, sociocultural perspectives have adversely decentred the physical environment and its (inter)active role. As a result, although widely used, sociocultural approaches are inadequate and insufficient for modelling museum experiences and informing museum design and practice, including, and particularly, in relation to family visits to children's museums.

Insufficiencies Pronounced in the Children's Museum

That children's museum professionals believe children's museums differ from other types of museum institutions in *how* visitors learn (e.g., more interactive and hands-on, through play) (Luke & Windleharth, 2013) suggests that visits to children's museums involve a greater extent of physical engagement than those to other types of museum institutions. Echoing the shift from objects and artefacts to *materials* made meaningful through interaction, in which children enter into and become part of museum exhibits for the length of their play (see section 'Where?' in Chapter Two), unlike traditional museums, which are more likely to be designed around the interpretation and preservation of artefacts, children's museum exhibits are designed around the ways children learn *and behave* (Lewin, 1989). In fact, evidence suggests that children interact more with children's museum exhibit materials than they do with others, both adults and other children (Braswell, 2012). Not only do children physically interact with museum materials during exhibit engagement, but, during post-interaction interviews, they also communicate their experiences through their body, such as by using gestures (Nygren et al., 2024). The necessity of an approach that considers children's interactions with the physical environment is further exemplified through each experiential span of time (see section 'Spans of Time' above). Across the microexperience of engagement with(in) a children's museum exhibit, evidence suggests that, for older children, social interactions decrease but children's material interactions increase (Braswell, 2012). At the macroexperience level, as families make repeat visits to an exhibit, there tends to be a decrease in interpersonal interaction but an increase in interaction with hands-on materials (Wood & Wolf, 2010). Thus, a sociocultural perspective

overlooks some of the richly dynamic engagement patterns that could inform children's museum design, practices, and visitor support.

Though child visitors are inherently part of a group (see section 'Who?' in Chapter Two), and evidence substantiates the importance of caregiver-child joint engagement and joint talk for museum learning (e.g., Crowley & Callanan, 1998; Crowley et al., 2001), social interactions are neither the only nor the most important way in which children learn from children's museums. In addition to insufficiently recognising the range of children's museum behaviours and engagement types, sociocultural approaches fail to capture the full scope of museum learning. Children learn through social *and* physical environmental interactions, such that optimal learning is a dynamic process that engages the whole child (e.g., Csikszentmihalyi & Hemanson, 1995; Hirsh-Pasek et al., 2009). In fact, parents reflecting after children's museum visits report both playing and multi-sensory exploration *and* socialising as benefits for their children (McInnes & Elpidoforou, 2018). Furthermore, evidence suggests that didactic exhibits in a natural history museum better support caregiver-child interactions and children's *content* knowledge learning than interactive exhibits (Weisberg et al., 2023). However, as museum learning goals expand from content knowledge, particularly in children's museums (see section 'Why?' in Chapter Two), interactive exhibits' potential for non-content knowledge museum learning, such as Lifelong Competencies, could be overlooked by current approaches and understandings. The strong and direct link between how visitors engage with museums' physical environments and their museum learning heightens the necessity to adopt a more comprehensive theoretical approach to visitor experiences, especially during family visits to children's museums. Such an approach would not only support more accurate understandings, but it could also inform museum design and practices that maximise visitor growth.

While recent arguments have suggested that approaches taken to understand children's learning in museums should be framed by entanglement, sociomateriality, place-making, embodiment, and spatiality (Hackett et al., 2018; Kervin et al., 2024; Nygren et al., 2024), these perspectives may lean too heavily back on the physical environment and view the learning process as distributed rather than (re)defining. A more appropriate approach to understanding museum learning would be inspired by Bandura's (1978a, 1978b) Social Learning Theory, particularly the concepts of reciprocal determinism, observation, and efficacy.

Fit of Applying Social Learning Theory

Reciprocal Determinism

Reciprocal determinism, a process in which influencing factors "all operate as interlocking determinants of each other" (Bandura, 1978b, p. 344), is proposed as an essential extension for understanding museum engagement and, ultimately, museum learning. As "the process involves a triadic reciprocal interaction rather than a dyadic conjoint or a dyadic bidirectional one" (Bandura, 1978b, p. 344), it accurately reflects the reciprocity of engagement that defines an experience (see section 'Engagement' above) *and* the triadic intersection of the three contributing factors to a museum experience, including the dynamic nature in which they interdependently (re)define each other across a visit (see section 'Triadic Intersection' above; see section 'Microexperience' above). Furthermore, through this reciprocity, "personal and environmental factors do not function as independent determinants; rather, they determine each other" (Bandura, 1978b, p. 345). As a result, reciprocal determinism satisfies the need for a direct link between the environment and the individual that is overlooked by the application of sociocultural approaches to museum contexts (see section 'Shortcomings of Sociocultural Perspectives' above) and that is particularly significant in understanding children's museum experiences (see section 'Insufficiencies Pronounced in the Children's Museum' above).

Through reciprocal determinism, personal "determinants are treated as integral, dynamic factors in causal processes rather than as static trait dimensions" (Bandura, 1978b, p. 348). Consequently, this approach encompasses and remains sensitive to situational variables of the visitor portrait that can change during the period of museum engagement (see section 'Visitor Experiencescape: Visitor Portrait' above; see section 'Microexperience' above). Thus, reciprocal determinism fills a gap of sociocultural perspectives, which tend to account for the visitor portrait linearly and, therefore, visitor characteristics as pre-defined and static (see section 'Shortcomings of Sociocultural Perspectives' above). Not only are personal determinants better represented, but Social Learning Theory also acknowledges independent learning from "personal accomplishment" (Bandura, 1978a), opening the scope of possibilities for considering museum learning that would go unaccounted for in sociocultural perspectives, where museum learning is co-constructed through conversation (e.g., Leinhardt & Knutson, 2004).

While Bandura typically examined and modelled the *individual* in his work, reciprocal determinism does not necessitate that the individual refers to a single person, and, as a result, it could be used to model and understand *both* the level of the individual visitor and/or the visiting group as a cohesive unit (see section 'Visitor Experiencescape: Visitor Portrait' above). In this way, reciprocal determinism fills another gap left by museum models underpinned by sociocultural theory and *group* conversation (see section 'Shortcomings of Sociocultural Perspectives' above). Moreover, in place of a cumulative group visitor identity that influences group conversations, reciprocal determinism accounts for intra-group variability, with the appreciation that "people reciprocally determine each others' actions" (Bandura, 1978b, p. 356). This more accurately describes and explains the mediating role of caregivers and the distinct patterns that are reflected across individuals within the same visiting family group (i.e., caregiver versus child) (see section 'Roles' above).

The third key factor of reciprocal determinism in Social Learning Theory, alongside personal and environmental factors, is behaviour (Bandura, 1978b). The variety and type(s) of engagement between an individual and their environment influence the change that results from an experience (see section 'Generativity' above). One way in which children's museums are different from other museum types is their emphasis on play and hands-on engagement; as a result, children's museums are uniquely designed for how children behave (see section 'Insufficiencies Pronounced in the Children's Museum' above). Thus, the explicit consideration given to behaviour is an important improvement for making sense of and supporting children's learning in children's museums.

Observation

Another notable gap in applying sociocultural approaches to museum experiences has been identified as an overfocus on conversation as *the* mediator for museum learning. However, facilitators and other visitors, both within and outside of an individual's visiting group, can significantly impact a visitor's museum experience in ways other than conversation, including through observational learning and physical behavioural actions (e.g., gestures, gaze) (see section 'Roles' above; see section 'Shortcomings of Sociocultural Perspectives' above). In fact, during their visits, children shift in their spectator-performer relationships relative to others (Dicks, 2013), are curious about what others do (Henderson & Atencio, 2007), and learn by observing others (Anderson et al., 2002; Wöhrer & Harrasser, 2011). Through the concept of vicarious experiences, or the observation of others and the

effects of *their* behaviours (Bandura, 1978a, 1978b), Social Learning Theory could expand the ability for work across the museum field to capture these significant avenues for learning. Thus, while not discounting that conversation can be rich and meaningful in museums, Social Learning Theory is a promising way to build a more complete view of the dynamic ways through which museum learning unfolds.

Efficacy

Museums are free-choice settings in which visitor-environment (mis)match influences visitors' museum experiences in a plethora of ways, including their visitation habits, expectations, engagement, interaction, and learning (see section '(Mis)match' above). In addition to filling gaps left by framing museum experiences with other theoretical approaches, Social Learning Theory specifically addresses this (mis)match through the concept of efficacy, thereby deepening the understanding of visitors. According to Bandura (1978a), "efficacy expectations are a major determinant of people's choice of activities, how much effort they will expend, and of how long they will sustain effort in dealing with stressful situations" (p. 142). This engagement perspective can enhance understanding of museum visitors' behaviours. For example, evidence suggests that children's engagement is highest with partially completed, as opposed to uncompleted or fully completed, hands-on, goal-driven science museum exhibits; this has been attributed to the way that partially completed exhibits may provide an optimal level of challenge for visitors, as well as clues that reduce uncertainty of what is expected (Henderlong & Paris, 1996). Efficacy can also be applied with a learning orientation. For instance, science museum visits can increase adults' science self-efficacy through their own exhibit engagement, watching others, and having a positive emotional experience (Gutwill, 2018).

Most importantly, according to Bandura (2012), "the environment is not confined to physically proximate influences" (p. 12), and sociostructural factors can mediate the effects of self-efficacy on behaviours. Thus, by thoughtfully applying the concept of efficacy expectations, Social Learning Theory is able to address stakeholder (mis)alignments and power and equity tensions (see section '(Mis)match'). While these have been acknowledged across the field as important and urgent issues, they have, to date, not received the attention necessary to answer calls for action, perhaps as a result of approaches that do not explicitly or effectively incorporate them. For instance, socio*cultural* perspectives take into consideration an individual's culture, beliefs, and values and, as such, can *identify* mismatch

and tension. However, the conceptualisation of efficacy from Social Learning Theory goes further in that it also helps explore how mismatch and tension might be *reduced* from both the visitor and the museum perspectives. For example, recurring museum visits build *visitors'* understandings of how to engage, as well as their confidence to do so, even among nondominant community visitors (Moussouri, 2024). Additionally, after partnering with community members and organisations to support their understandings of and abilities to design and facilitate for children with disabilities, *museum professionals* feel more capable interacting with diverse visitors (Golden & Walsh, 2013).

Finally, according to Bandura (1978b), "the experiences generated by behavior also partly determine what individuals think, expect, and can do, which in turn, affect their subsequent behavior" (p. 345), and positive museum experiences increase the likelihood of future museum visits (Falk, 2021; Piscitelli & Anderson, 2001). Thus, efficacy is also helpful in understanding visitors' choices to visit museums in the first place and in exploring the role that museums play in society, including both visitors' and nonvisitors' lives. It is evident that a theoretical approach that centrally considers efficacy, such as Social Learning Theory, offers to contribute an invaluable perspective to the field.

Applying the concepts of reciprocal determinism, observation, and efficacy from Bandura's Social Learning Theory to museum engagement and museum learning would strengthen the field in building better and more comprehensive understandings of visitors' experiences, supporting both research and practice. As highlighted, this approach and these considerations become even more crucial when examining family visits to children's museums.

(Inter)action With(in)

Reciprocal determinism acknowledges and emphasises that museum learning is not itself embedded in exhibits that transmit knowledge, but rather that learning emerges as exhibits are engaged with and changed by visitors. This builds on Chapter Two's (see section 'Where?') discussion of exhibits, particularly that while a museum exhibit can offer experiential opportunities, it is by engaging *with* children's museum exhibit materials that value is created, personal meaning made, and museum learning generated. Further, reciprocal determinism captures the various interactions that occur between visitors, their fluctuating social situations, and the physical museum environment.

Simply put, museums are interactive: socially *and* physically. As a result, to capture the types of engagement that occur during and influence visitors' museum experiences, the museum visit can be discussed as an individual visitor or visiting group's *(inter)action with(in)* the museum environment. The term "(inter)action with(in)" captures four distinct elements of the museum experience. When visitors *interact within* the museum, they are engaging socially with others (e.g., conversation, gestures, observation); while this is typically related to exhibit content, it is not always. When visitors *interact with* the museum, they are physically or cognitively engaging with museum materials, whether the materials are being used as intended or not (e.g., hands-on exhibits, reading signage). To *act with* a museum involves navigating its cultural milieu (e.g., museum social scripts, visit norms, rules, institutional expectations); this is where most issues of mismatch and tension might arise, as well as considerations of efficacy. To *act within* a museum captures the ways visitors move through the space, as well as a museum's spaces-in-between (e.g., wayfinding, orientation). Finally, conscious disengagement from (inter)action becomes a visitor choice, one which is set within the museum that itself is filled with opportunities to (inter)act with(in).

Museum experiences are a constant (re)negotiation of space and engagement, and their full potential is unlocked with, and understood through, the range of dynamic visitor (inter)actions with(in) the museum. As such, visitors are active agents who have a full mind and body experience. Nonetheless, the opportunities that museums offer are designed, and these design decisions influence how visitors choose to (inter)act with(in) them.

Experience Design

Marked by engagement between an individual and their environment, neither do an experience and the development it generates occur in a vacuum (Bandura, 1978b; Dewey, 1938/1997), nor does the environment dictate the engaged individual's behaviour (Bandura, 1978b). Nevertheless, "environmental influences partly determine what people attend to, perceive, and think" (Bandura, 1978b, p. 345), such that, according to Dewey (1938/1997):

> The immediate and direct concern of an educator is then with the situations in which interaction takes place. The individual, who enters as a factor into it, is what he is at a given time. It is the other factor, that of objective conditions, which lies to some extent within the possibility of regulation by the educator. (p. 45)

A museum exhibit must be appealing enough to first attract visitors (i.e., by gaining their interest) *and* hold their attention (i.e., via intrinsic motivation) *before* achieving its goals, cognitive or affective (Csikszentmihalyi & Hemanson, 1995; Shaby et al., 2016; Shettel & Reilly, 1966). In order "to create experiences that truly stand out and produce intended results, someone must intervene in a purposeful way" (Rossman & Duerden, 2019, p. 14). This purposeful intervention is the work of experience design, defined by Rossman and Duerden (2019) as "the process of intentionally orchestrating experience elements to provide opportunities for participants to co-create and sustain interactions that lead to results desired by the participant and the designer" (p. 14). The museum experience elements that can be intentionally orchestrated include the design of physical environments and the support and training of museum professionals to facilitate the social situations within them. Less often acknowledged, experience design must also consider the museum rules that contribute to the social situation (see section 'Visitor Experiencescape: Social Situation' above). As experience design is focused on museum environments and the situations and activities within them, it centres on the participation phase, or the microexperience; however, for optimal design, decisions must be informed by an appreciation and understanding of the macroexperience, including the anticipation and reflection phases (see section 'Visitor Experiencescape: Time' above). For instance, "designing for emotions requires thinking about how users will anticipate an experience and how they will remember it later" (Lupton, 2017, p. 59).

(Un)predictability

As evident from the visitor portrait as a defining factor of the Visitor Experiencescape, museum "design is dramatically affected by the perceptions of the visitor. No matter how clever the designer is and no matter how adroit the manipulation of learning factors, the patron's worldview will color every perception" (Dean, 1994, p. 27). Some visitors' individual differences represent patterns that *are* predictable and can be pre-planned for by offering a variety of ways to interact and engage. For instance, evidence suggests that a child's gender impacts their exhibit material engagements and parent-child museum interactions (Franse et al., 2020; Crowley et al., 2001; Wöhrer & Harrasser, 2011), which could inform the implementation of a range of design elements and facilitation techniques. Additionally, some museum exhibits are intentionally designed for more visitor self-direction than others (e.g., exhibits designed for children's free play versus guided play

versus directed play: Caporaso et al., 2022), and thus offer opportunities to accommodate anticipated visitor differences through intentional unpredictability, which influences visitor engagement, interactions, and museum learning.

As social and interactive spaces, there are also museum visit elements that are inherently less able to be designed. These introduce unpredictable variability between museum experiences, such as the level of crowdedness during a given visit (Briseño-Garzón et al., 2007b; Leinhardt & Knutson, 2004); however, design elements (e.g., walls, ropes) can be implemented to help alleviate potential negative impacts on visitors' experiences. Additionally, the presentation of exhibit materials influences a visitor's experience (see section 'Visitor Experiencescape: Physical Environment' above). As interactive spaces, the materials within exhibits can have a high level of variability, such that their presentation is unpredictably determined by and across visitors rather than intentionally chosen by exhibit designers and educators. For instance, the state that previous visitors leave goal-directed children's museum exhibits in (e.g., fully completed, partially completed, uncompleted) influences children's engagement and motivation (Henderlong & Paris, 1996). While the physical environment of collections-based museum exhibits is unlikely to change in layout across the span of a day or a visit (e.g., object-based art museums, artifact-based natural history museums), the hands-on exhibits with loose materials that characterise children's museums lead to a fluctuating physical environment, introducing a higher degree of unpredictability. This inability to ensure that conditions are consistently offered to all visitors further supports the value of reciprocal determinism not only for understanding a single visitor or visiting group's experience, but also as an important lens for museum design decisions, particularly for children's museums.

Variety

An "experience derives from the interaction between the staged event and the individual's prior state of mind and being" (Pine & Gilmore, 2020, p. 16), and museum visitors come with a range of backgrounds (see section 'Visitor Experiencescape: Visitor Portrait' above). As a result, a "[participant's] role needs to be anticipated and accommodated in the experience design" (Rossman & Duerden, 2019, p. 29). Holmes (2018) writes that "[Susan Goltsman's] definition of inclusive design will always be my favorite: Inclusive design doesn't mean you're designing one thing for all people. You're designing a diversity of ways to participate so that everyone has a sense of belonging" (p. 53). Thus,

although visitors might experience the museum in unpredictable ways, some aspects of the museum can be universally designed for visitor engagement (e.g., physical environment: interactive exhibit features), while others must be pre-planned to accommodate a variety (e.g., visitor portrait: interests).

Unique from other settings, including traditional museums, children's museums are a way to compensate for the differences in how adults and children learn. However, everyone learns in their own way (e.g., Diamond et al., 2016). Moreover, museums are free-choice institutions where visitors follow their own interests (see 'What?' in Chapter Two). For example, while unfamiliarity can generate situational museum interest that elicits exploration (Csikszentmihalyi & Hemanson, 1995), pre-existing interest is a driver for deeper and more enjoyable engagement (Henderson & Atencio, 2007), and visitors engage longer with exhibits they find personally interesting (Diamond, 1986; Heuken et al., 2021). In addition, during family visits, caregiver engagement varies with their expertise, familiarity, interest, and enjoyment of exhibit content (Dockett et al., 2011; Haas, 1996; Price et al., 2022). It is important that the opportunities afforded by children's museum experience design have enough variety to meet the needs and satisfy the interests of diverse visitors (e.g., a range of ages: McInnes & Elpidoforou, 2018 and backgrounds: Mayfield, 2005; various levels of difficulty, various social groupings, and various adult roles: Gaskins, 2008; a variety of learning styles between children: Lewin, 1989).

Experience design must not only account for a variety of stable visitor characteristics, but also a variety of situational variables. For instance, as a result of the different ways that children engage with and respond to diverse exhibit elements, offering a variety of opportunities within a visit supports a wide range of museum learning outcomes (Anderson et al., 2002). Further, it is the uniqueness, quantity, and *variety* of materials and activities that support caregivers in learning about their children during children's museum visits (Luke et al., 2019). Thus, in addition to offering a variety of opportunities to fulfil different interests and needs *between* visitors, museum experiences also benefit from a variety of ways to engage across a single museum visit "in the same way a composer uses various tempos, tones, and instruments to create a symphony" (Rossman & Duerden, 2019, p. 48). However, having too many opportunities can "discourage visitors from spending substantial time and concentration on any one activity" (Schauble et al., 2002), such that it is imperative to implement variety thoughtfully.

Balance

In addition to offering enough opportunities across a museum to support diverse visitors and various learning outcomes but not too many that visitors have difficulty sustaining their engagement, individual exhibit engagements must also be balanced. According to Dewey (1938/1997), when designing experiences, it is essential that "planning must be flexible enough to permit free play for individuality of experience and yet firm enough to give direction towards continuous development of power" (p. 58). This is echoed in the museum literature with calls that the museum environment needs to be open-ended enough for visitors to have a sense of freedom but also controlled enough to guide them (e.g., Hein, 1998). Without striking balance in exhibit design, museum visitors can respond negatively. For instance, evidence suggests that while including steps into an exhibit activity encourages visitors to stay longer at an exhibit (Loomis, 1987), having too many steps in an activity results in frustration (Borun et al., 1997). Moreover, while it is important to attract and hold visitors' attention, overstimulation during any experience can lead individuals to "become overwhelmed, anxious, or confused" (Rossman & Duerden, 2019, p. 19). Such negative reactions during museum visits may result in disengagement, a loss of learning potential, and even serve to impede future visits. Design decisions can support balanced experiences; for example, adding benches or providing wayfinding and conceptual orientation can reduce museum fatigue arising from mental overstimulation, exhibit task demands, and physical overexertion (Dean, 1994; Hein, 1998; Loomis, 1987).

Personalisation and Participation

When setting the stage for engagement, museums must be mindful of how individual differences can result in personalised needs. According to Holmes (2018), "participation doesn't require a particular design. But a particular design can prohibit participation" (p. 54). Evidence suggests that this is true in the museum environment. For example, "architectural and design features can make it easier or harder for individuals with disabilities to utilize the museum" (Falk & Dierking, 2013, p. 28). It is promising that many museums have begun creating and adopting audience diversity, equity, accessibility, and inclusion (DEIA) documents and, further, that the principles and strategies they set forth are used in practice. For example, art museums have begun lending colour correcting glasses to colourblind visitors (e.g., Georgia O'Keeffe Museum, n.d.), and children's museums are increasingly offering sensory-friendly hours (e.g., Children's Museum of Pittsburgh, n.d.-b).

Moreover, some design choices made to support wider audience participation can enhance the museum visit beyond the targeted audience. For instance, modifications initially intended to accommodate special needs and multi-sensory accessibility typically enrich all visitors' experiences (Davidson et al., 1994; Hein, 1998; Hooper-Greenhill, 1994).

In addition to physical environment considerations, museum facilitators can draw upon a repertoire of techniques and strategies to responsively adapt and personalise their interactions to individual visitors' needs (Ash & Lombana, 2013; White et al., 2021). Unfortunately, out of fear of getting it wrong, evidence suggests that children's museum staff tend to step back from interacting with disabled visitors, signifying that even with a physically accessible exhibit, the environment as a whole might not be inclusive; however, training can equip staff and increase their comfort, thereby alleviating this concern (Golden & Walsh, 2013; see section 'Progressing Towards Resolution' above). Nonetheless, personalisation through facilitation must be implemented thoughtfully, especially as children's museums may have difficulty in retaining well-trained staff (Mayfield, 2005).

Caregivers in Family Visits

Some elements of an experiencescape can be, and typically are, pre-determined, such that the ensuing experience design decisions must be made around the foundational fixed decisions (Rossman & Duerden, 2019). Children's museums are museums that specifically cater to young children *and their caregivers* (see section 'What?' in Chapter Two). Thus, even though "visitors go to a children's museum expecting interactive experiences specifically designed for the size, interests, and developmental abilities of young children" (Falk & Dierking, 2013, p. 32), it is essential to also design the experience to support caregivers, particularly in the unique intermediate facilitating role that they play for their children and for the distinctive museum learning that they benefit from (see section 'Roles' above). In fact, a wealth of evidence from studies conducted in children's museums suggests that a variety of variables from each factor of the Visitor Experiencescape, as well as situational engagement, can influence caregivers' behaviours during and across a family visit: the visitor portrait (e.g., gender, subject familiarity or expertise, emotions (e.g., interest, enjoyment), museum visit experience, education attainment, culture: Fasoli, 2014; Gaskins, 2008; Haas, 1996; Siegel et al., 2007; Tenenbaum & Callanan, 2008; Wood & Wolf, 2010), the social situation (e.g., child-to-adult ratio; child's interests, gender, and age; child's bids or invitations to engage; museum staff facilitation: Braswell, 2012; Crowley et al., 2001;

Dooley & Welch, 2014; Gaskins, 2008; Letourneau, Meisner, & Sobel, 2021; Siegel et al., 2007; Wood & Wolf, 2010), the physical environment (e.g., exhibit arrangement or layout, exhibit size, exhibit labels, crowding: Gaskins, 2008; Letourneau, Meisner, & Sobel, 2021; Snow-Dockser, 1987; Vishkaie et al., 2021), and engagement (e.g., type of exhibit, play, and activities; exhibit or activity difficulty; engagement length: Braswell, 2012; Haas, 1996; Snow-Dockser, 1987; Wood & Wolf, 2010).

Serving an Intermediate Role

As captured by the Visitor Experiencescape, children's social situations influence their museum experiences. As part of children's social situations, caregivers can play a powerful supporting role during family visits (see section 'Museum Behaviours' above)—evidence suggests that caregiver involvement supports greater child museum learning (Crowley & Callanan, 1998; Gaskins, 2008; Puchner et al., 2001). Moreover, museums are informal educational environments (see Chapter One), and during educational experiences, it is up to "the educator to select those things within the range of existing experience that have the promise and potentiality of presenting new problems which by stimulating new ways of observation and judgment will expand the area of further experience" (Dewey, 1938/1997, p. 75). Thus, despite museum educators and facilitators engaging with visitors, "familiarity with the student's available store of experience is a necessary condition of pedagogical work" (Vygotsky, 1926/1997, p. 151), such that "parents are the adults best placed to provide customized scaffolding so that their child gets the most out of a museum visit" (de La Ville et al., 2021, p. 37). For instance, bringing with them knowledge of their child and how they learn, as well as an understanding of their child's abilities, interests, and motivations (see section 'Family Resources' above), caregivers are well poised to judge if an exhibit might be a good fit for their child's capabilities and interests (Gaskins, 2008). Additionally, the *style* of adult guidance impacts child museum learning (e.g., Haas, 1996), and evidence suggests that caregivers tailor their interactions depending on who from their family visiting group they are interacting with, their child's interests and knowledge, the way they know their child learns, *and* exhibit design elements (e.g., de La Ville et al., 2021; Thomas & Anderson, 2013; Palmquist & Crowley, 2007; Price et al., 2022). Through personalised support, when caregivers step into facilitating roles, the potential benefits of museum opportunities and children's engagement with them are likely to increase.

While family resources and family practices determine wider patterns of family visitation (see section '(Mis)match' above), caregivers take on a variety of roles (e.g., play partner, co-investigator) during and across their visits using observable behaviours (e.g., scaffolding, joint attention, elaborative conversational strategies). Some of these differences in caregiver roles and behaviours are informed by characteristics of their visitor portrait (e.g., culture: see section 'Equity' above), but others are derived from the setting itself (Bronfenbrenner, 1979; see section 'Roles' above) or the interaction between the two. For instance, moveable seating (e.g., physical environment) increases adult engagement at a children's museum exhibit, but only with young children (e.g., visitor portrait) (Gaskins, 2008).

It is imperative to acknowledge that caregiver-child interactions in the museum may be different from their general patterns in out-of-museum settings. For instance, caregivers do not always engage as freely as they do in the home (Shine & Acosta, 2000). While recognising the influence of family practice, this work primarily focuses on the museum experience (i.e., the microexperience) and, as a result, on caregivers' situational behaviours and their museum-setting roles. Conceptual considerations of the implications on family practice (i.e., the macroexperience) will be discussed in Chapter Nine.

Supporting Caregivers

Unfortunately, even when well-intentioned, caregivers are not always able to mediate between the museum and their children. For example, language and cultural capital barriers can prevent caregivers from being able to support their children's engagements and learn from exhibits (e.g., Archer et al., 2016; see section 'Equity' above). In addition, when parents do not have enough domain knowledge or exhibits lack proper directions, they report being unable to engage with their children as much as they would like to (Weiland, 2015). As a result, it is essential to acknowledge caregivers as both facilitators and learners during family visits to children's museum, such that "they too need to be supported and empowered in the interactive environment" (Lee, 2020, p. 96).

Without effectively communicating with visitors and supporting caregivers, the children's museum's full potential remains inaccessible (Lewin, 1989). Interactions between the museum and caregiver can, in turn, support the child's museum experience (Bronfenbrenner, 1979; Kupiec et al., 2023; van Schijndel et al., 2010). Because some visitor portrait characteristics are (re)defined throughout a museum experience (see section

'Microexperience' above), thoughtful design can anticipate misalignment and offer supports and guidance to bridge these gaps. For example, parents and child development experts hold different beliefs as to what type of learning, and to what extent, children's museum exhibits offer, but informational signage can reduce this gap (Song et al., 2017). Furthermore, providing caregivers with additional exhibit content and prompts supports them in effectively guiding and scaffolding their children's engagements (de La Ville et al., 2021; Price et al., 2022).

As well as explicit caregiver-directed support, elements of exhibits themselves can be designed to implicitly increase caregiver engagement. In fact, the triadic intersection of the Visitor Experiencescape illustrates that a child's museum experience depends on the social situation (e.g., caregiver facilitation) and the physical environment (e.g., museum supports), *as well as their interaction*. For instance, caregivers are more involved when children encounter difficulty with materials, they perceive materials to have a safety concern (Jung et al., 2023), their role is more obvious, and if children cannot complete activities themselves (Puchner et al., 2001). Finally, though some exhibits are designed to accommodate one user at a time, joint spaces increase the length and extent of engagement, child-caregiver interactions, and caregiver scaffolding (Dockett et al., 2011; Price et al., 2022; Vishkaie et al., 2021).

Museum Practice

Though it is the visitor's (inter)actions with(in) the museum that ultimately create each unique experience, experience design sets the environment and *influences* visitors' behaviours, engagement, and museum learning. The collection of intentional experience elements that museums draw upon and implement to create opportunities and provide support and guidance for their visitors, including physical design decisions and social facilitation techniques, as well as the theoretical approaches, culture, values, and museum learning goals that underpin them, inform a museum's visitor experience-focused *museum practice*. Future work comprehensively exploring museum practice is necessary in order to optimise the museum visit experience and, in doing so, maximise museums' positive impacts on their visitors and in their communities.

Conclusion

Learning, development, and growth depend on an individual's environment, social and physical, and their engagement with it. Consequently, though museum professionals

can intentionally set the stage for visitor engagement, museum learning is not determined by the potential of what *could* or even *should* be learned but rather by how visitors (inter)act with(in) the museum's opportunities as personally unique experiences. Moreover, a museum visit is not an isolated experience—it is set against the backdrop of an individual's life and personal history, beliefs and values, family resources and practices, and community and cultural milieu. Thus, and importantly, museum practice must consider how much (mis)match is present between a space and its occupants and work to close rather than simply bridge these gaps.

There is still much to understand about what, how much, and how best learning occurs in the distinct place of the children's museum and through the unique space it is experienced as by each visitor and family visiting group. To optimally inform museum practice and maximise museum learning during family visits, children's museum professionals and visitor studies researchers need to take into account a multitude of visitor and environmental factors, as well as their interactions. As outlined in this chapter, future work could benefit from applying the Visitor Experiencescape, acknowledging the unique child and caregiver role patterns during family visits, drawing on concepts from Social Learning Theory, and understanding both the function and limitations of experience design, with a particular emphasis on unpredictability and caregiver support.

Chapter 4

Methods

Introduction

Children's museums provide intentionally designed opportunities for family engagement and learning. As shown in the Visitor Experiencescape (see Figure 3.2), each visit experience is influenced by three factors, such that museums are challenged to cater to diverse visitor portraits, support the social situation of the visit, and construct an opportune physical environment. Oscillating between theoretical and conceptual review and empirical research and analysis, and by employing multiple methods, working within a reflective and responsive progressive focusing framework, and considering the perspectives of various stakeholders who contribute to and influence the children's museum family visit, this research aims to answer the following overarching research question: *How can American children's museums optimise their design and practices to maximise their contribution towards children's holistic growth during family visits?*

After reflexively addressing researcher positionality, this chapter presents the progressive focusing approach that was used to guide this work and then outlines and describes the methodological decisions made for the three empirical studies of the thesis.

Positionality: A Reflexive Statement

Positionality influences how a researcher comes to their work, the decisions they make at each step of the research process, and how they situate their work in the field (Holmes, 2020; Pring, 2014; Punch & Oancea, 2014). While this can have problematic consequences, "acknowledging the inevitable influence of lived understanding makes it more—not less—possible for fallible human beings to try and achieve rigorous knowledge of the social worlds they inhabit" (Kerdeman, 2015, p. 25). Qualitative research, in particular, must be conscious of researcher subjectivity when analysing data (Cohen et al., 2017), making reflexivity especially crucial. Life history influenced my choice to study informal educational environments. My mom suffered a brain injury that caused her to revert to a 4-year-old cognitively, emotionally, and socially. Her recovery illustrated to me first-hand the importance of context and interactions, as well as the individual nature of growth and development. More than that, to support her in "growing up" again, we relied on the power of informal experiences. Throughout her recovery, I was frustrated by the

information gaps around me. I knew that relevant knowledge and guidance must exist with helpful, if not transformative, potential; however, I was stymied by difficulty finding it as I sought to better understand how to support my mom. This further fuelled my earnest belief that research needs to become more accessible, both in its widespread availability and through findings that are relevant and made easy to understand and, when appropriate, implement.

Acknowledging these beliefs, and through ongoing reflexivity, my efforts towards minimising the influences of my biases are embodied through the progressive focusing, multi-study approach of this work (see section 'Progressive Focusing' below). While I am motivated by personal experience, rather than projecting what I think the benefits of a children's museum visit are or should be, this approach allowed museum priorities and beliefs to guide the research by representing their own goals (Study 1: mission statement analysis determining what construct I focused on) and explaining their own museum design and practices (Study 2: interviews with museum practitioners determining what optimisation efforts I focused on). Through maintaining a critical distance as a researcher (Biesta, 2007) while conducting consecutive studies that allowed the children's museum community to inform subsequent steps, rather than a priori beliefs and assumptions, this work endeavoured to appropriately reflect children's museums as they exist and function in their communities. In doing so, it strived to remain relevant and beneficial to children's museums and their visitors. Furthermore, the flexibility of this methodological approach allowed the work across the thesis to evolve, focusing on emerging insights and exploring them more deeply. This adaptability is manifest in the reflexive, reflective, and iterative way that prior research was engaged with and conceptual understandings built throughout the work, rather than having pre-committed to particular disciplinary approaches or systems of knowledge.

Progressive Focusing

Ecological validity is especially important in education research (Cohen et al., 2017). In fact, museum learning is contextually dependent (see Chapter Three), and, compared to a research laboratory, conducting research *in* museums allows a better investigation into the various factors that affect development (Callanan et al., 2015). Influenced by factors of both the social and physical environments, creativity is also contextually dependent (see Chapter

Six), and, therefore, must be studied in situ to be fully understood and, subsequently, enhanced (Amabile, 2017).

Museum research should start methodologically broad and open-ended, such that it can capture unanticipated outcomes and findings (Diamond, 1999; Preskill, 2011). Progressive focusing supports researchers in following this guidance by first identifying what is significant through a wide lens, then progressively focusing more deeply on findings to investigate further, as "one set of data analysis both precedes and informs what comes next" (Cohen et al., 2017, p. 46). The present research intends to identify the purpose(s) of children's museums visits—we need to know what an "effective" children's museum visit would mean before we can gauge what contributes to and could enhance it—and then explore how museum design and practices might be optimised to maximise these prioritised outcomes.

Voogt and Roblin's (2012) stepwise conceptual framework of intended curriculum, implemented curriculum, and attained curriculum was adapted to intended practice, implemented practice, and *informing* practice to support the present goals of not only understanding "what is", but also seeking to optimise "what could be", in order to contribute to maximising children's learning. The choice to adapt the term "curriculum" to "practice" reflects that, while there is no required curriculum for visitors to adhere to during their museum visits (see section 'Why?' in Chapter Two), museum decisions and the perspectives that underpin them do constitute purposeful experience design—their museum practice (see section 'Museum Practice' in Chapter Three). This work investigates institutional *intended practice* through mission statement analysis, explores museum professionals' *implemented practice* through semi-structured walking interviews, and examines caregiver perspectives and understandings to contribute towards *informing practice* through an online survey. This multi-step process of research not only naturally builds on the findings that have come before it, but it also captures different stakeholder voices (i.e., institutional, museum professionals, caregivers). The use of multiple methods allows for a deeper investigation, and exploring multiple perspectives helps build more complete understandings (Diamond et al., 2016). In addition, the multi-study progressive focusing approach allows the empirical work to be punctuated with literature, conceptual understandings, and theoretical framing as the focus narrows. As such, this work oscillates

between building on empirical findings and deeply diving into literature to strengthen understandings and inform further investigation. (See Figure 1.1)

The following sections describe the series of three studies conducted in this thesis and show how the progressive focusing approach has been used throughout. The methods of each study are summarised within later chapters as part of the Integrated Thesis format. However, for the first study examining intended practice through a mission statement analysis, the published paper was able to comprehensively discuss and provide rationale for the methods, and there were no amendments needed to the design and methods while conducting this study. As such, they will not be repeated in this chapter and can be found in Chapter Five (Kupiec, 2024). In addition, for the third study, which utilised a survey of various item types, it was essential to retain the full data analysis section within Chapter Eight; thus, this section will be abbreviated in this chapter rather than repeated in full.

Study 1: Intended Practice

According to Wardrip and Brahms (2020), the success of an informal learning experience lies at the intersection of three key elements: the purpose of the experience, the physical space and tools/materials within it (i.e., pieces and parts), and the supporting role of others (i.e., people). Moreover, the authors suggest that the purpose contributes to determining the nature of the other two elements in practice. Thus, understanding the goal(s) of an informal learning experience is the starting point in designing to effectively achieve them. It follows, then, that the first step of this research was to determine children's museums *intended practice*.

As stated above, the full methods can be found in Chapter Five (Kupiec, 2024).

Informing Study 2

Findings from the mission statement analysis in Study 1 contributed to the development of Study 2 in substantial ways. Firstly, a key finding from the frequency analysis in Study 1A is that children's museums prioritise the Lifelong Competency of creativity. Following the progressive focusing approach, this finding informed the conceptual focus of the subsequent work. Thus, Study 2 narrows in on examining creativity. Secondly, the thematic analysis in Study 1B provides insight into the "how" and "why" of intended practice for achieving creativity. However, museum mission statement intentions are not always implemented in practice. More information is needed to understand the perspectives of museum professionals, including their conceptions of child creativity, their

creativity-related design and practices that reach the museum floor, and their recognition of visitors' creative engagements and generativity in response to the opportunities they offer. As a result, Study 1 findings provided the starting point for creativity-focused, semi-structured walking interviews with museum professionals in Study 2, targeting *implemented practice*, and, alongside literature, informed the thematic interview schedule used for data generation (see section 'Data Generation' below) (see Appendix B).

Study 2: Implemented Practice

Research Aims

Study 1 (see Chapter Five, Kupiec, 2024) findings show that children's museums *prioritise* creativity and intend on achieving this goal through a variety of environmental and experiential features. However, museum mission statement intentions do not necessarily reflect implemented reality. For example, zoos that include conservation in their mission statements do not always engage with these efforts, while those that do not include conservation may still engage in conservation efforts (Maynard et al., 2020). Moreover, while emerging evidence has suggested that museum visits might enhance children's creativity (Gong et al., 2020; Gregoriou, 2019), it takes intentionality to enhance creativity (e.g., Amabile, 1998). Unfortunately, little is known to date about creativity during children's museum visits, including which museum design and practice elements effectively enhance it during family visits.

Although nearly all children's museums report conducting some form of evaluation or research, most studies examine visitors, and few collect data from museum staff (Luke & Windleharth, 2013). However, through experience design, the staff are integral in setting the stage for visitors' museum experiences. In fact, according to Schauble and Bartlett (1997):

> An important lesson from classroom studies is that studying forms of student learning often makes little sense without studying forms of teaching. The implication is that to take learning seriously as a goal, museums will need to become much more self-conscious and systematic about developing and studying the varieties and forms of mediation that they provide and/or shape. (p. 790)

As a result, Study 2 seeks to explore children's museums' *implemented practice* by examining how children's museum professionals (i.e., educators, designers, and executive directors) define, design for, and identify creativity during family visits, as well as which

aspects of visitors' experiences support and/or hinder children's creativity. Through semi-structured walking interviews with museum professionals, this study aims to answer the following research questions:

RQ5: What do children's museum professionals believe makes the children's museum a unique place?

RQ6: (How) Do children's museum professionals define child creativity?

RQ7: (How) Is children's creativity supported and/or hindered at children's museums?

RQ8: (How) Do children's museum professionals identify and/or measure child creativity?

Participants

Much of what we know about children's museums comes from research disproportionately conducted in a select few children's museums, which tend to be larger (Luke & Windleharth, 2013). However, nearly half of children's museums have an annual budget of less than $1 million (Luke et al., 2021). Organisational size and budget could have implications on museum design and practices, such as the number, variety, and layout of exhibits; the size of staff and number of facilitators available to interact with visitors; the ability to provide a variety of materials and activities; programming and outreach efforts; the capacity to do evaluation work; and community visibility and visitor type (e.g., frequent local versus one-stop tourists). Additionally, even when children's museums share goals, they may implement these differently (Mayfield, 2005). Acknowledging these differences and their potential impacts, stratified purposive sampling was used to ensure representation of children's museums across several key variables: children's museums of various levels of funding and size, from different geographic regions in the United States, and those that include creativity in their mission statements and those that do not.

Potential participants were contacted via email through email addresses listed on their employing museum's webpage. Initially, participant eligibility criteria limited participation to one museum professional per children's museum in order to generate data that reflected a greater number of children's museums' design and practices. However, replies to recruitment emails were low; the recruitment plan was adjusted such that after a participant agreed, snowball sampling was used within each museum to recruit additional participants. In total, the participant group was made up of 12 museum professionals from

six American children's museums. Five of these children's museums are identified as such on the Association of Children's Museums' "Find a Children's Museum" website (Association of Children's Museums, n.d.-b). The sixth children's museum has "children's" in its museum name and represents a children's museum in both its mission statement and exhibit provision (e.g., makerspace, water table, pretend play market and kitchen). Each participant was employed for at least one year by their institution and served as the executive/site director or held a role connected to education and visitor engagement or exhibits and design. Due to the distinctive job titles that some participants held and to protect participants in remaining unidentifiable, specific roles are not reported beyond categorisation. (see Table 4.1)

Table 4.1

Characterising Variables of Participants and Their Employing Children's Museum

Participant		Museum			
ID	Role categorisation	ID	Size	US region	Creativity in mission statement
0101	Education	1	Large	Northeast	Yes
0201	Executive director	2	Medium	Northeast	Yes
0202	Education	2	Medium	Northeast	Yes
0301	Education	3	Medium	Midwest	No
0302	Exhibits and education	3	Medium	Midwest	No
0401	Exhibits and education	4	Large	Midwest	No
0402	Exhibits	4	Large	Midwest	No
0501	Exhibits	5	Small	South	No
0502	Education	5	Small	South	No
0503	Site director	5	Small	South	No
0601	Exhibits	6	Large	South	No
0602	Education	6	Large	South	No

Children's museum size was determined according to categorisation criteria by Barchas-Lichtenstein et al. (2017). In the first instance, publicly available annual reports and financial statements were used to categorise each children's museum by the total operating expense criteria, as one of the reasons for ensuring inclusion of various sizes was that budgets might translate into different abilities to realise implemented practices. In one case,

where a document that reported total operating expenses was not found, staff size was used as the criteria for determining museum size. (see Table 4.1)

Data Generation

A semi-structured interview was conducted individually with each participant at the children's museum they worked at. Semi-structured interviews were selected because they ensure systematic data collection across participants by deciding themes before data collection begins, while also allowing the researcher to adapt the flow and question format throughout the interview (Patton, 1980, as cited in Cohen et al., 2017). As such, the researcher can respond to each participant's unique context and use prompts and probes to gain greater clarity and deeper understanding. Semi-structured interview questions are also open-ended, allowing for unpredictable but insightful responses to be captured (Cohen et al., 2017). In these ways, semi-structured interviews are appropriate for this research because the major themes have been informed by mission statement analysis and literature review, but each children's museum has its own unique context, resources, and exhibits.

The thematic interview schedule (see Appendix B) included information about the participant, the uniqueness of children's museums and how they benefit their communities, defining child creativity, creativity's value and place in the children's museum, how central creativity is in design and staff discussions, factors or conditions that support and/or hinder creativity during visits, how creativity is expressed during children's museum visits, and whether the children's museum conducts any creativity-related evaluation. Though participants occasionally spoke about other types of visits (e.g., field trips, camps), the interviews were focused on family visits.

Information about the participant was collected to better understand each participant's role at the museum and ensure they met the criteria of having worked at the children's museum for at least one year. The remaining themes and topics to be covered in each interview were derived from literature and the findings of Study 1.

Questions about the uniqueness and benefits of children's museums were informed by literature suggesting misunderstandings about children's museums (see Chapter Two; see Chapter Three). Questions aiming to understand how children's museum professionals conceptualise and value children's creativity—including how they define child creativity, personally and institutionally; how important they believe creativity is to their design, practice, and visitors' experiences; and how creativity is discussed among staff—were

informed by literature. This body of literature includes research suggesting that creativity is difficult to define but often personally and implicitly understood (e.g., Amabile, 1996; Plucker et al., 2004), as well as work highlighting common myths about creativity (e.g., it is only for some people, it is mostly for art-related activities, it is not malleable: Robinson, 2009) (see Chapter Six; see Chapter Seven). This theme was also informed by prior research that has identified misalignment between museum mission and practice (e.g., zoos: Maynard et al., 2020) and that children's museums leave play largely undefined, despite its central role (Luke et al., 2021). The question prompting participants to share their beliefs about how children's museums enhance children's creativity was informed by Study 1 findings, which revealed that children's museums aim to nurture creativity rather than merely support it during the visit. Additionally, Study 1 findings indicated that learning is central to museum mission and that creativity is viewed as a mediator for museum learning, and evidence suggests that creativity is positively associated with academic achievement (e.g., Gajda, Karwowski, & Beghetto, 2017); therefore, this link was included for exploration. The topic of creativity-specific orientation efforts was informed by evidence that visit orientation is helpful for visitors, particularly those without prior museum experience, and that visitors' agendas and motivations influence their visits (see Chapter Two; see Chapter Three).

The interview theme that aimed to examine how creativity is expressed by visitors in the children's museum and which museum factors or conditions support and/or hinder creativity was informed by factors of the Visitor Experiencescape (see Figure 3.2), findings from Study 1 suggesting how children's museums intend to achieve creativity (see Chapter Five, Kupiec, 2024), factors of the CLOVER (see Figure 6.1), and the relationships between these (see section 'Children's Creativity in Context' in Chapter Six). The choice to specifically ask about creativity-supporting *and* creativity-hindering factors was further informed by literature suggesting that obstacles to creativity are easier to identify (Hennessey & Amabile, 1987). Finally, the infancy of the field of museum research, particularly in examining Lifelong Competencies, informed the theme that focused on creativity-related measurement and evaluation practices.

Interviews consisted of two components. The first was stationary and the second was a walking interview led by the participant through the museum. While themes did tend to organically arise and get discussed across these components, the stationary portion of

the interview was generally focused on conceptual and less exhibit-specific topics, such as the uniqueness of children's museums, defining child creativity, and creativity's place in the children's museum. On the other hand, the walking interview component was largely focused on exhibits, including design approaches and materials, visitor (inter)action with(in) them, and how various factors support and/or hinder creativity.

Walking interviews were chosen because in sit-down interviews, "talking becomes the center of attention" (Kusenbach, 2003, p. 462); however, museums are made up of exhibits, which are physical areas (see section 'Where?' in Chapter Two). Environmental cues also support interviewee recall with less interviewer prompting (Carpiano, 2009; Evans & Jones, 2011). As a result, the walking interview format allowed the museum to support in guiding the interview, meaning that participants were able to discuss features of their spaces via environmental prompts rather than solely relying on interviewer prompts and probes. This was important for data generation because all children's museums are unique, such that the interviewer had less knowledge about the individual spaces and exhibits. Furthermore, walking interviews allow researchers to "access people's attitudes and knowledge about the surrounding environment" (Evans & Jones, 2011, p. 850). In fact, previous research conducted in science museums has shown that during sit-down interviews, museum professionals tend to focus more on cognitive learning processes, but during exhibit tours, they highlight social interactions, design and exhibit characteristics, and affective elements of engagement and learning, often emerging anecdotally (Shaby et al., 2016). This substantiates the value of utilising a walking interview format for the present focus on creativity because an individual's environment, both social and physical, and affective-conative states are important factors of creativity (see Figure 6.1).

Both key elements of the interviews (i.e., semi-structured and walking) ensured that this research could gather the information needed to answer the research questions and build a thick description from which to best understand children's museums' creativity-related design and practices, while allowing for flexibility to remain sensitive to each individual museum's unique context and the different ways of asking that this might necessitate. As these interviews were conducted throughout each participant's children's museum, they were audio-recorded with wireless microphones. This allowed for ease of movement within the museum spaces without sacrificing context or data. To ensure that the equipment would be able capture the interviews, before any interviews were

conducted, the equipment was tested by recording conversations with several different people in a variety of public settings. This included while walking through a botanical garden as a pilot of a public museum space.

Prior to beginning each interview, participants were provided with information sheets that explained the study, their participation, and how data would be stored (see Appendix C); had the opportunity to have any questions answered; and completed consent forms, which included consent to participate and to be audio-recorded (see Appendix D). In addition, participants were given the option to grant permission for the use of unidentifiable quotes from the interviews in research outputs or to choose not to be quoted. All participants gave consent to be unidentifiably quoted for the purposes of this work.

An important limitation that must be considered in the semi-structured interview format includes the interviewer accidentally neglecting to cover all topics (Patton, 1980, as cited in Cohen et al., 2017). As a best effort to prevent this from happening, before any interviews took place, variations of the wording and flow of the topics to be covered during interviews were rehearsed until the thematic interview schedule felt comfortably familiar and conversationally fluid. Due to time gaps between interviews because of slow participant recruitment, this rehearsal occurred again immediately preceding each children's museum visit and set of interviews.

When conducting walking interviews, it is not feasible to eliminate or control for the possibility of interruptions and/or distractions (Cohen et al., 2017). During the walking portion of the interviews, some participants were interrupted by other staff or visitors. These interruptions were brief and did not interfere with interviews. One interview did need to be paused shortly after the walking portion began due to a severe weather warning; it was continued as soon as it was safe to reenter the exhibit spaces. This interruption did not appear to affect the participant's engagement or the conversation.

Data Analysis

Interview audio files were uploaded to the web version of Microsoft Word (Microsoft Corporation, n.d.), and the automatic transcription feature was used. Each audio file was then carefully listened to multiple times as edits were made. Where an interview had been interrupted by a visitor or staff member, these exchanges were not transcribed, as they had not consented to being recorded. Each de-identified transcript was imported into NVivo (QSR International Pty Ltd., 2018) for analysis.

Interviews were analysed through thematic analysis, inspired by Braun and Clarke (2006, 2019). Notes were made after interviews to capture preliminary thoughts and prominent ideas, particularly ones that were unexpected or had not been mentioned previously, as a way to reflect on whether saturation had been attained. After thorough data familiarisation through the transcription process, detailed notes were again taken to capture reflections on the data and highlight initial patterns. Then, several rounds of coding were completed. Coded excerpts varied in length and could be assigned multiple codes. These decisions were made to ensure that meaning and context were retained, without losing important insights. Additionally, aspects of both inductive and theoretical thematic analysis were applied (Braun & Clarke, 2006). For example, structured coding was used to identify predefined elements from the data (e.g., child creativity definitions, museum evaluation techniques) and then, within each of these topics, the data was inductively coded for a more nuanced understanding that developed through the coding process. In addition, open coding was inductively applied to the full data set to build thorough and inclusive understandings, to analyse the less defined aspects of the interviews (e.g., exhibit features, factors that support and/or hinder creativity), and to answer the more exploratory research questions.

Due to the nature of the walking interviews, participants sometimes referred to specific components of an exhibit or the museum without verbally describing them. Consequently, latent reflexive coding was used to go beyond the semantic level of the data, drawing on the researcher's memory to interpret and contextualise these references. Examples of this include a participant gesturing to an art-themed exhibit and stating, "and then obvious creativity and exploration" [Participant 0601] and a participant showing a material in an exhibit and, referring to an initial response in the sit-down interview, stating, "these are those blocks I was talking about" [Participant 0201]. Reflexively incorporating such shared understandings built over the course of each interview was important in gaining meaning and in coding the data. For memory support, the coding process was supplemented by reviewing photos on museum webpages and those who individuals had uploaded to Google for the public to view when searching for specific places. As a result of the importance of the coder having shared the same space and time as the participant during data generation for meaningful coding, it was not feasible for multiple coders to code portions of the dataset to discuss emergent codes or establish inter-rater reliability.

An iterative coding process was used to revisit and refine codes across the data. The first round of coding generated and applied initial codes across the full set of data, and a second round was performed to ensure that all codes generated during the coding of later transcripts had been fully considered throughout the entire set of interviews. The next step was reflecting on the codes generated to construct themes, and the codes were grouped by these initial themes. The entire dataset was revisited to focus on one theme at a time. In reviewing each theme, some codes were merged, while others were re-coded or split into more specific codes for a greater depth of analysis and higher conceptual density, from which to build rich understandings. This formed a hierarchy of several levels of codes within each theme. It was also determined that some codes better belonged under a different theme, and adjustments were made. The coding framework was exported from NVivo and refined, and clear names for themes, sub-themes, and codes were generated. See Appendix E for the resulting coding framework that was developed through this process.

It was clear that some of the most significant themes were not widely discussed, and quantification would have obscured their significance and reduced the thick description gleaned from analysis. Direct quotations that represented the themes were identified, and these are used to illustrate the findings of the analysis (Eldh et al., 2020). Finally, the data was examined for discrepancies within and between participants and within and across institutions, while also considering museum size and whether "creativity" was included in a museum's mission statement. This was followed by final interpretation and reporting.

Informing Study 3

Studies 1 and 2 suggest that not only do children's museums prioritise creativity (see Chapter Five, Kupiec, 2024), but they also provide well-designed opportunities for children's creative engagement (see Chapter Seven). However, caregivers also significantly influence children's engagements, including their creativity, during children's museum family visits (see Chapter Three; see Chapter Seven). In fact, creativity is shaped by an individual's physical *and social* environments (see Chapter Six). Findings from Study 2 (see Chapter Seven) further suggest that mobilising caregivers to enact mindful behaviours during family visits may be one promising avenue to maximise the benefits of children's engagements with and experiences of creativity-enhancing opportunities at the children's museum. As a result, and following the progressive focusing approach to narrow the work once again, Study 3 focuses on caregivers. It does so by exploring caregivers' perceptions, expectations,

and beliefs of children's museums and an adult's role during visits; their views of the children's museum as an opportunity for creativity; their understandings of creativity-related information, motivation, and behavioural skills; and what and how they might like to learn about child creativity. To address these aims, Study 3 uses a survey designed to explore *informing practice,* seeking to contribute to the effective design and acceptable delivery of appropriately optimised caregiver-directed support.

Study 3: Informing Practice

Amending Study 3

Study 3 was originally designed to be an intervention (see Appendix F). However, after intervention design and ethical approval, high rates of incidence and spread for several viruses alongside personal health considerations led to the need to pivot the proposed research out of the museum and to an online format. The caregiver questionnaire designed as part of the data collection for this intervention (see section 'Data Collection Instruments' in Appendix F; see section 'Caregiver Questionnaire' in Appendix F) (see Appendix G) was redesigned for elicitation research hosted on Qualtrics. In addition, nonvisitors are distinctly unique from visitors (see Chapter Two; see Chapter Three) but typically understudied across the museum field, as museum research is often conducted *in* museums. Importantly, the shift to an online survey with recruitment outside of a museum setting provided an opportunity to endeavour to capture the perspectives of visitors *and* nonvisitors.

Research Aims

Findings of Study 2 suggest that the most promising avenue to enhance children's creativity during family visits to children's museums may lie in mobilising caregivers and supporting them in enacting mindful behaviours. However, it remains unclear *why* caregivers might not be (inter)acting with(in) their children and the museum using creativity-enhancing mindful behaviours, particularly in environments that are well-designed for creativity.

Caregivers' understandings and beliefs can influence their in-museum behaviours and, in turn, their children's creativity. However, many adults do not have personal experience visiting children's museums as children themselves and, as a result, may not understand or appreciate their purposes or opportunities for engagement (Mayfield, 2005) (see section 'External communication' in Chapter Five, Kupiec, 2024). Interactions between the museum and caregivers can support children's experiences (Bronfenbrenner, 1979;

Kupiec et al., 2023; van Schijndel et al., 2010). While caregivers can benefit from different types of guidance and support during family museum visits, these are not always equally accepted and acted upon. Without effective communication with visitors and support for caregivers, the children's museum's full potential remains inaccessible (Lewin, 1989). Moreover, for museums to provide support typically requires that it is offered in low-cost, light-touch, and quick ways.

Guided by Study 2 findings and framed by wise interventions (Walton & Wilson, 2018), the Information-Motivation-Behavioral Skills (IMB) behaviour change model (Fisher & Fisher, 1992), and intervention acceptability and opportunity (Casale et al., 2023), this study aims to contribute to the development of creativity-specific support that caregivers would be most likely to accept and act on. To do so, this study will examine caregivers' perspectives on children's museums and creativity and identify which of their beliefs and understandings might be most effectively targeted to positively change their creativity-related behaviours during family visits. Through an online survey with caregivers, Study 3 seeks to contribute to *informing practice* by answer the following research questions:

RQ9: What beliefs and expectations do caregivers of children aged 5–8 years hold about children's museum priorities and engagement?

RQ10: What do caregivers of children aged 5–8 years believe about children's museums as an opportunity for creativity?

RQ11: How do caregivers of children aged 5–8 years define child creativity?

RQ12: What degree of creativity-related information, motivation, and behavioural skills do caregivers of children aged 5–8 have?

RQ13: What type of intervention might caregivers of children aged 5–8 years most accept in supporting their children's creativity?

RQ14: (How) Do the perceptions of caregivers differ by museum visit experience (i.e., frequent visitors, occasional visitors, nonvisitors), the pedagogical approach of their child's school, their gender, their educational attainment, and their race?

Survey (Re)development

The post-observation caregiver questionnaire developed as part of the intervention initially designed for Study 3 (see section 'Caregiver Questionnaire' in Appendix F) (see Appendix G) became the starting point for this study's caregiver survey; however, it underwent key changes and additions to meet the present purposes.

General questions about museum visitation habits were retained from the initial questionnaire as the first set of survey items, such that responses could be used to determine whether participants were nonvisitors, occasional visitors, or frequent visitors.

To better understand what caregivers believe the purposes of a children's museum are, whether these differ between visitors and nonvisitors, and how these perceptions may (mis)align with the institutional purposes of children's museums, an item was added asking participants to rank nine of the 12 terms appearing in at least 20% of children's museum mission statements (see Chapter Five, Kupiec, 2024) in order of the most important reason for a children's museum visit. Of the three terms not included for this ranking, "child" and "experience" were excluded because they are inherent to describing a children's museum visit and do not represent specific reasons to visit. "Lifelong" was excluded because the focus of the work was on understanding the expectations and roles related to the in-museum experience, including caregiver behaviours and family interactions during visits.

Next, to explore caregivers' perceptions of what is most important about a children's museum visit and their role during it, including whether they feel it would be their responsibility to interact with their children and/or be mind-on, two items asked participants to select the top three most important options from a list of nine. The first question, selecting the most important things about a children's museum visit, was adapted from the original questionnaire item regarding visit motivation, as the survey was not in relation to any museum visit. The second question, selecting the most important roles for an adult during a children's museum visit, was informed by museum and creativity literature (see Chapter Three; see Chapter Six), as well as Study 2 (see Chapter Seven) findings of what museum professionals reported caregivers doing during family visits.

Evidence suggests that it is not the museum itself and its offerings that prevent some from visiting but rather the ambiance, physical comfort, visitors' confidence to manage the experience and its "museum code", and visitors' sense of belongingness or feeling welcomed (Hood, 1983/2007). Particularly with the intention of comparing visitors and nonvisitors by collecting data with an online survey not associated with a museum or museum visit, the next set of items asked participants to select how strongly they agreed or disagreed with one statement measuring familiarity with children's museums and nine statements about creativity and play at children's museums, for both children and adults. These items aimed to understand caregivers' recognition of opportunities for creativity. This

section was an adaptation from those previously developed regarding comfort, belonging, and opportunity, as well as perceptions of creativity during exhibit play. Wording was carefully chosen to ensure that these items would be answerable by both those who have visited a children's museum and those who have never visited one. The response format was a 4-point Likert scale of (dis)agreement: strongly disagree, disagree, agree, strongly agree.

Items addressing creativity unrelated to the children's museum visit were retained from the original questionnaire. As such, caregivers were first asked to define child creativity before completing the items informed by the IMB model. This choice to have participants define child creativity first was kept as an effort to mitigate potential influence from creativity-related understanding statements on their responses. After defining child creativity, a list of items sought to better understand caregivers' understandings of creativity-related information, motivation, and behavioural skills. The original items were retained from the previous questionnaire, and additional items were developed from the literature (see Chapter Six). In total, 30 statements using the original 4-point Likert scale of (dis)agreement response format were randomised for inclusion in the survey: 11 information statements (six to be reverse coded), nine motivation statements (three to be reverse coded), and 10 behavioural skills statements (three to be reverse coded). These items were developed to examine which areas of support caregivers may most benefit from. See Appendix M, Table M1 for an indication of which creativity-related IMB statements belong to each of the three constructs and which were reverse coded.

Another section was added to the initial questionnaire. Literature review identified a wealth of evidence that suggests families benefit from different types of guidance during their museum visits and that creativity is influenced by a variety of factors (see Chapter Three; see Chapter Six). However, though many different types of guidance are offered by museums, not all of these efforts or their implementations are equally beneficial or feasible (e.g., Benjamin et al., 2010; Letourneau, Meisner, & Sobel, 2021; Willard et al., 2019). As it would be valuable for children's museums to know how to spend limited institutional resources most efficiently without sacrificing potential benefits, this literature informed three questions. Caregivers were first asked to report on how much they would like to learn more about child creativity. Then, two rank-order items were used to explore what and how caregivers might like to learn about child creativity.

Finally, sociodemographic items were retained, with the addition of asking caregivers what school their child attends. This was added because evidence suggests that the pedagogical approach of a school influences children's scores on creativity tests (Besançon & Lubart, 2008; Denervaud et al., 2021; Segundo Marcos et al., 2020; Segundo-Marcos et al., 2024). However, little is known about caregivers, who may intentionally select different schooling approaches to enrol their child(ren) based on their perceptions and knowledge of pedagogical approaches, including towards creativity, which could influence, or be influenced by, how caregivers view and support their children's creativity. As in the previous questionnaire design, this information was collected at the end of the survey to help reduce the effects of respondent survey fatigue, with the reasoning being that sociodemographic items have become typical on surveys and their responses would likely be more automatic, meaning that they would be less susceptible to survey fatigue.

Initial feedback on each section came from one individual who had provided very helpful feedback during a cognitive interview as part of the previous caregiver questionnaire design (see section 'Caregiver Questionnaire' in Appendix F). With this information, edits were made to the items for clarity, and a Qualtrics survey was created. Five cognitive interviews were conducted with individuals that had *not* participated in previous cognitive interviewing. This included both individuals who had been to a children's museum and those that had not, to ensure that the questions about children's museums made sense to, and were able to be answered by, both visitors and nonvisitors. This step resulted in fine-tuning select word choices, but the items themselves and the types of information they were gathering were unchanged. Finally, the "Document stats" function within the "Editor" pane of Microsoft Word (Microsoft Corporation, 2021) was used to verify that the reading level of the questionnaire items was 8 or below. For the function to consider all statements as part of this measure, periods were added to response options where they are not present in the online questionnaire. Altogether, the survey items had a Flesch-Kincaid Grade Level of 6.9. With the inclusion of the participant consent information, the overall Flesch-Kincaid Grade Level was 7.9. (See Appendix N)

Participant Recruitment

To be included in this study, adults needed to be at least 18 years old; the parent, guardian, or regular caregiver of at least one child aged 5–8 years; and reside in the United States of America. The initial recruitment plan was to have the participant recruitment flyer

(see Appendix O) distributed by schools and teachers, electronically or physically. This recruitment plan was developed as a way to access the full diversity of individuals within a community and purposefully conduct recruitment at schools with different pedagogical approaches. However, this was a difficult avenue for recruitment and required amendment. Instead, potential participants were approached by sharing an electronic and/or a physical version of the recruitment flyer with existing familiar acquaintances (e.g., friends, neighbours, family members), who were invited to take part in the current study and/or share the information within their own networks.

Data Collection

Data was collected via an online survey hosted by Qualtrics, which took approximately 15 minutes to complete. Informed consent was obtained from participants on the first page of the survey link. Participants had to select "yes" to confirm that they met the criteria, understood that they could withdraw during the survey, understood that they would not be identifiable if they participated, and that they consented to take part. If "no" was selected for any of the responses on the information and consent page, the participant was automatically sent to the final survey page thanking them for their time. Participants could withdraw from the study at any time by closing the web browser or Qualtrics tab. Qualtrics was set to not record incomplete responses, such that withdrawing automatically removed all data. Once the survey was completed, the withdrawal of data was not possible, as it was recorded by Qualtrics de-identified and anonymous, and IP addresses were not recorded.

Participants

In total, 85 response entries were recorded by Qualtrics. Four entries were removed because the survey automatically ended after the consent and inclusion criteria page was completed, as these individuals indicated "no" to being the parent, guardian, or regular caregiver of a child aged 5–8 years. The final sample size for this study is n = 81.

Data Analysis

As stated above (see section 'Progressive Focusing'), due to the diverse item types and question formats used, the full data analysis of this study can be found in Chapter Eight and is abbreviated here.

Survey responses were exported from Qualtrics to Microsoft Excel (Microsoft Corporation, 2024). Ranking items were analysed in Microsoft Excel by calculating the mean

and standard deviation of each item option's ranking across participants. The countif() function in Microsoft Excel was used to identify how many times each item was ranked at each rank-order value. For items in which participants were asked to select the top three options from a list of nine, a column for each response option was created and a "1" was entered if it was one of the options chosen by a participant and a "0" if it was not. The countif() function was used to identify how many times "1" appeared for each option.

Likert scale item responses were recoded with equidistant numerical values centred on zero: a response of "strongly disagree" was recoded to -1.5, "disagree" to -0.5, "agree" to 0.5, and "strongly agree" to 1.5. Information, motivation, and behavioural skills items necessitating reverse coding were recoded. Across all information, motivation, and behavioural skills statement responses, there was one missing value. The empty cell was replaced with the mean of the other 80 participants' responses for that item. The mean for items using the Likert scale response format to explore caregivers' familiarity with children's museums, their beliefs about the children's museum as an opportunity for creativity, and whether they would like to learn more about child creativity were calculated in Microsoft Excel. To analyse and compare participant responses to information, motivation, and behavioural skills statements, data was exported from Microsoft Excel and analysis carried out in RStudio (RStudio Team, 2022). The mean score for each item was calculated. Then, the mean score for each of the three IMB categories was calculated, and an ANOVA was conducted to examine whether these differed significantly from each other.

Definitions of "child creativity" were imported into NVivo (QSR International Pty Ltd., 2018) for analysis. One participant chose not to define "child creativity", resulting in a total of 80 definitions for analysis. Thematic analysis was performed, inspired by Braun and Clarke (2006; 2019). See Appendix P for the coding framework developed through this process.

Due to the small sample size, a relatively homogenous and skewed participant group, and inconsistent responses about museum visitation, analyses were unable to be conducted to explore differences between subsets of participants (RQ14).

Ethical Considerations

The present research has been conducted with multiple methods, and considerations have been made at each step to protect participants and their data. Data collection has included public material (i.e., mission statements), semi-structured interviews

with museum professionals, and online surveys completed by adults. Necessary ethical applications and amendment applications were completed and approved by the Central University Research Ethics Committee (CUREC) at the University of Oxford before collecting data at each stage of research (Ethics References: CIA-2223-010 (Study 2) and EDUC_C1A_23_346 (Study 3)). See Appendix Q for approval letters.

Participation for all interviews and surveys was voluntary, with informed consent obtained from each participant prior to participation. Participants were further able to end the interview or survey at any time, and data was de-identified and securely stored in line with University recommendations and regulations.

Additionally, education researchers must regularly revisit and reflect on ethical matters throughout the course of their work, including considerations of situational context (Burgess, 1989; Cohen et al., 2017). As such, I continued to actively engage in ethics discourse, flagged and discussed situational considerations as they arose, submitted amendments for ethical approval when changes to research design were needed, and kept an eye on participant wellbeing.

Chapter 5

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What American children's museum mission statements say about Lifelong Competencies

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Abstract

Children's museums are a distinct type of museum—one particularly poised to engage and support the development of Lifelong Competencies that will help children live into their own successful and fulfilling futures. Understudied in the children's museum, which one(s) they prioritize is largely unknown, and, thus, so is their optimization. This work draws upon the important communication tool of institutional mission statements. Frequency analysis of the terms in 321 American children's museum mission statements (Study A) identified that children's museums prioritize the Lifelong Competencies of creativity and curiosity. Thematic analysis of the 119 mission statements that included these terms (Study B) indicated that children's museums' intended practice for achieving creativity and curiosity is through experiences, environments, and play with a focus on hands-on and interactive elements, family-friendly features, eliciting a positive affect, and experiences that are educational and innovative. Furthermore, creativity and curiosity are primarily valued as mediators toward learning.

KEYWORDS

children's museum, creativity, curiosity, Lifelong Competencies, mission statement

INTRODUCTION

The field of museum research encompasses a broad and diverse collection of informal educational environments, including those where the focus of the visit, and thus anticipated learning

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outcomes, tend to have a high degree of domain specificity in *what* is exhibited (e.g., natural history museums, science centers, botanical gardens, zoos). However, specifying *who* the museum is for, *children's museums* are a distinct type of museum, and, therefore, so are their outcomes, learning processes, and audience (Luke & Windleharth, 2013).

Much of what is currently known about children's learning from museum visits is limited to knowledge gains (Luke & Windleharth, 2013), which could be a result of museum research funding that prioritizes informal *science* learning (Anderson & Mileham, 2020). While a focus on content has provided valuable insight for the field, a lack of evidence does not indicate irrelevance—knowledge gains are not the only outcomes of a museum visit (Hooper-Greenhill, 2004). This is especially true of the children's museum. For example, despite a near absence of research into social and emotional growth during children's museum visits, children's museum professionals consider these to be some of their most prominent outcomes (Luke & Windleharth, 2013). Moreover, evidence suggests that parents naturally see more "nonacademic educational" (e.g., people's feelings, cooperative play, creativity, and physical) than "academic" (e.g., math, science, history, language) value in children's museum exhibits (Song et al., 2017). While the field is beginning to investigate benefits unrestricted to knowledge gains (e.g., Luke et al., 2022), to more wholly understand and optimize the ways in which children's museums contribute to their communities, it is important to recognize which outcomes, aside from content knowledge, they position themselves to support, as well how they intend to achieve them and why they are valued.

Beyond content knowledge

Children need more than content-centered knowledge to be successful (Golinkoff & Hirsh-Pasek, 2016). Whereas knowledge workers thrived during the Information Age, the dawn of the Conceptual Age in response to a changing global landscape with increasing automation and information accessibility is instead driven by creators and empathizers (Pink, 2006). There is a need to prepare children in ways that will support them in keeping up with the changing demands of their world and workforce.

Many frameworks have been proposed to outline skills whose cultivation are believed to help today's children succeed (e.g., the 6 Cs: Golinkoff & Hirsh-Pasek, 2016; the Skills for 2030: OECD, 2019; the Framework for 21st Century Learning: Partnership for 21st Century Learning, 2019; the 8 core competencies: Robinson, 2015; the Seven Survival Skills for the twenty-first century: Wagner, 2010). While this highlights widespread agreement on the importance of developing such capacities, a multitude of reviews illustrate that the plethora of frameworks are referred to under many different names (e.g., Future Skills, 21st Century Skills, 21st Century Competencies, Soft Skills, Critical Skills) and without a clear definition or distinct set of capacities (Chalkiadaki, 2018; Chen, 2021; Joynes et al., 2019; Kotsiou et al., 2022; Scott, 2015; Voogt & Roblin, 2012). Moreover, a current review identified 99 frameworks comprising a total of 341 different Future Skills, sorted into nine meta-categories (Kotsiou et al., 2022). Interestingly, this comprehensive synthesis resulted in more meta-categories than individual constructs chosen to be included in many frameworks.

The diverse frameworks, broad terminology, and expanding potential set of constructs reflects a detrimental lack of consensus. Without a shared language, terms are left open to interpretation (Chalkiadaki, 2018), which may lead to breakdowns during implementation (Voogt & Roblin, 2012). Therefore, educators would benefit from an understanding of *what* these are, *why* they matter, and *how* to support them. As a result, rather than perpetuate an existing framework or introduce another exclusionary subset of constructs, this paper proposes terminology to frame discussions, examine individual constructs, and remain responsive to a changing world and an individual's needs within it. Such language has potential to begin structuring a more cohesive field and defining its boundaries.

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Lifelong competencies

Within the context of this paper, the term Lifelong Competencies refers to malleable, domain-general skills, attitudes, abilities, and understandings that support individuals in being resilient and adaptable in the face of changing and unpredictable circumstances of their own future. This definition excludes *ways* of knowing, such as learning processes and actions (e.g., play, discovery, exploration). It also excludes content knowledge, which tends to be domain-specific and concrete, where mastery can be attained and assessed for correctness and accuracy. The term lifelong has been chosen to indicate that these competencies are flexible, broad, and enduring, such that they continue to be relevant and useful throughout one's lifespan, support lifelong learning, and can be continuously developed across one's lifetime with unlimited growth. Domain-general in this definition does not indicate equivalence across domains, but rather potential usefulness for many subjects and disparate areas of life, while acknowledging domain-specific and contextual sensitivities (e.g., application, performance, interpretation) of each competency. Though often used synonymously, competency has been chosen rather than skill, as it is a broader term and refers to the fact that these are not only *what* someone can do, but also *how* they integrate and apply what they can do; not interchangeable, skill, which instead falls under the umbrella of competency, has been retained as part of the definition of the more complete terminology. Lifelong Competencies have an element of the self in that they cannot merely be taught to an individual for rote performance, but instead benefit from being internally practiced and metacognitively understood. They are easy to recognize but difficult to measure. The last part of the definition describes a divergence from terminology that limits these competencies to a pre-defined time period of the world's future (i.e., the 21st Century), which undermines and discounts that they have always been, and always will be, important for one's own future.

These competencies can, and should, be cultivated from a young age (Scott, 2015) and supported across domains and spaces, including informal environments (Voogt & Roblin, 2012). Led by intrinsic motivation and playing an active role in their own learning, museum visitors are welcome to pursue their own interests at their own pace. Moreover, free from predetermined curricula, limited time, didactic teaching approaches, and standardized testing, the children's museum reflects children, their personal context and interests, and their learning styles. Children's museums offer the conditions that make them the *holistic environment* uniquely poised to meet the demands, and overcome the challenges, of educating for Lifelong Competencies. However, as understudied concepts in the children's museum, which one(s) they prioritize is largely unknown, and, thus, so is their optimization.

Mission statements

Internal communication

Stating an organization's "reason of being," mission statements convey goals and purposes, guide strategic decision-making (e.g., spending limited resources, directing employee actions), and contribute to organizational culture (e.g., internal commitment, staff motivation) (Alegre et al., 2018; Campagna & Fernández, 2007; Cochran et al., 2008; McDonald, 2007; Morphew & Hartley, 2006; Stone, 1996). In museums, "the mission statement is always your starting point; everything in the plan will expand on the mission and explain how you will fulfill it" (Merritt, 2007, p. 60). In fact, it is the purpose(s) of informal learning experiences that determine the physical space, including the tools and materials within it, the supporting role(s) of others (Wardrip & Brahms, 2020), and guide educational programming (Patrick et al., 2007).

Furthermore, mission statements help children's museums "assur[e] the [learning] framework's relevance and implementation" (Foutz & Emmons, 2017, p. 183).

Children's museums are nonprofit institutions, which determine success by how effectively they realize the social purposes they aim to accomplish, as set forth in their missions (McDonald, 2007; Moore, 2000; Stone, 1996). Thus, beyond supporting practice and design, the "mission statement is the primary benchmark against which to evaluate the museum's performance" (American Alliance of Museums, n.d.-b, para. 1). As such, mission statements could help inform relevant research agendas, both within institutions and across the field.

Mission statements set an organization apart from those that are similar (American Alliance of Museums, n.d.-b; Stone, 1996), but content and practice may be misaligned (Bartkus et al., 2004). For example, although the majority of managers know the gist of their mission statement, less than half believe that they represent their organization's reality (Wright, 2002). This conflict might extend to museums: Zoos that include conservation in their mission statements do not always engage with these efforts, whereas those that do not include conservation still may (Maynard et al., 2020). Despite this, museum accreditation reviews are guided by not only meeting standards, but also *achieving institutional mission* (American Alliance of Museums, n.d.-a). The significance of mission statements to children's museum practice has been demonstrated by the Children's Museum of Indianapolis, who adapted theirs to include "children and families" to reflect family- rather than child-focused beliefs and practices (Foutz & Emmons, 2017). It follows that, before designing or evaluating children's museums, it is important to understand mission statement content.

External communication

Whereas some institutional documents (e.g., strategic plans, learning frameworks) are for internal use, mission statements also serve as external communication (Alegre et al., 2018; Bartkus et al., 2004; Morphew & Hartley, 2006). For the museum, external stakeholders include visitors. Due to their relative novelty, there is a general unfamiliarity of children's museums (Lewin, 1989) and many adults may not know what children's museums are for or how to best engage with them (Mayfield, 2005). If families do not know "what" children's museums offer, then they might be less likely, or even unable, to engage optimally. As Kirk and Nolan (2010) suggest, "perhaps mission statements are more critical in organizations with unclear purposes" (p. 486). In fact, when oriented to the learning potential of children's museum exhibits, parents *are* more able to recognize it (Song et al., 2017).

Before visiting, more than 80% of visitors are likely or very likely to visit a museum's webpage (Marty, 2007). Prominently displayed on many children's museum webpages, mission statements serve as a succinct message, which may contribute toward visit framing. Families tend to commit to pre-visit motivations (Csikszentmihalyi & Hermanson, 1995) and fulfill pre-visit agendas (Briseño-Garzón et al., 2007), such that the mission statement might support the benefits that come from an alignment of individual and organizational objectives (Bartkus et al., 2004). Unfortunately, a random sample of *Fortune 500* companies found that mission statements are often at the reading level of the college educated (Sattari et al., 2011). If this were true of children's museums, they might be inadvertently privileging the well-educated rather than signposting the visit for all.

American children's museums

This work focuses on Lifelong Competencies in the mission statements of children's museums in the United States of America (henceforth, American children's museums). This choice has

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been made because previous evidence suggests that mission statement content differs between types of institutions (Morphew & Hartley, 2006) and global regions (Bartkus et al., 2004). Furthermore, Lifelong Competencies may be viewed differently between countries (e.g., creativity: Runco & Johnson, 2002). Finally, adults in different countries have differing beliefs about children's museums' benefits (e.g., Wang et al., 2019). For these reasons, spanning across the core constructs of this study (i.e., mission statements, Lifelong Competencies, children's museums), this paper's tighter focus is considered a necessary initial step to reduce the risk of compounding limitations while ensuring a thorough review before examining, and potentially contrasting with, different types of institutions, places, and constructs.

THE CURRENT STUDY

As "museums are expected to have a formally stated and approved mission that articulates what the museum does, for whom, and why" (American Alliance of Museums, n.d.-b, para. 1), they serve as a comprehensive foundation from which to begin investigating and optimizing Lifelong Competencies in children's museums.

This research draws upon the mission statements of American children's museums to examine what they prioritize, through content frequency analysis, and how accessible this information is, through readability (Study A). This study goes further than an identified children's museum mission statement review (Mayfield, 2005) by including all available mission statements and exploring beyond term frequency. Thematic analysis investigates how the most prioritized Lifelong Competencies are discussed as goals and mediators (Study B). Thematic analysis is used because mission statements may share underlying concepts but use different terminology, or vice versa (Cady et al., 2011; Morphew & Hartley, 2006).

Working definition

"Term" is used to denote a meaningfully content-rich word (e.g., an affect, behavior, competency, population, process, value) while excluding common English function words (e.g., "a," "and," "is," "of," "that," "the").

STUDY A

Research questions

1. What terms are most frequently used in children's museum names?
2. How readable are children's museum mission statements?
3. What do children's museum mission statements tell us about their purpose(s)?
   3a. What terms are most frequent in children's museum mission statements?
   3b. Which Lifelong Competencies do children's museums prioritize?

Methods

Data collection

Data was collected in February 2022. The Association of Children's Museums' "Find a Children's Museum" website (Association of Children's Museums, n.d.) was used to form this

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study's sample. This website was accessed and "find locations" clicked with each US state and DC selected individually—there was at least one children's museum in each state and DC. All listings were recorded with their location and, where provided, webpage. This resulted in 361 entries; however, one (Children's Museum of Tacoma and Children's Museum at JBLM, programs of Greentrike) was separated into two entries. This matched all other museum systems, for which independent locations were listed separately, and allowed independent inclusion for museum name analysis. Four children's museums that were discovered to be permanently closed were removed. This process resulted in a total of 358 children's museums.

Each children's museum's website was visited, and the mission statement recorded. Where a website had not been listed on the Association of Children's Museums' website, online searching was used. For 12 children's museums, no website could be found. For 291, a mission statement was explicitly identified as such on the website. For 30, the statement was not explicitly labeled but was inferred, as it resembled the format of other mission statements in website presence and wording. Where multiple locations existed for the same museum system (four cases: two cases with two locations and one case of each three and four locations), the mission statement was recorded once. For 18, no mission statement was found, including five that belong to larger museum systems but did not have a separate children's museum mission statement. In all, 321 mission statements were recorded for analysis.

To avoid bias from terms included in children's museum names and the term "mission" during analysis, mission statements that included these components were edited to exclude them. For example, "The mission of Children's Museum of Pittsburgh is to provide innovative and inclusive museum experiences that inspire kindness, joy, creativity and curiosity for all learners." (Children's Museum of Pittsburgh, n.d., para. 1) was edited to "is to provide innovative and inclusive museum experiences that inspire kindness, joy, creativity and curiosity for all learners".

Museum name word frequencies

A word frequency query was run in NVivo (Version 12; QSR International Pty Ltd, 2018) with all the children's museum names. "Include stemmed words" was selected for the "Finding Matches" field and the standard NVivo English stop words enabled for exclusion. Minor adjustments to the resulting automatic query were needed to account for variations of automatic stemmed word groupings. Subsequent individual queries were run using the "Text Search" function and "Exact match only" selected for the "Finding matches" field. For example, further analyses expanded "discovery" to also include "discover," explored the usage of the term "kids" as a synonym for "children," and queried the frequency of the exact phrase "children's museum." Using text search results and matrix coding, results were obtained for unique cases where a term appeared in at least 10% of the sample, or 36 cases.

Mission statement

Readability

Microsoft Word (version 16.53; Microsoft, 2021) was used to determine each mission statement's length, Flesch Reading Ease, and Flesch–Kincaid Grade Level Score, measures that have been previously used to assess mission statement readability and clarity (e.g., Kirk & Nolan, 2010; Sattari et al., 2011). Analyses were carried out in RStudio (Version 2022.2.1.461; RStudio Team, 2022).

Term frequencies

A word frequency query was run in NVivo with all edited mission statements. "Include stemmed words" was selected for the "Finding Matches" field and the standard NVivo English

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stop words enabled for exclusion. As above, minor adjustments were made and the "Text Search" function used for "Exact match only" searches. For example, while "creative" and "creativity" were automatically grouped together, "curious" and "curiosity" were not, despite deriving from the same root word. Other times, too many words were included; for example, "experiments" was removed from an automatic grouping with "experience". To match search terms used for children's museum names, variations of "kid" were included in the query with "children". Final exact searches can be found in Table 1. The unique cases were calculated for each of these searches via matrix coding and recorded where a term appeared in at least 20% of the sample, or 64 cases. Each of these terms was determined as to whether or not it was a Lifelong Competency, as defined in this paper.

Results

Museum name term frequencies

Three terms appear in at least 10% of all 358 children's museum names: museum (276), children (245), and discovery OR discover (52). Including "kids" and alterations of the term (e.g., kid-space), the primary target population was indicated in 257 cases.

There were 222 "children's museum" that title themselves as such. An additional 17 names included both a variation of "children" or "kid" and "museum" but not the exact phrase "children's museum" (e.g., children's hands-on museum, museum for children, kids' museum).

Mission statement

Readability

Mission statements had a mean Flesch Reading Ease of 30.27 ($SD = 20.61$) and a median of 29.50. A Shapiro–Wilk normality test was statistically significant ($W = 0.965$, $p < 0.001$), with the distribution's kurtosis = 2.96 and skewness = 0.55.

TABLE 1 Most frequently occurring terms in American children's museum mission statements.

Term(s)	Total occurrences	Unique cases
Children OR children's OR child OR child's OR kid OR kids OR kid's	231	192
Learn OR learning	201	188
Play OR playful	166	157
Inspire OR inspires OR inspired OR inspiring OR inspiration OR inspirational	108	108
Family OR families	88	85
Creativity OR creative	83	83
Experience OR experiences OR experiential	81	80
Explore OR explores OR exploring OR exploratory OR exploration OR explorations	78	76
Discover OR discovery OR discovering	75	75
Community OR communities OR communities'	73	68
Lifelong OR life-long OR lifetime OR life OR lives	70	68
Curiosity OR curious	64	64

Mission statements had a mean Flesch–Kincaid Grade Level of 14.09 ($SD = 4.37$) and a median of 13.90. A Shapiro–Wilk normality test was not statistically significant ($W = 0.997$, $p = 0.714$), indicating a normal distribution, with kurtosis = 3.20 and skewness = −0.02.

Mission statements had a mean length of 23.75 words ($SD = 14.92$) and a median of 20.00 words. A Shapiro–Wilk normality test was statistically significant ($W = 0.848$, $p < 0.001$), with the distribution's kurtosis = 8.64 and skewness = 1.92.

Word frequencies

Two terms appeared in the majority of the mission statements: children and learn. This was closely followed by play. Nine more terms appeared in 64 or more cases: inspire, family, creativity, experience, explore, community, lifelong, and curiosity (see Table 1). Three of these terms inform "who": child, family, community; four provide "what": learning, creativity, curiosity, and discovery; four explain "how": through play, experiences, exploration, and inspiration; and one term contextualizes benefits as lifelong. Two terms qualified as Lifelong Competencies: creativity and curiosity.

STUDY B

While creativity is more prevalent in existing frameworks than curiosity, reviews show that each are uniquely included (e.g., Chalkiadaki, 2018; Chen, 2021; Kotsiou et al., 2022). More importantly, both terms meet the present definition of Lifelong Competencies.

Creativity at the children's museum

Often thought to be limited to artistic endeavors, creativity encompasses all fields and aspects of life (e.g., Robinson, 2015; Sawyer, 2012; Vygotsky, 2004). It is related to many positive outcomes, from academic achievement (Fasko, 2001) to well-being (Conner et al., 2018; Fanchini et al., 2019). In fact, a review of 18 studies suggests that creative learning environments support academic achievement; confidence and resilience; motivation and engagement; and social, emotional, and thinking skills (Jindal-Snape et al., 2013). With such widespread benefits, it is important to provide children with opportunities for their creativity.

Efforts to help develop creativity should begin in childhood (Kim, 2011; Vygotsky, 2004). Creativity is supported by a plethora of new and diverse experiences, materials, opportunities, and people, and the freedom to explore them (Amabile, 1989; Golinkoff & Hirsh-Pasek, 2016). The children's museum is a free-choice environment that caregivers are motivated to visit because they are creative places (McInnes & Elpidoforou, 2018) and offer materials and settings that they cannot at home (Weiland, 2015). Additionally, evidence suggests that creativity is more often displayed outside of school than in school (Runco et al., 2017), and systematic review has pointed to the benefit of out-of-school environments, including museums, on creativity (Davies et al., 2012). The children's museum provides an appropriate place for engaging and supporting creativity. Thus, it is important to understand how children's museums might do so.

Curiosity at the children's museum

Curiosity is an emotion-elicited, action-oriented (e.g., motivating exploration) mindset toward acquiring new or deeper information and/or understanding. It is associated with many positive outcomes, including well-being (Lydon-Staley et al., 2020) and academic

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achievement (Shah et al., 2018). Curiosity supports both the drive to learn and the learning process itself (Engel, 2011; Hassinger-Das & Hirsh-Pasek, 2018; Ramey-Gassert et al., 1994) and serves as a key factor in critical thinking (Wagner, 2010). Furthermore, children are curious *about* and exercise their curiosity *because of* others (Engel, 2011; Henderson & Atencio, 2007; Sternberg, 2019). A componential construct, curiosity involves individual, social, and physical environment factors (Hassinger-Das & Hirsh-Pasek, 2018; Shah et al., 2018).

Museums both depend on *and* contribute to curiosity: It is a reason visitors come to museums, a process through which visitors learn at museums, *and* an outcome of museum visits (Koran & Koran, 1986; Ramey-Gassert et al., 1994). However, it is not enough to merely design for curiosity—"it must be encouraged, facilitated, and guided" (Engel, 2011, p. 642). In fact, parent–child interactions during museum visits help transform children's curiosity into learning (Andre et al., 2017). While museum visits can stimulate and elicit child curiosity (Gaudreau et al., 2021; Gottfried et al., 2016), it is valuable to explore how to help visitors reap its full and wide-ranging benefits.

Research questions

4. How are creativity and curiosity used in children's museum mission statements?
   4a. What do children's museum mission statements say about planning for creativity and curiosity?
   4b. What do children's museum mission statements say about valuing creativity and curiosity?

Methods

The same dataset as Study A was used for deeper investigation to better understand "how" and "why" the identified Lifelong Competencies of creativity and curiosity are planned for and valued. Using the "Text Search" function and "Exact match only" selected for the "Finding matches" field, searches were conducted with all 321 mission statements using creativ* (hereafter: creativity) and curio* (hereafter: curiosity). A total of 119 unique mission statements with one or both of these terms were identified for thematic coding.

Each resulting mission statement was coded for whether or not creativity and/or curiosity were considered natural traits the child brings to the museum.

All 119 mission statements were coded for how creativity and/or curiosity were used in the mission statement: as a goal, a mediator toward another goal, or other. For all mission statements where creativity and/or curiosity were the goal, the verb root describing it as such was identified. Some mission statements included how they promoted creativity and/or curiosity. This information and qualifying descriptors were recorded and thematically coded. For cases where creativity and/or curiosity were mediators for other outcomes, those outcomes were recorded and thematically coded. In all analyses, themes were created as they emerged—by allowing themes to emerge, the museums speak for themselves, helping to ensure pragmatic relevance of this work.

Results

Of the 119 mission statements that included creativity and/or curiosity, 55 included creativity only, 36 curiosity only, and the terms co-occurred in 28 cases.

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Natural

Creativity and/or curiosity were conveyed as natural to the child in 15 mission statements, 7 of which included curiosity only, 1 included creativity only, and 7 included both terms.

How is the competency used?

Of the 83 mission statements that included creativity, 44 stated it as a goal, 32 as a mediator, and 11 in another way. Of the 64 mission statements that included curiosity, 54 stated it as a goal, 6 as a mediator, and 8 in another way. This process resulted in more codes than unique cases, as 4 mission statements with each creativity and curiosity were counted as a goal *and* a mediator (e.g., "is to enhance the community by inspiring creativity, learning, and curiosity" (Mt Pleasant Discovery Museum, n.d., Our Mission section, para. 1), where inspiring creativity and curiosity was considered a goal of the children's museum *and* as the mediator for enhancing the community). Of the mission statements that had both, 3 were conflicting, as in one was used as an input for the other as a goal (e.g., "is to spark curiosity & inspire learning through exploration & creative play." (Shenandoah Valley Discovery Museum, n.d., para. 1)).

How: Fulfilling goals

Descriptive indicators. In the 44 mission statements where creativity was stated as a goal, a total of 48 verbs described it as such, of which there were 13 unique verb roots. The most frequent was inspire, followed by foster, nurture, and spark. For the 54 mission statements that stated curiosity as a goal, a total of 55 verbs indicated it as such, of which there were 15 verb roots. The most frequent was inspire, followed by spark, stimulate, and ignite (see Table 2).

Ways of achievement. Of the 44 mission statements where creativity was a goal, 32 included information about how they aim to achieve this. Of the 54 mission statements where curiosity was a goal, 40 of them included details about how. Some mission statements included more than one "how" element, and 48 creativity and 61 curiosity codes were made. Five themes emerged: the experience (e.g., experiences, programs, activities), the environment (e.g., environment, exhibits), play, a particular subject/domain (e.g., STEAM, history, art), and through community (see Table 3).

Qualifiers. Most frequent qualifiers for supporting both creativity and curiosity were that an experience was interactive/hands-on, that it was a learning/educational experience, and that it brought about a particular affect (e.g., joy, fun, positive). Creativity was also mentioned with a high number of experiences described as innovative/inventive. The most common qualifiers for the environment were that it was interactive/hands-on and that it involved a particular affect (e.g., fun, awe-inspiring) (see Table 3). No differences in the most frequently occurring qualifiers were found for the environment between creativity and curiosity. Though frequently identified as a process to achieve creativity and curiosity goals, play was not often qualified.

Why: Mediator as values

Of the 32 mission statements that included creativity as a mediator, 48 intended outcomes were identified. For the six mission statements where curiosity was a mediator, seven outcomes were identified. Six themes emerged: learning (e.g., learn, acquire knowledge, lifelong learning), action (e.g., play, discover), mindset/affect (e.g., imagination, delight,

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TABLE 2 Frequency of verbs indicating creativity and curiosity as goals in American children's museum mission statements.

Verb root	Creativ*	Curio*
Awaken	0	2
Develop	1	0
Encourage	4	1
Engage	1	2
Enhance	1	0
Equip	3	0
Exercise	0	2
Flourish	1	1
Foster	6	3
Grow	0	1
Ignite	2	6
Inspire	13	14
Nourish	1	1
Nurture	6	1
Pique	0	1
Spark	5	12
Stimulate	4	7
Support	0	1
Total	48	55

wonder), connection (e.g., connect people together/to world, enhance/engage community), an impact on children (e.g., engage, empower), and long-term social impact (e.g., fuel the future) (see Table 4).

As other

For the instances that creativity and curiosity were neither a goal nor a mediator, they were used to characterize the museum and the visit experience (creativity: 8; curiosity: 6) and to characterize the visitor (creativity: 3; curiosity: 2).

DISCUSSION

Children's museum names

Frequency results reveal that less than two thirds of American children's museums, as indicated by inclusion in the Association of Children's Museums listings, explicitly title themselves as such. Consequently, children's museums may not be easily identifiable. This could compound uncertainty among adults who are already unfamiliar with this unique type of institution and in need of support in understanding children's museums (Lewin, 1989; Mayfield, 2005). Furthermore, that "discovery" appears frequently in children's museum names indicates its importance in describing children's museums. This is one way of signaling to the public the intention for interactive learning, a defining characteristic of children's museums (Luke & Windleharth, 2013; Mayfield, 2005), in contrast to the historied connotation of museums as object-based collections on display.

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TABLE 3 How creativity and curiosity goals are planned for, according to American children's museum mission statements.

Theme	Count	Qualifier themes
Creativ*		
Community	1	1 mission statement specified 2 total qualifiers: diverse (1), joyful (1)
Environment	13	10 specified 15 total: interactive/hands-on/participatory (5), affect: fun (3), family-friendly (2), safe (2), enriched (1), inviting (1), playful learning (1)
Experience	20	18 specified 29 total: hands-on/interactive/participatory/play-based (9), learning/educational (6), innovative/inventive (5), affect: joyful/fun/positive (3), family-centered/inclusive (2), dynamic (1), engaging (1), safe (1), transformative (1)
Play	11	1 specified 1 total: open-ended (1)
Subject/domain	3	
Curio*		
Community	2	2 specified 3 total: diverse (1), interactive (1), joyful (1)
Environment	13	9 specified 12 total: hands-on/interactive (6), affect: awe-inspiring/fun (2), dynamic (1), STEAM (1), playful learning (1), learning (1)
Experience	26	17 specified 31 total: hands-on/interactive/play-based (10), educational/learning (9), affect: joyful/fun/positive (4), creative (1), cultural (1), dynamic (1), engaging (1), inclusive (1), innovative (1), science (1), transformative (1)
Play	16	5 specified 5 total: active (1), creative (1), dramatic (1), interactive (1), open-ended (1)
Subject/domain	4	3 specified 3 total: engaging (1), hands-on (2)

TABLE 4 Creativity and curiosity valued as mediators toward other goals, according to American children's museum mission statements.

Mediator toward	Creativ*	Curio*
Learning	22	2
Action	8	1
Affect/mindset	7	1
Connection	6	2
Impact on children	5	0
Long-term social impact	0	1

Mission statement

Readability

Overall, findings indicate that children's museum mission statements are compact, difficult to read, and hard to understand. Such characteristics could sacrifice external communication for visitor support and exacerbate issues surrounding museum inclusion. Mission statements should be tailored for their audiences (Stemler & Bebell, 2013; Stone, 1996). Having a more accessible mission statement might help parents and caregivers better understand children's museum intentions and make sense of their visit. This is valuable because family visits are directed by parents' motivations, agendas, and expectations (Briseño-Garzón et al., 2007;

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Falk et al., 1998). Furthermore, as Tools of the Mind play plans help children sustain purposeful play (Bronson & Merryman, 2009), a child-aimed mission statement may help children engage with the children's museum in a more intentional way, which could result in greater outcomes.

Content

The most frequent terms in children's museum mission statements provide insight into their prioritized purposes. It is no surprise that, as an informal educational environment for children, "children" and "learn" appear in more than half of the mission statements. Furthermore, the frequency of "play," "exploration," and "discovery" indicates that it is something the child *does* as an active agent within the children's museum space that matters. Beyond this, the findings of "inspire" and "experience" indicate that there is more to the children's museum visit than merely going through a process of *doing*, but that it involves a holistic approach, inclusive of affect and mindset. The prevalence of "family" and "community" specifies that social interactivity is valued, and the experience extends beyond the child. The frequency of "lifelong" indicates that museums are invested in Lifelong Competencies. That there were two Lifelong Competencies with "creativity" and "curiosity" illustrates these concepts' significance in American children's museums' purpose. The greater prevalence of creativity over curiosity reflects reviews of frameworks in which, though both are listed, creativity is more often included than curiosity (e.g., Kotsiou et al., 2022).

Creativity and curiosity

Study A provided insight into "who" and "what" is prioritized by American children's museums. Study B provided clarification into "how" children's museums plan to achieve the identified Lifelong Competencies of creativity and curiosity and "why" they might value these competencies. While some definitions and frameworks consider curiosity to be a component of creativity (e.g., Prentice, 2000), others acknowledge curiosity as an essential competency itself (e.g., Robinson, 2015; Wagner, 2010). That nearly a quarter of the 119 children's museum mission statements that mentioned at least one of these terms had included both suggests that they are considered as separate competencies and should, therefore, be further examined independently. However, that only three cases used them in a conflicting manner shows they are likely considered complementary in design and practice.

Findings suggest that curiosity is more often considered natural to the child than is creativity. Moreover, the terms used to describe creativity and curiosity as a goal differ in a similar manner. While "inspire" appears most before both terms, they differ in the two next most frequent terms, with creativity being preceded by "foster" and "nurture" and curiosity by "spark" and "stimulate." Taken together, these findings indicate that children's museums might consider creativity to be malleable such that their role is to *support* its development, while viewing curiosity as something that only needs to be *triggered* during the visit. It is, then, interesting that curiosity is not stated as a mediator more often.

It is promising that nearly three quarters of the mission statements gave information about "how" creativity and curiosity are to be achieved, indicating that children's museums are planning for these goals. Results suggest that children's museums primarily intend to achieve creativity and curiosity through experiences, environments, and play. Where available, qualifying adjectives provide insight into the particular types of experiences and environments children's museums feel are most helpful in planning to achieve creativity and curiosity: those that are interactive, educational, family-friendly, with a positive affect, and innovative.

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Furthermore, the focus on play as a route toward creativity and curiosity illustrates that play is not itself an outcome of the children's museum visit, but rather a process through which children benefit from and learn during their visit, a view held by many children's museum practitioners (Luke et al., 2021).

Finally, conveying "why" children's museums value engaging creativity and curiosity, findings show that, as mediators, creativity and curiosity are often intended to help visitors achieve more and deeper learning gains. Children's museums clearly value educational benefits, and the explicit intention of Lifelong Competencies to achieve these educational benefits further positions children's museums as holistic environments. Understanding why something is valued, rather than only what is valued, increases the likelihood for people to engage with it. While parents more often enter the children's museum with entertainment motivations than educational agendas (McInnes & Elpidoforou, 2018), viewing the visit more holistically might help them reframe their visit to align it more with the children's museum's mission, and, thus, experience greater benefits.

Despite that children's museums differ from one another (Lewin, 1989) and mission statements can convey institutional uniqueness (American Alliance of Museums, n.d.-b; Stone, 1996), frequency and thematic coding illustrate that children's museums have many commonalities in how they value and discuss creativity and curiosity. As similarities better allow the appropriate sharing of museum learning frameworks (Foutz & Emmons, 2017), such findings suggest that creativity and curiosity can be discussed as general children's museum practices rather than site specifics, allowing research, assessment, and evaluation to benefit the field more wholly.

Limitations and future directions

Prior research shows that children's museum professionals place an importance on children's museums' ability to support social and emotional growth (Luke & Windleharth, 2013). The present findings do not reflect this. Moreover, evidence suggests that most children's museum professionals feel play to be "extremely important" to museum mission; however, prior research has found that "play" is only in about half of the mission statements (Luke et al., 2021), a finding replicated here. Future research with museum professionals is needed to explore discrepancies between what is explicitly stated in mission statements and implicit beliefs.

As "an effective mission statement must first meet the needs of its own community" (Stemler & Bebell, 2013, p. 173), the present analysis of American children's museums sacrifices generalizability to other cultures and eclipses learning in other types of museums. In addition, museum mission statements change over time and in response to community needs (Merritt, 2007). Future research could explore a more diverse sample of children's museums, examine other types of museums (e.g., science centers, natural history museums, zoos), and reassess mission statements over time, as well as compare findings to those presented here.

Instead of guiding practice, organizations may use mission statements more for public relations purposes (Campagna & Fernández, 2007; Wright, 2002). Moreover, other factors (e.g., organizational decisions, employees' affective commitment) may moderate the relationship between mission statement and performance (Desmidt et al., 2011; Patel et al., 2015). While mission statements serve as the basis for museum planning and an anchor for internal and external stakeholder expectations, the present findings might be restricted by the exclusion of internally elaborated strategic plans and learning frameworks. It would be valuable for future work to examine implemented museum practice and any (mis)alignment in relation to the present findings on intended practice.

Informing "who," "what," "how," and "why," American children's museum mission statements do meet formal expectations and indicate purpose and intended practice. Future research should investigate whether mission statements orient families and help plan their visit. Furthermore, this research should investigate whether mission statements that are easier to read and understand could enhance visit engagement and outcomes.

Finally, as mission statements can be assessed through evaluation, this research lends itself to inform future evaluation work in American children's museums and offers guidance on research agendas. Importantly, by representing children's museums' own voices, this work allows museums' goals to guide such future work, reducing potential gaps between academic research and practice-based usage.

CONCLUSION

As a place intended for children, families, and communities to engage, play, and learn together, children's museums offer an opportune setting to develop Lifelong Competencies that will help children live into their own successful and fulfilling futures. Providing a way to convey their purposes, mission statements indicate that children's museums prioritize creativity and curiosity and intend to achieve these goals through experiences, environments, and play with a primary focus on hands-on and interactive elements, family-friendly features, ways of eliciting a positive affect, and experiences that are educational and innovative. Furthermore, creativity and curiosity at the children's museum serve to primarily mediate learning, actions (i.e., learning processes), and affect (i.e., learning mindsets). However, mission statements are an embodiment of *intended* practice. Therefore, this work is only the foundation of museum research for supporting Lifelong Competencies at children's museums.

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CONFLICT OF INTEREST STATEMENT

None.

DATA AVAILABILITY STATEMENT

Research data are not shared.

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Chapter 6

Rethinking Creativity: A Growth-Oriented, Multi-Componential Perspective and a Proposal and Definition of "Child Creativity"

Introduction

Technological advancements are increasingly bringing content knowledge to our fingertips. As a result, success hinges less upon what we know and instead lies in what we can do with our knowledge. With the development of artificial intelligence (e.g., OpenAI's ChatGPT, Google's Gemini), there is more pressure than ever to be able to recognise connections nested within and arising from our knowledge, including the utility of what *could be,* rather than merely possessing the synthesis skills to identify and reinforce pre-existing patterns of what *is*.

Reviews of frameworks for Lifelong Competencies (referred to under a myriad of terms, e.g., Soft Skills, Future Skills, 21st Century Skills, 21st Century Competencies) consistently identify creativity as one of the most frequently mentioned (e.g., Chalkiadaki, 2018; Kotsiou et al., 2022; Voogt & Roblin, 2012). In fact, creativity is "considered one of the most valuable attributes a person can have" (Glăveanu, 2011, p. 129), with wide-ranging benefits from academic achievement to wellbeing (e.g., Conner et al., 2018; Fanchini et al., 2019; Gajda, Karwowski, & Beghetto, 2017). Moreover, as "an effective way to deal with crisis and to achieve flourishing experiences" (Tang et al., 2021, p. 11), creativity supports individuals in adapting to a constantly changing world (Cropley, 2001). Creative thinking has also been reported as one of the most important workforce skills, with rapidly increasing relevance (The World Economic Forum, 2023). Beyond substantial personal and professional value, creativity benefits the whole of humanity, powering societal advancements and cultural evolution (Csikszentmihalyi, 1996, 1999; OECD, 2022; Runco, 2004; Urban, 2003).

A Lifelong Competency (see section 'Lifelong Competencies' in Chapter Five, Kupiec, 2024) with a plethora of benefits, creativity is important across one's lifespan. Despite limited creativity research that utilises a longitudinal methodology (Long, 2014), there is a body of evidence indicating that creativity necessitates a growth-oriented approach. Although efforts to support and nurture creativity should begin in childhood (Kim, 2011; Vygotsky, 1967/2004), of the available evidence, compared to adult creativity, there is a paucity of creativity research that measures *children's* creativity. This is problematic because there is a need to recognise children's creativity in order to support it and to

develop the pedagogy to nurture it (Glăveanu, 2011; Runco, 2003). The creativity that children engage in might be relatively unnoticed and underappreciated because of conceptualisations that fail to adequately capture it, not because it does not exist or is less important than adult or eminent creativity.

While creativity is "an enabling device, which will help raise standards of achievement by allowing children to develop their potential" (Joubert, 2001, p. 33), without an appropriate framework and definition to understand children's creativity, the field is at risk of overlooking an important period to support a crucial Lifelong Competency. As such, a re-examination of the conceptualisations and frameworks we use and the ways in which we define and recognise creativity is needed.

This chapter will first argue why it is necessary to adopt a growth-oriented approach to creativity, underscoring the significance of childhood. Next, the complexity of "creativity" will be exemplified by reviewing its diverse conceptualisations across the field before a new conceptualisation, Creativity's Lifelong-Oriented Variables of Experience Representation (CLOVER), is introduced and its form and function explained. Through this discussion, it will be shown that creativity is an experience. Next, the various ways creativity is currently defined will be examined, as well as the uncertainties and subjectivities laced through them, particularly in reference to children's creativity. As a result, a sub-construct of creativity, *child creativity,* will be discussed and defined as *the integration of something that is not already in the present moment and context into the present moment and context*. Finally, children's museums will be presented as a promising context to holistically support *and* nurture children's creativity, especially during family visits.

Creativity is Growth-Oriented

Creativity changes across the lifespan, and "one simply cannot expect the same kinds and levels of creativity in a preschooler as in a later grade-schooler, or an adult, for that matter" (Tromp & Sternberg, 2022, p. 559). Thus, to effectively explore and understand creativity, a growth-oriented approach is necessary. In fact, creativity itself is supported by a *growth* mindset (Dweck, 2006). Growth as used here refers to both developmental *and* opportunity-linked differences and change. For example, evidence suggests a relationship between an individual's creativity and their semantic network structure (Denervaud et al., 2021; Kenett et al., 2014; Kenett & Faust, 2019), which both matures over time and develops through new exposures and life experiences.

A Developmental Competency

Evidence suggests that creativity emerges differently across the lifespan, supporting a developmental perspective. For instance, neuroimaging during creativity tests has identified different neural activation between adolescents and adults (Kleibeuker, Koolschijn, Jolles, De Dreu, & Crone, 2013; Kleibeuker, Koolschijn, Jolles, Schel, et al., 2013; Vartanian, 2022). Moreover, a wealth of evidence shows that creativity is related to a range of cognitive abilities known to mature with age, including working memory (Zhao et al., 2023; Segundo-Marcos et al., 2024), cognitive flexibility (Segundo-Marcos et al., 2024), abstract thinking (Kim, 2011), executive functioning (Benedek & Neubauer, 2013), spatial ability (Kell et al., 2013), and creative metacognition or meta-creativity, which is characterised by knowing about creative strategies, understanding when and where creativity is appropriate, and employing creativity-related self-monitoring during creative activity (Beghetto & Kaufman, 2014; van de Kamp et al., 2015; Kaufman & Beghetto, 2013; Mevarech & Paz-Baruch, 2022). The field of creativity would benefit from a greater utilisation of developmental methodologies to explore these relationships and better understand how creativity changes and, consequently, how it might be enhanced across the lifespan.

Additionally, an individual's creative activities and engagements change over the course of development. For example, because children's reasoning and imagination are more separate than adults' (Ayman-Nolley, 1992), children's creativity tends to be more concrete. Consequently, Vygotsky (1967/2004) suggested that creativity is marked by drawing in early childhood, where expression is more accessible, before being overtaken by verbal creativity. As a result of different communicative manifestations, consideration must be taken in how creativity is recognised across the lifespan.

Critical Developmental Period in Childhood

Mixed findings across the field have led to great interest in lifespan patterns of creativity and their potential drivers. Initially fuelling this interest, Torrance (1968) identified that children generally go through a temporary creativity slump in fourth grade. Though other research has not replicated the same finding (e.g., Charles & Runco, 2001; Kim, 2011), Torrance's finding took hold in the field and has served as an important indicator for creativity's development as a dynamic competency. For instance, Charles and Runco (2001) did not find a creativity slump at any grade level, but they did identify a significant increase

in both children's evaluative skills and their preference for appropriate responses with grade level. Additionally, Kim's (2011) analysis of Torrance Tests of Creative Thinking-Figural scores from six datasets, including test development and five re-norming samples for a total sample of 272,599, suggests sixth grade as a possible slump. More interestingly, this analysis identifies trend differences between creativity score components over the lifespan, and Kim proposed possible reasons for these. For example, findings suggest that children's fluency scores increase until the third grade, remain static for a couple of years, and then begin to decline at sixth grade, potentially because of greater self-monitoring and self-filtering of inaccurate and inappropriate ideas. Additionally, after a rise through the fifth grade, originality scores begin to decline at sixth grade, perhaps resulting from a greater tendency of conforming to others. On the other hand, abstract thinking scores never experience a decrease, reflecting that abstract thinking continues to mature across a lifetime.

While the evidence has been mixed, the body of work reflecting changes related to maturation (e.g., self-monitoring) and socialisation (e.g., internalising external expectations) holds important insights for enhancing creativity. It might be less that individuals lose their capacity for creativity, and more that they do not *express* their creativity as openly and freely. In fact, while teachers' ratings of elementary aged students' creativity do not decline across grade level, students' creative self-efficacy does (Beghetto et al., 2011). Evidence also suggests that increases in adults' assessed creativity are not always accompanied by increases in creative self-assessment, or ratings of how creative individuals think their own responses are (Anderson et al., 2025). Unsurprisingly, then, creative confidence varies more between individuals than their actual performance (Karwowski et al., 2019). Nonetheless, these are important findings because an individual's self-perceptions influence their choice of activities, effort, and persistence (Bandura, 1978a).

Not only do an individual's creative self-beliefs and whether they value creativity contribute to their creative engagement in a particular situation, but they also "over time can crystallize into one's creative identity" (Beghetto, 2022, p. 397). In fact, children with higher creative self-efficacy report more enjoyment of creative activities at a science centre than children with low creative self-efficacy, and engaging in creative activities can increase their creative self-efficacy (Atwood-Blaine et al., 2019). Thus, influenced by an individual's creative self-beliefs, either a downward disengagement or an upward engagement cycle can begin, such that opportunities for children to build positive creative self-efficacy as their

self-beliefs are forming would be highly advantageous for their future creative engagement and expression. Understanding *what* to support and *how* to support it can inform the design of opportunities that offer positive creative experiences, which could cascade into a self-enhancing creativity cycle.

These findings from across the field of creativity notably coincide with theories of psychological development, substantiating the need for a developmental perspective in which *children's* creativity is uniquely understood and supported. For instance, and reflecting the evidence suggesting that children may begin to self-censor their creativity, Kohlberg's (1975) stage approach to moral reasoning proposes that Stages 1 and 2 are driven by considerations of the self, but at Stage 3, individuals hold concern for social approval, including the desire to fit in and conform to social norms, which drives their expressions and actions. Additionally, the need for support across childhood as an individual's creative self-identity is internally constructed aligns with Erikson's (1993) stages of development and their positive resolutions, in which young children (i.e., children aged 3.5–6 years: Trawick-Smith, 2010) can develop their purpose, autonomy, and confidence (e.g., willingness to pursue and engage in creative activities); children (i.e., children aged 6–12 years: Trawick-Smith, 2010) can acquire a sense of competence and belief in their abilities (e.g., self-efficacy to express creativity); and adolescents can build a strong sense of self and self-image, values, and beliefs (e.g., that they are creative and that creativity and creative activities are valued).

As "people with the same skills may, therefore, perform poorly, adequately, or extraordinarily, depending on whether their self-beliefs of efficacy enhance or impair their motivation and problem-solving efforts" (Bandura, 1988, p. 279), creative self-beliefs that take root in childhood can have significant lasting influence on later creativity. In fact, adults who underestimate their creativity perform significantly worse on some measures of creativity (e.g., fluency) (Karwowski et al., 2019). Furthermore, adults' creativity-specific anxiety is related to their creative achievement, attitudes toward creativity, and how they incorporate creativity into their sense of self (Daker et al., 2020). Runco (2003) has suggested teaching children the extracognitive capacity of "ego strength" to stand up for their ideas, as well as the discretion to know when to exercise this ego strength. Demonstrating the impact of ego strength beyond a single idea, when faced with difficult

situations and life challenges “instead of being shaped by events, [notable creatives] shaped events to suit their purposes” (Csikszentmihalyi, 1996, p. 181).

Though evidence suggests that targeted programmes can build adults’ creative self-efficacy and expression, including in those who have previously been told that they are not creative (Plucker & Dow, 2010), it would be more effective and individually fulfilling to be proactive rather than rely on corrective remedies. Childhood may be the best time to enhance lifelong creativity by providing supportive creative experiences that, over time, nurture the development of positive creative self-beliefs.

Experience-Dependent and Opportunity-Linked

In addition to changing over the course of an individual’s lifespan, creativity depends on personal experiences and opportunities. In fact, twin studies have found that genetic factors *and* environmental influences contribute to creativity (e.g., Kandler et al., 2016). It follows, then, that the climate an individual grows up within influences their creativity. Evidence suggests that this influence can function through a range of factors, such as an individual’s school environment and its pedagogical approach (Besançon & Lubart, 2008; Denervaud et al., 2021; Segundo Marcos et al., 2020; Segundo-Marcos et al., 2024), whether they experience marginality (Gardner, 1993), the socio-political conditions and cultural diversity of their environment (e.g., civil disturbances, political instability, political fragmentation, proximity to large cultural centres, zeitgeist: Amabile, 1996; Simonton, 1978; Sternberg and Lubart, 1991a), and creative social prevalence (e.g., more creatives in the prior generation, more role models: Amabile, 1996). Moreover, despite some similarities, conceptualisations of creativity also vary by culture (Lim & Plucker, 2001; Runco & Johnson, 2002), suggesting differences in how it might be encouraged and recognised.

More personal than the surrounding climate an individual grows up within, creativity is influenced by the opportunities available to them, such as what can be afforded by family capital and, more broadly, societal resources (Csikszentmihalyi, 1999). Creativity also depends on experiences that uniquely happen to an individual; for example, having experiences that are considered unusual (e.g., living abroad) or unexpected (e.g., parental loss) has been associated with creativity across the literature (Ritter et al., 2012). Additionally, proximal others’ roles and behaviours influence creativity. For example, parenting style, beliefs, and behaviours are related to children’s creative self-beliefs and creativity (Amabile, 1989, 1996; Gralewski & Jankowska, 2020; Karwowski et al., 2022; Liang

et al., 2022; Mehrinejad et al., 2015). Moreover, having a significant supporter (e.g., a confidant, a mentor) who provides *affective support* through care, encouragement, and belief and *cognitive support* through training, opening opportunities, and by offering challenge and additional work is associated with field-wide creative contributions (Csikszentmihalyi, 1996, 1999; Gardner, 1993).

Creativity further benefits from a *variety* of experiences. Given that "original thought does not exist in a vacuum" (Csikszentmihalyi, 1999, p. 315) and "no one could ever create a representation that would have absolutely no relation to reality whatsoever" (Vygotsky, 1926/1997, p. 149), it follows that "no creative person can get along without previous experiences or facts" (Guilford, 1950, p. 448). In fact, through dissociation and association, prior experiences provide components that are neither new nor unreal; however, creativity emerges in their recombination (Vygotsky, 1967/2004). Case studies examining eminent creatives recognise childhood as an important period during which new interests and curiosities are sparked, and a reservoir of experiences to draw upon is developed (Csikszentmihalyi, 1996; Gardner, 1993; Simonton, 1997). Illustrating this, while lab-based measures on associative thinking focus on *remote* associations (e.g., Mednick, 1962), in-depth examinations of eminent creative products reveal that real-life creativity instead emerges from *near* associations, suggesting that new ideas begin with old ideas (Weisberg, 2023). Thus, diverse inputs may prime minds to think in unexpected ways (Simonton, 2004)—adults who engage in a wider variety of creative activities in their day-to-day life perform higher on divergent thinking tasks (Koutstaal et al., 2025). Unsurprisingly, then, openness to experience is often found to be associated with increased engagement in everyday creative behaviour *and* higher performance on creativity assessments (Jauk et al., 2014; Jung & Hunter, 2023; Orwig et al., 2023; Silvia et al., 2014; Zabelina & Robinson, 2010).

Finally, engagement in and practice of creativity increases it (e.g., Runco, 2003; Vygotsky, 1967/2004). Evidence suggests that adults who engage in more everyday creative activities exhibit greater creative achievement (Jauk et al., 2014; Jung & Hunter, 2023). Beyond benefiting from mere engagement, the components that contribute to creative ability can be *intentionally* practiced (Duckworth, 2016). In fact, meta-analyses indicate that creativity training programmes, which typically target creativity-related cognitive skills, have a significant positive effect on creativity across ages (Ma, 2006; Rose & Lin, 1984; Ruiz-del-

Pino et al., 2022; Scott et al., 2004a; Scott et al., 2004b). However, above and beyond *participating* in creative activities, it also matters how they are affectively perceived, as "the more positively people experience creative activities, the more creativity becomes a part of their personalities" (Moran & John-Steiner, 2003, p. 78). It is clear that creativity depends on an individual's experiences and opportunities, and that it is not only important to provide a range of creativity-enhancing opportunities, but that these also harness an individual's past experiences and support their positive engagement.

Expertise

Lastly, creativity differs with the degree of accumulated experience, or level of expertise, an individual has with a particular activity or domain. Sternberg et al. (2002) proposed that different *types* of creative contributions can be made to a field, which are determined by how and in which direction a contribution propels the field forward, including how existing paradigms are preserved or rejected. A substantial body of evidence examining creative behaviour in occupational achievement suggests that minor contributions (e.g., extending existing facts or principles in important but narrow ways) are likely to come from individuals in middle age; however, major contributions (e.g., redefinition and/or reorganisation that has wider applicability) peak in young adulthood (Mumford & Gustafson, 1988). This difference has been attributed to a novice-expert continuum, whereby *enough* information and knowledge are needed to understand a field in order to be able to contribute meaningfully to it, but *too much* knowledge and experience can be counterproductive to creativity due to domain knowledge fixation and an overreliance on, and inflexibility to shift away from, well-established heuristics, strategies, models, and algorithms (Amabile, 1996; Boden, 2001; Csikszentmihalyi, 1996, 1999; Runco & Chand, 1995; Mumford & Gustafson, 1988; Wiley, 1998).

Not only does expertise determine an individual's type of creative contribution (i.e., generative output), but it also impacts their process of creative engagement. In their work on creativity, Rosen et al. (2017) have differentiated between Type 1 cognitive processes, which are automatic and associative, and Type 2 cognitive processes, which are executive and controlled. Their findings show that less-experienced jazz pianists' improvised music was judged significantly more creative when they were given explicit instructions to improvise creatively, which were used as a way to engage Type 2 processes, compared to when they were given simple instructions to improvise; however, a significant difference

was not found for experienced jazz pianists, who might have instead been hindered by the explicit instructions. As such, it is essential to recognise that supportive environmental conditions can vary with expertise—the same conditions could be supportive to some individuals but a hindrance to others (e.g., Mumford & Gustafson, 1988). To best enhance creativity, it is necessary to understand where an individual lies along their own personal growth continuum.

Conceptualising Creativity: Individually Sensitive and Circumstantially Conditional

In addition to being growth-oriented, changing over a larger swath of an individual's life, creativity is also dependent on and sensitive to an individual's engagement with their immediate circumstances and conditions.

Existing Conceptualisations of the Field

Theoretical Frameworks

The field of creativity research was ignited by Guilford's (1950) presidential address to the American Psychological Association, in which he outlined his thinking on the construct of creativity and hypothesised a pathway for its scientific investigation. In doing so, he suggested that creativity is influenced by factors of an individual's abilities, motivation, and temperament. More than ability, he also asserted that the same environment and conditions would give rise to "great differences in creative productivity among individuals" (Guilford, 1950, p. 445) *and* that the same individual would be differentially creative "from time to time" and depending on the area of activity. This address spurred an abundance of interest and research in the field of creativity, but the term "creativity" remained loosely defined and broadly applied (Rhodes, 1961). In response to a quickly growing but disparate field, Rhodes (1961) reviewed many definitions of creativity; rather than settling on a definition, he proposed that there are four distinct "strands" of creativity (the four P's): person (i.e., "personality, intellect, temperament, physique, traits, habits, attitudes, self-concept, value systems, defense mechanisms, and behavior" (p. 307)), process (specifically referring to *mental processes*; i.e., "motivation, perception, learning, thinking, and communicating" (p. 308)), press (i.e., "the relationship between human beings and their environment" (p. 308)), and product (i.e., "when an idea becomes embodied into tangible form" (p. 309)).

Though Rhodes (1961) was explicit in his writing that "each strand has unique identity academically, *but only in unity do the four strands operate functionally*" (p. 307,

emphasis added), Glăveanu (2013) argued that this conceptualisation has instead served to divide the study of creativity, as research could be, and was, isolated by selectively examining one strand without the others. In response, he adapted the four P's of creativity with new terminology to better reflect a sociocultural perspective of creativity as a contextualised, situated, and interrelated system, putting forth the five A's model: actor, action, artifact, audiences, and affordances (Glăveanu, 2013). With this new language, an actor is a person in relation to their societal context, their action goes beyond cognitive processes to incorporate internal psychological *and* external behavioural acts, a product is situated within a cultural context as an artifact, and the environmental element of "press" is divided into social (i.e., audiences) *and* material (i.e., affordances) contexts. Moreover, Glăveanu (2013) visually illustrated the interrelations of the five A's to emphasise that creativity unfolds in their relation; for example, action arises from actor-audience interactions, and environmental affordances can both shape and be shaped by actions.

Lubart (2017) argued that the four P's and the five A's only partially capture the breadth of work conducted in the field of creativity, and that a framework extended to seven themes, or the 7 C's of creativity, would be more accurately comprehensive: creators, creating, collaborations, contexts, creations, consumption, and curricula. Aside from offering new terms for the four P's and five A's, this framework additionally acknowledges the involvement of other agents in the creative process (i.e., collaboration), the adoption by others of creations (i.e., consumption), and education to support the development of creativity (i.e., curricula). In another amendment of creativity frameworks, Sternberg and Karami (2022) proposed an 8P theoretical framework: purpose, press, persons, problems, processes, products, propulsion, and public. They chose to start with, and build upon, the four P's with purpose (i.e., whether creativity leaves a positive, negative, or mixed impact), problems (i.e., the nature of the task or situation, including whether convergent or divergent thinking is necessitated), propulsion (i.e., the direction and degree that ideas are situated relative to prior ideas), and public (i.e., the audience who supports, judges, and/or accepts creative products). Importantly, Sternberg and Karami (2022) state that a curriculum is not included in the 8P framework, as what and how creativity is taught is informed through, as opposed to part of, its theoretical framework. With constant updates of terminology and meaning that require re-structuring the field and re-organising the work

within it, these frameworks might be further muddling an already disparate field rather than providing the clarity and/or structure their thought exercises are intending.

Moreover, the most recently expanded frameworks have adversely narrowed their usefulness and applicability. For instance, Glăveanu (2013) stated that the five A's framework "is well equipped to capture different levels of creative expression, from celebrated achievements to everyday experiences" (p. 77). However, in presenting the 8P framework, Sternberg and Karami (2022) focus "primarily, although not exclusively, on Pro-c and Big-C creativity, rather than on the mini-c and little-c creative insights that everyone has in their lives" (p. 56), and, in doing so, acknowledge that, for example, it is primarily at the Pro-c and Big-C levels that the "public" plays a role. As such, they incidentally preserve one of their own concerns that previous creativity theories are incomplete and limited, as their 8P theoretical framework limits applicability through overspecification that is unable to capture all varieties of creativity.

Undoubtedly, creativity is multi-componential. Following its *interdependent* conceptualisation by Rhodes (1961), a function that has remained relatively overlooked, the components of creativity do not contribute additively or with independent influence, but rather the strands must thread together. As a result, another limitation of the theoretical framework approach is that, although these frameworks each support the need to account for differences across individuals and their environments, with the exception of the five A's, they often do not specify the relationships between their components, rendering them incomplete. It would be more valuable to have a representation that includes the fundamental components of creativity *and* positions them together.

Creativity Models

In addition to frameworks seeking to identify the components that contribute to creativity, researchers have sought to model how they function together. However, current approaches fall short in capturing the full scope of influential variables, as well as their interrelations.

Similar to the critiques that some creativity theories and research may over-emphasise one or a subset of the components of field-wide organising frameworks (Glăveanu, 2013; Sternberg & Karami, 2022), some models are incomplete as a result of focusing predominantly on deeply understanding a single contributing factor to creativity. For instance, despite acknowledging that an individual's mental operations sit within and

are broadly shaped by social, cultural, and environmental factors, one line of work has pursued fine-tuning understandings, theories, and models of the thinking processes and cognitive mechanisms that lead to creativity, as well as their interrelations (e.g., **Blind Variation and Selective Retention** (BVSR): Campbell, 1960; Simonton, 2023, the **associative theory of creativity**: Mednick, 1962, **Geneplore Model**: Finke et al., 1992). Others move beyond a single cognitive pathway but focus on conceptualising creativity as a **problem-solving process** (e.g., Görlich, 2023; Heard et al., 2023; Mumford et al., 2018; Sawyer, 2012; Torrance, 1965; Treffinger, 1995). In addition, with recent advancements of the field through the application of methodologies from neuroscience, Jauk's (2019) **bio-psycho-behavioral model of creativity** shows how neurobiological systems (e.g., dopaminergic system, default mode network, executive control network) set the foundation for psychological constructs (e.g., openness to experience, cognitive creative potential, intelligence), which lead to and moderate real-life creative behaviour (e.g., everyday creative activities, creative achievement). While each of these provides important insights and accounts for bidirectional and dynamic interrelationships, their primarily intra-individual focus is limited in understanding and application.

Another strand of work has endeavoured to comprehensively capture creativity, modelling both intraindividual and environmental variables, as well their interactions. Proposing a **componential framework for conceptualising creativity**, Amabile (1983) states

> that creativity is best conceptualised not as a personality trait or a general ability but as a behavior resulting from particular constellations of personal characteristics, cognitive abilities, and social environments. This behavior, which is evidenced in products or responses, can only be completely explained by a model that encompasses all three sets of factors. (p. 358)

To capture this, she presents a model in which creativity emerges from the multiplicative intersection of three components: domain-relevant skills (expertise: Amabile, 1998), creativity-relevant skills (creativity-relevant processes: Amabile, 1996; creative-thinking skills: Amabile, 1998), and task motivation (motivation: Amabile, 1998). While the components represent intra-individual factors, the componential theory of creativity considers social and environmental contexts through their influence on the components, with motivation being the most situationally sensitive (Amabile, 1983; Amabile, 1996; Amabile, 1998; Amabile & Pillemer, 2012). In fact, according to the Intrinsic Motivation

Principle of Creativity, intrinsic motivation facilitates creativity and can be driven by a variety of factors, both internally personal (e.g., passion, interest, enjoyment, autonomy, challenge, satisfaction, internal desire) and externally situational (e.g., peer competition, rules, surveillance, resources), as well as influenced by prior outcomes (Amabile, 1998; Amabile, 2003; Amabile, 1996). More recently, Amabile and Pratt (2016) revised the model to the *dynamic* componential model of creativity, which incorporates feedback loops that account for how creativity is influenced by whether an individual is making progress and engaging in personally meaningful work, as well as by their work orientation, affect, and cognitive-emotive states.

In explaining his **evolving systems approach to creative work**, Gruber (1988) proposes

> that the task of understanding creative work requires us to conceive of the creative person as an evolving system in an evolving milieu. Each such system is comprised of three subsystems -- organizations of knowledge, purpose, and affect. Each of these subsystems has a dual aspect: In one sense it has a life of its own, in another it contributes to the internal milieu of the others. (p. 32)

A pathway model, Woodman and Schoenfeldt's (1989) **Interactionist Model of Creative Behavior** represents creativity as

> the complex product of a person's behavior in a given situation. The situation can be characterized in terms of the contextual and social influences that either facilitate or inhibit creative accomplishment. The person is influenced by various antecedent conditions, and brings to bear both cognitive abilities and noncognitive traits or predispositions. (p. 89)

Further, creating a feedback loop, the consequences of an individual's behaviour influence the individual and the situation (i.e., contextual and social influences) and, thus, future creativity.

Harrington (1990) introduces an **ecological perspective on creativity**, modelling the ecology of creativity as arising through functional relationships and interdependencies among three key constructs: creative processes, personal resources, and ecosystem resources. According to this approach, creativity depends on a balancing of forces between (1) creative processes and personal resources and (2) creative processes and ecosystem resources. Psychosocial demands of creative processes are placed on both individuals and

their ecosystems; for the conditions of creativity to be established and creativity supported, both must meet these demands. When either the individual or the ecosystem (i.e., the environment) is unable to meet these demands, the creative process collapses, and creativity fails or becomes stunted.

In their **Investment Theory of Creativity**, Sternberg and Lubart (1991a) suggest that creativity originates from the convergence of environmental resources with five personal resources: intelligence, knowledge, intellectual style, personality, and motivation. The environmental context includes physical and social, proximal and societal, and evaluative considerations. The personal resources are further categorised by whether they are cognitive and/or affective-conative resources: intelligence and knowledge are considered cognitive resources, personality and motivation are considered affective-conative resources, and intellectual style is considered both a cognitive and an affective-conative resource. The interaction of these six resources results in domain-relevant creative abilities, some of which creative projects are developed from. Some of these projects further produce products; however, according to this conceptualisation, creativity only occurs when these products are evaluated as such by others.

Runco and Chand (1995) offer a **two-tier model of creative thinking**, which includes one tier composed of the process influences of motivation (i.e., intrinsic and extrinsic) and knowledge (e.g., declarative and procedural), and a second tier of problem-finding, ideation, and evaluation skills and abilities. Bi-directional arrows represent interactions between components on each tier *and* between the two tiers. Thus, this model contrasts with stage theories of creative problem-solving in that it reflects non-linear interrelations between problem-solving phases and their interactivity with the individual.

Csikszentmihalyi's (1996, 1999) **Systems View of Creativity** includes the individual and their personal background *and* "encompasses the environment in which the individual operates. This environment has two salient aspects: a cultural, or symbolic, aspect which here is called the domain; and a social aspect called the field" (Csikszentmihalyi, 1999, p. 314). As a result of these components,

> creativity occurs when a person, using the symbols of a given domain such as music, engineering, business, or mathematics, has a new idea or sees a new pattern, and when this novelty is selected by the appropriate field for inclusion into the relevant domain. (Csikszentmihalyi, 1996, p. 28)

The three components (i.e., individual, domain, field) are arranged together triadically and are each bidirectionally related to the others, such that creativity can only emerge through their combined interaction.

Urban's (2003) **Componential Model of Creativity** organises a multitude of variables into three cognitive components: divergent thinking and acting, general knowledge and thinking base, and specific knowledge base and area-specific skills *and* three personality components: focusing and task commitment, motivation and motives, and openness and tolerance of ambiguity. These six components converge in an overlapping form, but "the dynamics and mechanics of the componential functional system are dependent on discouraging/inhibiting or nurturing/stimulating/inspiring/cultivating influences of the various environmental subsystems in which the creative individual becomes active" (Urban, 2003, p. 101). As such, they also overlay and are dependent on three environmental subsystems: the individual environment, the group or local environment, and the societal, historical, global environment. These environmental subsystems each, to different degrees and from different levels of proximity, influence the development of creativity, the process of creativity at the intersection of its components, and the evaluation of creative products.

Kupers et al. (2019) present a **complex dynamic systems model of creativity**, with the particular aim of understanding children's creative development. In their model, the child, the other (i.e., the child's social environment), and the task (i.e., the material environment) are arranged triadically, with a bi-directional relationship between each pair. The creative process unfolds over time in an *iterative* fashion, with each triadic arrangement's state dependent on the preceding *and* informing the following state. The complex dynamic system in which this operates is used to illustrate that the individual and environment shape each other, and that creativity is *emergent* rather than externally driven. As a result, the system is variable and fluctuates over time, including intraindividually. In addition to proximal individual and environmental considerations, two more *levels* of each the individual (i.e., their creative (sub)products and creativity as personality) and their environment (i.e., the field and culture) are captured as surrounding and exerting influence through the two mechanisms of emergence and constraint. In this way, the model can be used to explore various time spans of creativity, as "the different levels range from moment-to-moment creative processes to creativity on the personal level

and creative development over the life span, both on the individual and the social dimension of creativity" (p. 94).

Richard et al. (2021) put forth the **Creative Potential System**, which consists of six overarching elements, each informed by its own set of contributing variables. There are three actor elements: cognitive skills, affective attributes/states, and physical expression *and* three environmental elements: the material world, micro-cultural values, and social interactions. Where these intersect, the individual's perceptions of environmental affordances influence their creative actions, either by facilitating or limiting them.

Finally, Tromp and Sternberg's (2022) **Person x Task x Situation Framework of Creativity** illustrates

> that creativity emerges from the nexus of the Person, Task, and Situation . . . Regardless of which element is the central or starting point of the analysis, the other 2 elements function as moderators that must be considered for a comprehensive understanding of creativity. (p. 555)

From this perspective, the person refers to the engaged individual, the task indicates what the person is doing, and the situation represents their context, including physical, social, cultural, and temporal aspects. Furthermore, the framework represents creativity as dynamic and the elements as synergistic, such that they are overlapping and interactive rather than independent.

These 11 creativity models each acknowledge that any explanation and, therefore, study of creativity must take into account the convergence of a variety of factors, both internal to the individual and external from their environment; however, their differences in factors and language highlight a field that is growing increasingly frayed. Informed by these models and in conjunction with key evidence from across the field, the next section proposes a synthesis model, discusses how it brings the core threads together, and explores key implications of its application.

Proposing a New Comprehensive Conceptualisation

Drawing upon and synthesising the creativity conceptualisations reviewed above, this section introduces the Creativity's Lifelong-Oriented Variables of Experience Representation (CLOVER) (see Figure 6.1) and discusses each defining factor and feature of the CLOVER's form. These include three leaflets, which represent individual and environmental components, and a stem, which represents that creativity is growth-

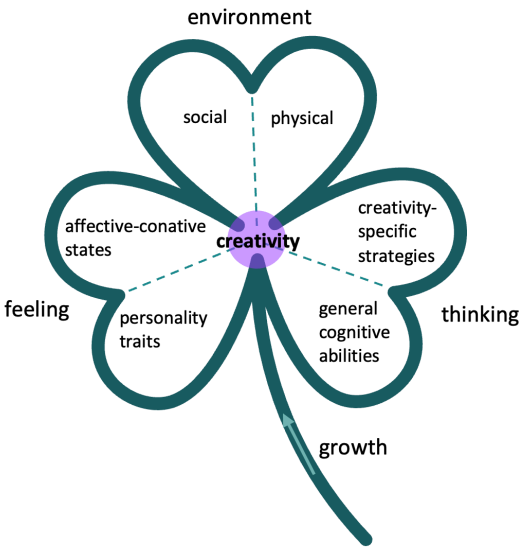
oriented. Then, the way in which these elements function together as a dynamic system of experiential engagement will be presented before addressing how this function supports the CLOVER's sensitivity to various contextualising dimensions, such as age and activity. Finally, factors excluded from the CLOVER will be reviewed, including luck and distal individual and environmental factors, alongside a discussion of how the CLOVER can be applied to still broadly account for their influences.

Three Leaflets: Thinking, Feeling, and the Environment

Although using diverse terminology and highlighting different elements, the models reviewed above acknowledge that any explanation and, therefore, study of creativity must consider factors both internal to the individual and external from their environment. In the CLOVER, three leaflets are used to represent three fundamental components that have been categorically identified to capture the diverse variables from across the existing creativity models reviewed above: "feeling", "thinking", and the "environment". Further, each leaflet uses the concept of its natural midrib to specify two important but distinct factors. It is depicted with a dotted, rather than solid, line to reflect their close relation and joint defining power as factoring into each component. For example, within the feeling leaflet, Conner and Silvia (2015) have identified that personality (i.e., personality traits) may modulate the influence of emotion (i.e., affective-conative states) on creativity.

Figure 6.1

Creativity's Lifelong-Oriented Variables of Experience Representation (CLOVER)



Individual

It is clear from the growth orientation necessary for creativity (see section 'Creativity is Growth-Oriented' above) that individual differences play a vital role in creativity and, thus, any complete model must consider variables of the individual. Four of the models incorporate the individual or person without further specification (Csikszentmihalyi, 1996, 1999; Harrington, 1990; Kupers et al., 2019; Tromp & Sternberg, 2022). The remaining models suggest that the consideration of two unique aspects of the individual is imperative: their (1) skill-based capabilities and knowledge-related aptitudes and (2) disposition. As such, in the CLOVER, two equally weighted leaves represent the individual's "thinking" and "feeling". While three of the models account for this essential broad-level distinction (i.e., Woodman & Schoenfeldt, 1989; Richard et al., 2021; Gruber, 1988), the remaining four further divide one or both of these components in distinguishable and important ways (i.e., Amabile, 1998; Runco & Chand, 1995; Sternberg & Lubart, 1991a; Urban, 2003).

Thinking

The two factors of the thinking component have been inspired by models that acknowledge a difference between individual abilities that contribute to creativity but are more universally applicable, and those that have been identified as having a greater degree of specificity in their relevance to creativity (e.g., Amabile, 1998: expertise versus creative-thinking skills; Urban, 2003: general knowledge and thinking base *and* specific knowledge base and area-specific skills versus divergent thinking and acting). In the CLOVER, these are termed (1) general cognitive abilities and (2) creativity-specific strategies. Variables included as part of the general cognitive abilities factor include knowledge (i.e., skills and expertise), intelligence, critical thinking, intellectual style, metacognition, working memory, cognitive flexibility, abstract thinking, executive function, cognitive control and attentional flexibility, and spatial ability (see section 'A Developmental Competency' above; see section 'Expertise' above). Creativity-specific strategies include skills (e.g., ideation/divergent thinking, evaluation/convergent thinking, possibility thinking) and techniques (e.g., brainstorming, perspective-taking, problem-solving heuristics) with a narrower width of applicability that is predominantly centred on creativity, as well as *creative* metacognition, or the ability to understand one's own creative capacities, know about creativity-specific strategies, and recognise when to utilise them (see section 'A Developmental Competency' above). It is important to acknowledge that the thinking leaflet encompasses abilities and strategies that

are intrinsic to development *and* those that are learned, which, as a result, can be taught and practiced (see section 'A Developmental Competency' above; see section 'Experience-Dependent and Opportunity-Linked' above).

The fine-grained models that focus on specifying and explaining the cognitive mechanisms and neurobiological systems behind creative thought would sit within the thinking leaflet (e.g., BVSR: Campbell, 1960; Simonton, 2023; Geneplore Model: Finke et al., 1992; bio-psycho-behavioral model of creativity: Jauk, 2019), illustrating their relevance in understanding an essential component of creativity, while also highlighting their incompleteness for broad application and comprehensive understanding across the field of creativity.

Feeling

Given that "emotion is no less important a tool than thinking" (Vygotsky, 1926/1997, p. 107), it is unsurprising that a dispositional component, the "feeling" leaflet, is essential to creativity. In fact, in reviewing research from across the field of creativity, Jung and Hunter (2023) suggest that "intelligence is necessary but not sufficient to achieve high creative achievement" (p. 361) and, further, conclude that openness to experience is the best predictive variable of creativity. While the majority of the field's existing models incorporate elements of disposition to some extent, they are much less compatible in their terminology and categorisation than thinking variables. Nonetheless, when examined across models, two core elements of feeling emerged: those which tend to be relatively stable and those that are apt to change over time and in direct response to situational conditions and contexts. In the CLOVER, these two factors are termed (1) personality traits and (2) affective-conative states.

The term "affective-conative" has been borrowed from Sternberg and Lubart (1991a); however, particularly as a less common term, it is imperative to note that the variables it represents in the CLOVER are different from those in the Investment Theory of Creativity, in which motivation, personality, and intellectual style are considered affective-conative resources, with intellectual style also considered a cognitive resource. Firstly, intellectual style would be considered only a thinking variable in the CLOVER; as a feeling variable, it could be modified to *working* style. Secondly, the distinction made in *separating* personality traits from affective-conative states and, further, in putting them on the same level in the CLOVER is supported by meta-analytic findings that creative people generally

share personality traits, which have some temporal stability (Feist, 1998). Moreover, although Urban (2003) includes motivation as one of several personality components, given its situational determinants (e.g., Amabile, 1983, 1989, 1996, 1998, 2003), it is considered an affective-conative state in the CLOVER.

Drawing this distinction between personality traits and affective-conative states is imperative, but, to date, it has not yet been clearly modelled. In the CLOVER, variables included as personality traits include those such as openness to experience, tolerance of ambiguity, independence, and willingness to take risks, while affective-conative states include variables such as motivation, enjoyment, interest, purpose, and mood.

Environment

Creativity cannot take place in a vacuum (e.g., Csikszentmihalyi, 1996, 1999; Guilford, 1950; Runco & Chand, 1995). Accordingly, in addition to the individual, all the approaches to model creativity reviewed above acknowledge that the environment plays a vital contributing factor. However, the ways in which the environment is incorporated vary significantly. Two of the models implicitly recognise environmental influence. This includes acknowledging the influence of an individual's social environment on their motivational component (Amabile, 1983) and considering the importance of the environment, such as environmental cues, in shaping creative thinking processes (Runco & Chand, 1995). Another two models, those proposed by Harrington (1990) and Sternberg and Lubart (1991a), explicitly acknowledge the environment, but without further specification. The remaining models are more complete in that they incorporate further specifications about environmental influences, but each does so differently.

Firstly, some models draw a distinction between *types* of environmental influence (e.g., contextual influences and social influences: Woodman and Schoenfeldt, 1989; other and task: Kupers et al., 2019; material world, social interactions, and micro-cultural values: Richard et al., 2021), and others qualify environmental influence by *level* (e.g., the individual, the group or local, and the societal, historical, global: Urban, 2003; proximal, field, and culture: Kupers et al., 2019). In fact, between models, different levels are at times emphasised; for instance, Gruber (1988) focuses primarily on a broad level (i.e., the evolving milieu), whereas Richard et al. (2021) discuss the difference between micro- and macro-culture, but then only position micro-cultural values within their model. The lack of consensus in how environmental influences on creativity are labelled could translate to a

disparate field, as well as research that is inadvertently self-limited by the model underpinning it. In their call for a more comprehensive approach, Tromp and Sternberg (2022) specified that the situation element be used inclusively, capturing various environmental types *and* levels: physical and social (i.e., proximal) and cultural and temporal elements (i.e., distal). While this classification *is* inclusive, the catch-all terminology simultaneously loses nuance, making it more difficult to identify and interpret the influence of individually distinct environmental factors.

Secondly, the *form* in which environmental factors are incorporated differs between models. For example, Urban (2003) considers environmental factors as "reference levels" within which the individual acts, such that the individual components overlay the environmental considerations. Similarly, Woodman and Schoenfeldt (1989) use a pathway model in which situational influences unidirectionally influence the individual. In contrast, Csikszentmihalyi (1996, 1999) and Kupers et al. (2019) place importance on the bi-directional relationship between the individual and their external or contextualising influences, and Richard et al. (2021) and Tromp and Sternberg (2022) use an overlapping model to illustrate the dynamic and interactional relationship between the individual and their environment.

In the CLOVER, the environment is included as a leaflet to illustrate the form of an interactive relationship between the individual and their immediate environment, rather than as a background shaper. Furthermore, the factors reflect the rich understandings in the field by making a distinction between *type* with the (1) physical environment and (2) social environment. Finally, the variables represented by the physical and social environments are limited to the proximal *level* of the circumstantial environment, or those that have the potential to change from moment-to-moment and/or be changed by the individual, rather than the distal and more immutable contextualising climate (e.g., historical time period, culture: see section 'Climate' below). As a result, the physical environment includes variables such as materials, resources, stimulation, and space, while the social environment captures variables such as role modelling, rewards, surveillance, instructions, trust, and climate at the *group/organisation* level. The significant influence of both the social and physical environments emphasises that creativity unfolds through an individual's (inter)active engagement with(in) their environment.

Componential Intersection: A Dynamic Systems Model

System

Reflecting reciprocal determinism (Bandura, 1978b; see section 'Reciprocal Determinism' in Chapter Three), Glăveanu (2011) suggests that "there is mounting evidence today that the creative process is not taking place 'in the mind' of the person, according to her intentions and plans, but actually is being played out in interactions with a physical and social world" (p. 127). Moreover, Harrington (1990) captures the significance of how objective contexts and conditions are subjectively experienced, stating that the relationships between the individual and their environment "may well determine whether the creativity of an ecosystem equals more or less than the sum of its parts" (p. 154). With the three leaflets coming together on a single leaf, the form of the CLOVER also illustrates the function of the components: creativity can only emerge from, and be understood through, the interaction of an individual's thinking *and* feeling *with* their environment. Importantly, this shows how the CLOVER can help move the field beyond the debate of whether creativity is a trait *or* a state by demonstrating how creativity is not only sensitive to, but dependent on, both trait *and* state variables.

Creativity Unfolds Over Time

That the function of the three components is not merely an additive, linear, or intersectional confluence, but rather an interdependent system, elucidates a key consideration: time. Time is considered in various ways across existing approaches. Some models do not explicitly incorporate time, but their authors discuss its significance. For instance, highlighting the role of time through sustained interactions and perseverance, Harrington (1990) writes that "if creativity is to occur, creatively active individuals and their ecosystems must initiate and sustain creative processes in the face of the powerful process-avoiding and process-terminating forces" (p. 157). Similarly, Csikszentmihalyi (1996) suggests that pausing allows more options to be considered, that being in a state of flow supports creativity, and that, in addition to ideas (i.e., variables of thinking) and openness (i.e., variables of feeling), an individual needs perseverance to be creative. Evidence also suggests that creativity can benefit from a period of incubation (e.g., Baird et al., 2012; Runco, 2014). Furthermore, Tromp and Sternberg (2022) consider time to be a critical moderator variable of the situation element in their model. In fact, meta-analytic findings suggest that longer time limits increase creativity scores on divergent thinking and product-

based tasks (Said-Metwaly et al., 2020), perhaps because uncommon associations generally increase over time (Benedek & Neubauer, 2013). Amabile (1983) proposed that creativity be conceptualized as a behaviour, and Richard et al. (2021) incorporated physical expression as an element of their model. Movement, action, and expression occur *during* an individual's (inter)action with(in) their environment, and, as such, these elements of creativity can only be comprehensively understood when time is acknowledged. Most explicitly, Urban (2003) includes "focusing and task commitment" as one of the six fundamental components in his model.

Some factors in the CLOVER are relatively stable across the time span of engagement (i.e., personality traits, general cognitive abilities, creativity-specific strategies), while others are situationally determined and/or (re)defined over the course of a single engagement (i.e., affective-conative states, the physical and social environment). Emphasising the significance of incorporating time in understanding creativity, evidence suggests that time interacts with both stable and situationally fluctuating variables. For example, the relationship between workplace creativity and time pressure depends on employees' openness to experience and their workplace support (Baer & Oldham, 2006). Moreover, creativity depends on the temporal contingency of contributing variables; for instance, it is not only the presence and degree of task constraints that impact creativity, but also *when* they are introduced into a task (Damadzic & Medeiros, 2022). It is evident that creativity unfolds through engagement. As such, it is essential that time is considered as an active variable at the components' convergence.

Creativity is an Experience

Creativity has been widely characterised as a *process*, a term used to denote a series of steps or phases. In fact, though viewed as a system, Kupers et al. (2019) model creativity as an *iterative* process, in which each state depends on the previous and informs the subsequent state. The CLOVER's form, in which its three components are represented as three leaflets that come together as a single leaf (see Figure 6.1), is, on the other hand, able to capture continuous interaction and mutual (re)definition. As a result, the CLOVER represents that creativity unfolds through the components' (re)mediation and/or (re)moderation of each other over a given span of time. This further highlights the limitations of conceptualising creativity as a multi-phase problem-solving process (see section 'Creativity Models' above).

It would be more accurate to conceptualise creativity as the change expressed through and/or resulting from an *experience* (see section 'Experience' in Chapter Three). Though many of the field's organising frameworks separate product and process in a way that has narrowed work and fuelled a debate over which creativity is (see section 'Theoretical Frameworks' above), through an experience lens, it becomes clear that these elements are indeed compatible and, moreover, jointly essential in understanding creativity. As such, utilising the CLOVER does not only allow for, but also demands, a more complete approach by incorporating the environment (e.g., press) and the individual (e.g., person) *and* by being able to account for both the product (i.e., experiential generativity) and the process (i.e., experiential engagement over time). Interestingly, it also becomes clear that creativity as an experience threads the strands of the four P's back together (Rhodes, 1961; see section 'Theoretical Frameworks' above).

The Distinct Contribution of Each Component to Creativity as a System

While it is necessary to consider each of the CLOVER's three components and their factors in order to understand creativity, each is distinctive in how it contributes to creativity. The environment represents an individual's *opportunity* to be creative—without an environment that allows, supports, and facilitates creativity, an individual's creative potential can be stifled. As a result of the systems approach, the opportunity for creativity is informed by the individual's perspective of environmental affordances (e.g., Richard et al., 2021), such that the same environment offers everyone a different opportunity. Thinking represents an individual's *capability* to be creative—without appropriate cognitive abilities and creativity strategies, an individual may lack the potential to be creative and, instead, might create in a way that is imitative or situationally irrelevant. Though an individual's thoughts and feelings both depend on their surroundings, it is the emotional lens that alters the impact of an experience or environment, meaning that all thoughts are rooted in affect (Vygotsky, 1987, as cited in Daniels, 2010). Therefore, cognition *depends on* affect, and, in turn, emotions filter not only what resonates in the present but also serve as a lens through which things become restructured or integrated. Thus, and lastly, even with an opportunistic environment and the capability to be creative, the individual must want to and choose to engage. In fact, reason and emotion are inseparable, such that "nothing important is achieved in life without a great deal of emotion" (Vygotsky, 1967/2004, p. 55). As a result, the feeling component can be considered the *catalyst* for creativity, where

apathy can create indifference and negative affect may lead to resistance—without the desire to engage, an individual's creative potential may remain dormant and/or the potential of environmental opportunities left untapped.

An incompatible or inadequate environment can prevent an individual's creative potential from being realised, while the lack of individual capability (i.e., thinking) or desire (i.e., feeling) can cause them to forgo environmental creative opportunities. In other words, without the inclusion of and consideration for thinking, feeling, *and* the environment, there is a breakdown in the system that limits, or even prohibits, creativity. As such, appreciating the differences between the factors and their contributions is crucial not only in modelling creativity in research, but also in enhancing it in practice. For instance, offering ways for an individual to develop only their thinking component would lead to capability-building, while supporting their feeling component could shift their mindset and, thus, encourage their propensity to act; however, focusing on both thinking and feeling together would result in a more effective capacity-building. Moreover, the inclusion of the environment indicates that individual factors are circumstantially responsive, meaning that changes in environmental variables would translate to changes in opportunities and, as a result, an individual's creativity, including its type and degree.

Finally, dividing the environment component by its physical environment and social environment factors furthers a nuanced understanding of creativity as experiential engagement and offers a distinction with great potential to meaningfully contribute to practice. For instance, variables of the social environment contribute to an individual's perception of psychological safety to demonstrate their creativity within a circumstance, whereas the physical environment provides the resources, such as tangible materials, that permit them to express it. As a result, vertically dividing the CLOVER down the centre highlights the distinction between possibility on the right and willingness on the left, or "can be" and "will be" creative, illustrating how creativity only functions via a synchrony of the "head" and "heart" and reflecting Maslow's (1993) consideration of creativity as part of, if not the same as, self-actualisation.

Dynamic

Creativity cannot be attributed to a single component, but rather each uniquely contributes to a system necessitating them all. Consequently, each factor of the CLOVER can introduce significant variability, illustrating how creativity can differ between individuals in

the same environment *and* for the same individual across different environments, as proposed by Guilford (1950). This also suggests that, while "the level of creativity of a product or response varies as a function of the levels of each of the three components" (Amabile, 1983, p. 367), there is no singular level for any component at which, if attained, creativity emerges. Acknowledging that creativity requires a balancing of forces between psychosocial demands and personal and environmental resources, Harrington (1990) explores the concept of person-environment fit, proposing that "the relevance of any particular *personal* characteristic to creative accomplishment may be a function of *ecosystem* characteristics" (p. 160, emphasis in original) *and* that "the relevance of any given characteristic of an *ecosystem* or *environment* will be a function of the *personal* characteristics of the individuals working within the ecosystem" (p. 160, emphasis in original). Although Amabile and Pratt (2016) use the term "dynamic" to represent cycles of creativity and the inclusion of feedback loops, Urban (2003), Kupers et al. (2019), and Tromp and Sternberg (2022) utilise "dynamic" to denote the phenomenon presently under consideration: the influence exerted by each component and the ways in which they interact can vary depending on characteristics of the individual, the environmental conditions they engage with, and the point in time they are along their engagement, which can lead to different types and degrees of creativity.

Under a *lack* of conditions, creativity is simply not possible. However, as long as a minimum threshold is attained for each component, responsivity through partial compensation can shift the interaction to rely more or less heavily on different factors, thus altering the person-environment fit and engagement, its potential generativity, and, ultimately, creativity. As such, conceptualising creativity as a dynamic system further highlights that creativity is not an additive function of its components. In fact, Jauk (2019) and Jung and Hunter (2023) describe intelligence as necessary but not itself sufficient for creativity, such that after a certain point of intelligence, greater intelligence is not correlated with creativity. In addition, while individuals need some knowledge to be creative, too much can actually *hinder* creativity (see section 'Expertise' above). The same threshold effect seen in individual variables also exists for environmental variables; for example, in the workplace, "an insufficiency of resources is associated with lower levels of creativity . . . [but] adding resources above a sufficient level may not add to creativity" (Amabile, 2003, p. 350). Moreover, dichotomous variables can work together to enhance

creativity, rather than as all-or-nothing continuums (e.g., mind wandering *and* mindfulness, intentionality *and* exploration) (Csikszentmihalyi, 1996). An important implication of recognising creativity as dynamic is the understanding that supporting or increasing any given contributing variable is not always a promising solution for enhancing creativity.

Incorporating Growth

Experiences are defined by two distinct spans of time: (1) the microexperience of engagement and (2) the macroexperience of the individual's ongoing life journey (see section 'Spans of Time' in Chapter Three). Thus, in addition to the dynamic system in which the three components interact over the course of the temporally bound engagement, conceptualising creativity as an experience not only enables, but requires, the explicit inclusion of creativity's growth orientation. In the CLOVER, this is represented by the stem. The stem is labelled "growth" rather than "development" because growth is a more inclusive term that is able to capture the natural (e.g., maturation) and intentional (e.g., teaching, training, intervention) development of skills and abilities over an individual's lifespan, as well as the influence of their unique experiences and opportunities.

The position of the stem is significant in two ways. Firstly, the stem directly connects to both the thinking and feeling leaflets, illustrating that it is the individual variables that can undergo growth, whereas environmental variables can only undergo change. Secondly, the stem intersects with the point at which all three components come together, representing that the creative experience itself can (re)shape the components that contributed towards it, and that, over time, these changes can nurture growth. For instance, motivational differences (i.e., feeling) influence the acquisition of expertise and skills (i.e., thinking) (Amabile, 1983; Urban, 2003). Without the stem accounting for growth, creative potential is portrayed as static and might consequently be repressed in practice. By adding an element that explicitly acknowledges this second dimension of time, the CLOVER serves the field as a more complete model of creativity and, further, can be applicable across the lifespan, essential in modelling and enhancing a crucial Lifelong Competency.

Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components

Children have less defined interests and fewer life experiences to draw from, transform, and be creative with (Ayman-Nolley, 1992; Vygotsky, 1926/1997), such that the age at which individuals make a *major* contribution to their field is higher in "fields requiring substantial training and life experience" (Mumford & Gustafson, 1988, p. 29). However,

children are also less self-conscious and more confident in their engagements, such that their everyday imagination is greater than that of adults (Vygotsky, 1967/2004). Furthermore, children are not only more emotional with their creativity (Vygotsky, 1967/2004), but also more strongly influenced by their affective states. For instance, meta-analytic evidence suggests that anxiety is more negatively related to creativity in children than adults (Byron & Khazanchi, 2011). Thus, in addition to being growth-orientated, a comprehensive creativity model must be dynamic in a way that is sensitive to an individual's age. One way to accommodate this is by recognising the shifting weight of componential influences across the lifespan. For instance, when applied to young children, Urban (2003) proposed using a partially developed version of his Componential Model of Creativity, in which he suggests that openness and tolerance of ambiguity play a major role, while specific knowledge and skills, which are less developed, a minor role.

It follows, then, that the components of the CLOVER may be differentially sensitive across the lifespan, including in their malleability (see section 'Critical Developmental Period in Childhood' above). For instance, meta-analytical evidence suggests that although creativity-related cognitive skills can be developed and supported through intervention, such training and practice may be less effective for young children than for older children and adults (Ma, 2006). Instead, Subotnik et al. (2022) suggest that "for preschool children, the most important components that can be actively cultivated by parents and educators are curiosity and openness to new experiences" (p. 506) (i.e., a focus on feeling) and then, in elementary school, helping them build creative thinking skills (i.e., a focus on thinking). In fact, to engage in creative writing, children first need motivation and material, and *then* technical skills (Vygotsky, 1967/2004). This recognition becomes particularly important for developing optimal creativity-enhancing practices.

Though children have less "capital of creativity" (Gardner, 1993), they also show less inhibition in harnessing it, such that the type of creativity they engage in and, therefore, the generativity it results in could require that it be identified differently. Nonetheless, age does not necessitate changing the conceptualisation of creativity in terms of componential form and function, making the CLOVER lifelong-oriented and applicable across the lifespan; however, it does demand shifting the balance of the components' weight as they interact. Compared to adults' creativity, children's creativity may be more susceptible to

environmental factors and depend more heavily on feeling factors, as opposed to thinking factors. As a result, children's creativity might also be more situationally sensitive.

Responsivity to Engaged Activity, but Forgoing a Component of Task and Domain

Evidence suggests that an individual's creativity differs across tasks and mediums of expression, as well as between domains, and that the influence of different engagement variables on creativity may differ between tasks (e.g., Kaufman, 2012; Potters et al., 2023; Ruscio et al., 1998). For instance, while general personality characteristics that broadly describe creative individuals have been identified, evidence suggests that these profiles exhibit distinctive patterns between domains (Feist, 1998; Feist, 2004; Kaufman, 2012; Kaufman et al., 2016). Additionally, creative anxiety manifests across all domains, but it does so to a different degree for each (Daker et al., 2020). Similar to how the creative engagement can inform the variables functioning through the feeling component and their strength of influence, the thinking component also illustrates how the CLOVER is sensitive to the influence of varying types and levels of task-related and domain-specific skills and knowledge (e.g., see section 'Expertise' above).

In the creativity models reviewed above, this is most closely represented by Sternberg and Lubart's (1991a) Investment Theory of Creativity, in which individual and environmental resources interact to create unique domain-relevant creative abilities. Tromp and Sternberg (2022) incorporate the task, defined "as what the person does—the problem in which they engage" (p. 553) as one of the necessary elements of their model, and Csikszentmihalyi (1996, 1999)'s model incorporates the domain in which an individual engages, suggesting the possible influence of domain-specific talent or innate ability. However, these aspects are not retained as *components* of the CLOVER. Instead, similar to age, elements of the creative engagement inform the prominence and influence of the CLOVER's modelled variables and contribute to determining the dynamic nature in which they interact across engagement, which, in turn, influences an individual's type and style of engagement, as well as the form and relevance of their expression (i.e., generativity).

Positing that a complete understanding of creativity is built on domain general and specific considerations, Baer and Kaufman (2017) developed the Amusement Park Theoretical (APT) Model of creativity to capture four levels of increasing domain specificity: Initial Requirements, General Thematic Areas, Domains, and Micro-domains. However comprehensive, the APT model does little to acknowledge how the increasingly specific

levels inform the composition and relevance of the more general factors, and the dynamic system through which they may interact. A more accurate and responsive way of viewing the domain general versus domain specific debate is that each variable contributing to creativity has a particular width of applicability (French & Buchner, 1999) or level of specificity (Amabile, 1996). This illustrates *how* the CLOVER could be dynamic in response to engagement and, thus, how creativity may *express* as domain specific, as some variables have a more general, or wider, applicability towards creativity (e.g., openness to new experience: Feist, 1998; executive functioning: Weisberg, 2023; creative self-identity: Karwowski et al., 2019), while others are more narrowly relevant to, and thus defined by, an individual's specific engagement (e.g., motivation: Amabile, 1996; specific content knowledge or expertise: Baer & Kaufman, 2017; emotional sensitivity: Feist, 1998; creative self-efficacy: Karwowski et al., 2019). In fact, evidence suggests that different variables predict creativity depending on the assessment used (Batey et al., 2010), and creativity training and interventions that aim to support creativity do not always transfer to similar tasks between domains (Baer, 2022; Dow & Mayer, 2004). Such findings could be a result of an interaction between general and specific elements.

Accurately being able to reflect and remain responsive to characteristics of an individual's engaged activity through the components of the CLOVER is not only important in understanding how to represent creativity, but also how to measure it and nurture its growth. Though the CLOVER itself does not specify *what* the engagement is, the arrangement and influence of the variables that contribute to any given engagement and its generativity are anchored in and sensitive to these considerations.

Spontaneity and Serendipity via Engagement, but Not Luck

Creativity is an experience (see section 'Componential Intersection: A Dynamic Systems Model' above), and an "experience cannot be completely controlled; chance always plays a role" (Runco, 2014, p. 387). By mere coincidence, the CLOVER lends itself easily for the addition of a potential, and aptly named, fourth leaflet: luck. However, even when creativity *appears* to generate as a flash of insight brought upon by fortuitous circumstance or accidental encounters, such chance is *not* attributed to luck. In fact, dependent on thinking abilities, the individual who can produce *more* ideas (e.g., fluency) will be more likely to come up with a creative one (Guilford, 1950), but this would need to be *recognised*. Moreover, personal attributes need adequate preparedness for fortuitous influences or

chance encounters to lead to change (Bandura, 1982). Thus, rather than luck, creativity can arise from moments of serendipity in which a "prepared mind" notices and is able to capitalise on an environmental opportunity or material affordance (e.g., Amabile, 1996; Glăveanu, 2020; Ross & Vallée-Tourangeau, 2021; Runco, 2014). This has implications for practice. For instance, creative problem-solving success differs based on how materials are presented (Isen et al., 1987), and participants score significantly higher on an Alternative Uses Task creativity assessment when they are in a messy versus orderly test-taking environment (Vohs et al., 2013), perhaps by breaking functional fixedness, allowing different affordances to be recognised, and inspiring deviations from convention.

Instead of adding another component or dimension to the CLOVER, chance is already captured through experiential engagement in that creativity unfolds between an individual, specifically a prepared individual, and their environment, including an unpredictably fluctuating one, over time and through interactive (re)definition. Bandura (1982) argues that "fortuitous influences may be unforeseen, but having occurred, they enter as evident factors in causal chains in the same way as prearranged ones do" (p. 749). Research examining creativity during artistic endeavours (e.g., bowl turning, egg decorating) and creative problem-solving has explored this process and shown how individuals' actions result in new sets of task conditions that, in turn, invite new actions (Glăveanu, 2014; Ross & Groves, 2023; Weisberg, 2023). Accounting for a creativity-specific form of individual-environment reciprocal determinism (Bandura, 1978b), Glăveanu (2020) presented a perspective-affordance theory of creativity (PAT). According to the PAT, an individual's perspective, which influences the personal creative potential of an opportunity, shifts during engagement and in response to new conditions brought about by their own actions, such that new potentialities of environmental affordances are revealed over time. These new affordances can lead to new creative actions that could, again, result in further perspective shifts and new perceived affordances to act upon. The recognition of an affordance is a moment during engagement that supports creativity, but not the creativity or generativity itself. Thus, even when creativity is recognised in a moment, which might resemble a flash of insight, it takes time and engagement to arrive at. This further substantiates the argument that temporal contingency of engagement has a deterministic role in understanding creativity (see section 'Creativity Unfolds Over Time' above), especially the role of chance.

The acknowledgement of chance also underscores the ongoing debate about whether creativity is intentional or spontaneous. While creativity *can* be intentional, it is evident that it can also be unpredictable, relying on emergence through environmental interactions and collaborative *improvisation* (e.g., Sawyer, 2012; Sawyer & DeZutter, 2009). Thus, though some researchers conceptualise creativity primarily as a problem-solving process (see section 'Creativity Models' above), it becomes clear that intentionality, such as striving for a solution to an identified goal-oriented problem, is *not* a necessary condition, rendering creative problem-solving approaches narrowly incomplete. In fact, conceptualised as an experience, Glăveanu and Beghetto (2021) suggest that "creative action is broadly intentional, yet the exact nature of one's intentions and goals are defined in and through the encounter" (p. 76).

Dynamic, temporally contingent, and unpredictable, creativity can arise *through* engagement and *with* fluidly changing circumstances, but not merely *from* engagement. Conceptualised as a Continuum of Effort, Runco (2014) places three degrees of intentionality on a scale, with "Spontaneity" on one end, "Let it Happen" in the middle, and "Deliberate Creativity" on the other end. To facilitate "Let it Happen" creativity, he suggests *removing* barriers, whereas "Deliberate Creativity" is *made to happen* via *applying* specific tactics. One important consequence of this is that children, who do not yet have as well-developed thinking factors, including general cognitive abilities and creativity-specific strategies, as well as the metacognition and discretion to apply them (see section 'Creativity is Growth-Oriented' above; see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components' above), may be less likely to engage in intentional or deliberate creativity. As a result, their creative activities are likely to be less goal-driven than those of adults, and, thus, supporting children's creativity may rely more heavily on allowing them time and space to be creative and removing circumstantial constraints that could hinder their engagement.

Growing From and Within

In addition to the variables of experience that influence creativity through the three components of the CLOVER and the dynamic system of engagement in which they interact, creativity grows *from* and grows *within* the larger context of an individual's life (see section 'Experience-Dependent and Opportunity-Linked' above). Not incorporated into the CLOVER

itself, distal considerations of both the individual and their environment can be recognised by placing the CLOVER into its broader surroundings of "soil" and "climate".

Soil

The concept of the "soil" represents what the CLOVER is planted in and, thus, serves as important contextualising information by acknowledging what the individual grows *from*. Variables captured by the soil that evidence suggests can influence creativity include the individual's built personal history (see section 'Experience-Dependent and Opportunity-Linked' above) and aspects of their social identity (e.g., birth order: Amabile, 1996; socioeconomic status: Liang et al., 2022). The soil closely resembles the "antecedent conditions" in Woodman and Schoenfeldt's (1989) Interactionist Model of Creative Behavior, which account for the influence of variables such as past reinforcement history, early socialisation, biographical variables (e.g., gender), and family position or birth order.

Climate

Similar to the systems of Bronfenbrenner's (1979) Ecological Systems Theory, many of the creativity models reviewed above incorporate more than one level of the environment, including an acknowledgment that creativity is experienced within a surrounding socio-political sphere and situated within distal environmental factors. The "climate" of where a CLOVER is planted can be used to illustrate the influences of these variables that creativity grows *within* (see section 'Experience-Dependent and Opportunity-Linked' above).

The climate primarily accounts for the individual's culture and the historical time period in which their creative engagement unfolds and generativity is expressed. While these two key elements of the climate are represented in an explicit and central manner in the majority of the models reviewed above (i.e., field: Csikszentmihalyi, 1996, 1999; evolving milieu: Gruber, 1988; field and culture: Kupers et al., 2019; evaluations of creative projects: Sternberg & Lubart, 1991a; situation: Tromp & Sternberg, 2022; societal, historical, global environment: Urban, 2003), the climate offers a unifying perspective that places them *outside* of the CLOVER itself. This is because many of the models that directly incorporate these aspects tend to define creativity in terms of social evaluation, value creation, or adoption by others, others who themselves exist in particular socio-cultural and spatiotemporal contexts that influence their perceptions. According to such product perspectives, "creativity is a thing or idea that exists outside of a person, which must be

produced or implemented in the world, and can be measured by its acceptance, enjoyment, and/or adoption by others" (Jung & Hunter, 2023, p. 357). For instance, Csikszentmihalyi (1998) has stated that "if creativity is to retain a useful meaning, it must refer to a process that results in an idea or product that is recognised and adopted by others" (p. 314), and, as a result, "it is the community and not the individual who makes creativity manifest" (p. 333). Along this strand of thinking, this means that the "criteria for creativity require a historically bound social context" (Amabile, 1983, p. 360). In other words, when the climate, as defined here, is incorporated as a primary component of a creativity model, it is done so with deterministic intention as a reference point to judge generativity.

While the negative effect of *expected evaluation* on creativity (e.g., Amabile, 1979) can be considered a variable of the direct social environment that influences engagement, evaluation or acceptance by the surrounding social sphere as the *determinant* of whether and how creative an individual's experiential generativity is *is not* retained in the CLOVER. The reason for this is that doing so would limit applicability. For instance, children, who have immature thinking leaflets and are still developing their own evaluative skills (Charles & Runco, 2001), would be greatly disadvantaged by such a criterion. Thus, while creativity is *expressed* instead of solely felt internally (e.g., imagination), this does not mean that the expression needs to be accepted or deemed as such by others. Without restricting the usefulness of the CLOVER, the climate importantly retains the *influence* of the surrounding social sphere. It follows, then, that it is essential to better understand what *would* constitute creativity, if not defined by a judgement of others within the individual's own climate.

Group Creativity

As indicated by the inclusion of the social environment as a factor of the environment component in the CLOVER, others exert a proximal influence on an individual's creativity (e.g., positive: role modelling, negative: surveillance) (see section 'Environment' above). However, individuals can also be engaged *together* in such a way that they are jointly contributing to collective creativity. Writing in response to evolving understandings of organisational creativity, Amabile and Pratt (2016) note "that not all group-level (or team-level) creativity is a simple aggregate of the individual creativity of group members" (p. 179). Instead, during these joint engagements of group creativity, each individual's contributions can alter the perceptions of and affordances available to other group members and, in turn, their actions (e.g., reciprocal determinism: Bandura: 1978b).

Although adult groups have been more widely studied, children also engage in group creativity that unfolds as a non-additive function of individual children's creativity. For example, as a result of being script-less, loosely outlined, and developed through collective decisions as to what "comes next", children's social pretend play is a form of group improvisation, where each child's individual creativity simultaneously sits within a collaboratively emerging creative social script (Sawyer, 1997).

A distinct phenomenon of creativity, group creativity does not always mean *greater* creativity. In fact, Plucker et al. (2004) claim it is one *myth* of creativity that "creativity is enhanced within a group" (p. 87). For example, brainstorming, a creativity-specific strategy, is more effective when group members first brainstorm *individually* and *then* share in a group setting rather than initially brainstorming together (Plucker et al., 2004; Sawyer, 2012). Runco (2003) further cautions that, in the classroom, "sharing may help with expression, collaboration and persuasion, each of which can be useful, but sharing can lead students toward conformity and away from personal interpretations" (p. 323). In addition, creativity can be hindered by interactions that have too much predictability, control, and scriptedness (Sawyer, 2012).

Group creativity also depends on *who* is working together. Though diverse groups support creativity by bringing together multiple perspectives, they can also increase conflict; as a result, diverse groups with a history of working together may be the most creative because they bring together complementary expertise, while also having already established shared conventions and knowledge (Sawyer, 2012). The balance of power between group members and how (mis)aligned they are in their expectations and goals are also important variables that contribute to how creative a group might be. For instance, equal participation among group members leads to greater creativity than when a select person exerts dominance (Sawyer, 2012), and groups are more creative when group members share purpose and commitment (Van der Vegt & Bunderson, 2005, as cited in Sawyer, 2012).

While Harrington (1990) has argued that social creativity can be contingent on recognising and building upon others' contributions *across* time and space, the present conceptualisation of group creativity is one in which individuals are not merely engaged with and building upon others' ideas and innovations—which would represent contributions to a broader creative climate (see section 'Climate' above)—but are also directly engaged

with at least one other individual during the temporally bound period of experiential engagement (see section 'Spans of Time' in Chapter Three). Furthermore, Lubart (2017) considers collaboration as occurring not only between different agents but also different *types* of agents, such that the use of the term "agents" is not limited to other humans but also encompasses computers. However, though they can responsively *prompt* creativity, social robotic partners (e.g., Ali, Devasia, et al., 2021; Ali, Park, & Breazeal, 2021) should not be considered as *group* creativity, as only a single individual is engaged and changed by the environmental interaction. This means that only one *experience* is undertaken. Group creativity, therefore, is reserved for creative activity in which two or more human participants are jointly participating in a shared generative engagement.

Finally, some have conceptualised creativity as *distributed* between individuals (e.g., Harrington, 1990; Sawyer & DeZutter, 2009). It is important to note that the CLOVER does not model group creativity as distributed, as creativity involves the *individual* and their subjective experience. Thus, while creativity is shaped by external factors and emerges over time through (re)definition between an individual and their environment, as an experience, creativity retains a degree of individuality. During group creativity, it is then necessary to consider the (in)compatibility between individuals' CLOVER models, but they do not merge.

Approaches to Defining Creativity From Across the Field

In his field-sparking address, Guilford (1950) asserted that "creativity refers to the abilities that are most characteristic of creative people" (p. 444), such that determining "creativity" still problematically, and quite circularly, would necessitate defining "creative" in the first instance *and* a way to identify these creative people before probing their characteristic abilities. While several approaches to defining creativity have been taken across the field since, and an abundance of definitions proposed within each approach, these are still largely limited by subjectivities and blurred boundaries, concerns that become increasingly problematic when applied to and operationalised for children's creativity.

A Limited "Standard Definition"

In response to a decentring of the trait perspective of creativity across the field, the definitional approach to creativity has shifted to accommodate the understanding that *all* individuals can be creative. As a result, creativity is largely defined by properties of a product; however, the definitional conundrum has persisted. In particular, creativity definitions themselves mostly rest on other difficult to define or operationalise terms,

making such definitions inherently impractical to serve as the foundation for a field of inquiry. For instance, Bruner (1979) defined creativity as "*effective surprise*", while noting straight after that "surprise is not easily defined" (p. 18).

Over time, the most common approach has become to define creativity as a product that is "new", "unusual", "surprising", "novel", or "original" *and* "useful", "meaningful", "valuable", or "task appropriate" (e.g., Amabile, 1983, 1996; Boden, 2001, 2004; Kaufman & Beghetto, 2013; Plucker et al., 2004; Richards, 2010; Robinson, 2009). Despite researchers using various synonyms, backed by this widespread application, Runco and Jaeger (2012) asserted that "the *standard definition* is bipartite: Creativity requires both originality and effectiveness" (p. 92, emphasis added). Although Rhodes (1961) stated that "there is no standard system for organizing artifacts according to idea value or degree of originality" (p. 309), attempts *have* been made to illustrate that these defining elements are indeed operational, and thus, that this definition is acceptable. For example, Runco (2004) posits that originality can be measured by statistical infrequency. However, other research suggests a problematic difference between these terms that are being used to define and identify creativity and creativity itself. For instance, evidence suggests that while asking people to be creative *does* increase their creativity, as measured by divergent thinking tasks, asking them to be original does *not* (Acar et al., 2020). Another line of work has underlined concerns that defining creativity by these terms still remains vague, as they might themselves conflate distinguishable sub-categories. For example, notwithstanding a lack of uniformity of operationalising "appropriateness" across the work on creativity, evidence suggests that appropriateness be separated into "impact" and "feasibility" (Chan & Schunn, 2023). In fact, Runco and Jaeger (2012) themselves acknowledge that "there are questions about the number of criteria that should be used in a definition of creativity. The standard view points to two criteria, but perhaps there are more—or fewer!" (p. 95). While the "standard" for defining creativity has been set by its regular use across the field, it is clear that the unquestioned frequency of application and utilisation should not be what drives a benchmark.

Subjectivities in operationalising the "standard definition" make it anything but standard under the surface. This becomes increasingly problematic when considering who it is applying these defining criteria, as Runco and Jaeger (2012) further state that "the standard definition only pinpoints which criteria must be used; it does not say anything

about who is to judge each, and who is to judge the judges" (p. 95). Emphasising the subjectivity that could be introduced in the application of these definitions, Csikszentmihalyi (1999) writes that "expert judges do not possess an external, objective standard by which to evaluate "creative" responses. Their judgements rely on past experience, training, cultural biases, current trends, personal values, idiosyncratic preferences" (p. 314). As judgements of novelty and usefulness are limited to one's own knowledge and by one's own experience, these judgements are inherently personal; however, personal criteria limit the ability for an individual to judge others' creativity (e.g., Corazza, 2016; Runco, 1996). It follows, then, that creativity according to this approach is determined by socio-cultural and sociotemporal contexts, and thus "creativity is as much the result of changing standards and new criteria of assessment, as it is of novel individual achievements" (Csikszentmihalyi, 1999, p. 321), which would preclude some creativities from being recognised (see section 'Climate' above).

Additionally, evidence shows that implicit definitions differ between cultures (Lim & Plucker, 2001; Runco & Johnson, 2002), only partially overlap between laypersons and academics (Sternberg, 1985, as cited in Kaufman & Baer, 2004), and, moreover, that these differing implicit definitions influence the way one's own creativity is viewed, as well as the creativity of others (Kaufman & Baer, 2004). In response to the contextually subjective dependencies of creative judgement, Corazza (2016) proposed a dynamic definition that could account for both creative achievement and creative inconclusiveness by suggesting that the originality and effectiveness of creativity only needs to be *potential.* Problematically, it could be argued that everything might have potential to someone, somewhere, at some point in time. As a result, though the system through which creativity unfolds is dynamic, a dynamic definition is not a suitable resolution to the definitional challenge facing the field. Lastly, researchers have begun harnessing technology and the power of machine learning to automate scoring. However, consistency does not mean objectivity or accuracy, as findings suggest that creativity scores depend on the corpus and semantic model selected for verbal creativity task formats and the number of training samples and the population used for training in non-verbal expressions (Anderson et al., 2025; Cropley & Marrone, 2025; Jaschek et al., 2023; Koutstaal et al., 2025; Marrone et al., 2023).

A final key criticism of these definitions is that the focus on novelty and usefulness narrows the definition from the multiple strands of creativity, including the creative process,

to a strong focus on static product characteristics. As a result, though product-orientations permit *something* for others to assess, this widely implemented perspective is similarly as short-sighted as person-centred definitions and could constrain the field. Instead, and through the lens of an *experience*, a complete definition of creativity must be able to account for the individual, their generativity, *and* their engagement with their environment.

Heightened Limitations for Children's Creativity

Defining creativity by originality or novelty is particularly problematic when applied to children's creativity. For instance, on the basis that creativity is marked by transforming a field or pushing a domain forward by producing and contributing something objectively new *to the world*, Csikszentmihalyi (1996) wrote that, "children cannot be creative, but all creative adults were once children" (p. 156). Additionally, Simonton (1997) contended that "the initial years of an individual's life may be termed the *developmental period.* During this stage the individual is not really productive creatively, but may or may not acquire a creative potential because of various early experiences" (p. 4, emphasis in original). In fact, studies of eminent creativity, or creativity that influences an entire field, find that a 10-year period of preparation is beneficial (Gardner, 1993; Kaufman & Baer, 2004), which would automatically disqualify young children. Although it is indeed reasonable that something objectively new to the world can be considered creative, the two are not mutually exclusive; suggesting that they are introduces a detrimental blind spot into the field. In fact, even in adults, though the frequency of their self-reported creative *achievements* has a positive skewness, their creative *activities* are normally distributed (Jauk et al., 2014). While understandings in the field have benefitted from examining the lives of eminent creatives, it is an inherently limiting perspective that disregards children's creativity. Rather than *not* being creative, one perspective is that "children's creativity is often only original in reference to personal norms and not outstanding when compared with eminent standards" (Runco, 2003, p. 319).

A common approach taken by researchers endeavouring to accommodate novices' and children's creativity is shrinking the sphere of influence necessary for a product to qualify as novel and meaningful, as well as their often-used synonyms. In other words, the product-oriented criteria remain, but they are instead defined in terms of a smaller audience, such as when something is personally new only to the individual rather than in definite terms to all of humanity. The most widely recognised application of this

conceptualisation is the Four C model, which uses a continuum of increasing scope: mini-c creativity, which is subjectively new and meaningful *to the individual* but not objectively to the world; little-c creativity, which is interpersonally judged, but at an everyday and local level, such as by one's direct peers; Pro-c creativity, which is judged by an increasing magnitude or expanding sphere of an individual's audience, moving from little-c creativity to a professional level; and Big-C creativity, which recognises eminent creativity at the societal level and that drives progress (Beghetto & Kaufman, 2007; Kaufman & Beghetto, 2013). Another conceptualisation differentiates between two levels for judging creativity: psychological or P-creativity, which is a personal level, and historical or H-creativity, which refers to something nobody else has thought and/or done (Boden, 2004). Similarly, Harrington (1990) differentiates between private creativity, or creativity that holds value and impact to only the individual, and social creativity, or creativity that has value to and impact on others. Other terms drawing this distinction that have been used at the level of children's creativity include "everyday creativity" (e.g., Richards, 2010), and "personal creativity" (e.g., Runco, 1996).

While these definitional adaptations might appear, on the surface, to be reasonable for evaluating children's creativity, this approach, which is marked by varying stages, scopes, or levels of novelty and originality, introduces increasing subjectivity as the sphere of comparison decreases, as one can never determine what might be new to another with full confidence. Thus, these definitions are counterproductively less useful as creativity becomes more personal. Additionally, while refashioning an eminent or adult definition might illustrate progression based on experience or expertise, it does little to leave space to consider and account for developmental differences. In fact, novice or non-expert level creativity is *not* equivalent to a child's version of creativity (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components'). As such, children's creativity is not merely a less influential or prominent form of adult's creativity or eminent creativity. Rather than updating and adding caveats or clarifications to adult and eminent definitions that shrink the sphere of influence or level of judgement, children's creativity would be best defined another way, one in which children and their abilities and contexts, not adults', serve as the starting point.

Relying on Similar Constructs

At times, researchers have chosen to sidestep the challenge of defining creativity. One way in which they have done this is by relying on similar constructs. For instance, acknowledging a difference from adults' creativity but highlighting problems in the current field of children's creativity, "researchers are turning to constructs such as curiosity, exploration, and innovation that are related to creativity, and are more definable and subject to rigorous empirical study" (Evans et al., 2022, p. 112). However, despite being *related* to creativity, these constructs remain distinct from it (e.g., innovation: Carr et al., 2016; Levitt, 2002). Additionally, though exploration is important for building a reservoir to draw from during creativity, it, in and of itself, is not sufficient to constitute creativity. For example, it is within a specified goal-directed creativity task that requires convergent thinking in which exploration has shown relevance to creativity (Evans et al., 2021), and such constraints are not intrinsic to many episodes of exploration or creativity. Moreover, to avoid some of the subjectivities of judging creativity (e.g., culture), the PISA focuses on *creative thinking*, which "refers to the *cognitive processes* required to engage in creative work" (OECD, 2022, p. 11, emphasis added). However, creativity necessitates more than cognitive processes (see section 'Componential Intersection: A Dynamic Systems Model' above). In fact, children's creativity may rely *less* on cognitive factors than adults' creativity (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components' above).

Another strand of work has defined creativity in terms of a problem-solving process. For instance, Selby et al. (2005) state that "at times in this review, the terms *creativity* and *problem solving* are used interchangeably. The intention is not to blur distinctions that others may feel are necessary; rather it is to reinforce the commonality between the two" (p. 301, emphasis in original). However, during a creativity definition development phase, Heard et al. (2023) received teacher feedback that "revealed that the relationship [they] were establishing between creativity and problem solving needed to be further explained" (p. 2). This inherent uncertainty further elucidates a distinction where, notwithstanding previously discussed limitations of experiential engagement and intentionality (see section 'Creativity is an Experience' above; see section 'Spontaneity and Serendipity via Engagement, but Not Luck' above), creativity cannot usefully be defined as or in terms of problem-solving. Moreover, when distinguishing solutions that arise through critical

thinking versus creative problem-solving, the difference would seem to lie in the criteria that the outcome or solution be novel or uncommon, causing one to simply revisit the issues of subjectivity of a standard definition, as discussed above.

A different approach to the challenge of defining and operationalising creativity has been an overreliance on one variable that contributes to creativity. For instance, Zosh et al. (2017) "suggest that we put a stake in the ground and define creativity for the moment as divergent thinking" (p. 177). In fact, divergent thinking tests, or the ability to generate multiple alternative solutions to a given situation or problem, have been the most common way to measure creativity (e.g., Long, 2014). However, as shown by the CLOVER, divergent thinking is only one variable of the creativity-specific strategies factor, which is only one half of the thinking component. It is, then, unsurprising that a wealth of evidence suggests that divergent thinking scores and real-world creativity are not strongly related (e.g., Gardner, 1993; Sawyer, 2012). Other approaches that may similarly *narrow* creativity work include associative thinking (Mednick, 1962) and possibility thinking (Craft, 1999).

As it is not reliable to define or assess creativity by constructs that might show promising correlation but remain "conceptually distinct from the creativity construct" (Hocevar & Bachelor, 1987, p. 63), drawing upon and attributing creativity to similar constructs or contributing variables, no matter how significant their relatedness or contribution, has the potential to hold the field of creativity back. It is, therefore, imperative to draw clear and thoughtful boundaries when defining creativity to ensure that conflation does not further muddle an already difficult-to-define term.

Leaving Creativity Undefined

In acknowledgment of, and opposition to, problems that have arisen when defining creativity, there is also a line of work that has avoided defining creativity altogether. This approach rests on the argument that because creativity is implicitly recognisable, it might not be necessary to define it in order for it to retain usefulness (Silvia, 2018). This has been supported by research using the Consensual Assessment Technique (CAT) to assess creativity, which demonstrates that the consensual judgement of expert raters using their own subjective definitions can be sufficient, valid, and reliable in evaluating others' product-based creativity (e.g., Amabile, 1982). Amabile (1996) later suggested that the experts used as raters only need some knowledge or familiarity. However, evidence suggests that others' subjective ratings may not be particularly accurate, as they often conflate creativity with

other constructs (e.g., IQ) (Hocevar & Bachelor, 1987). Moreover, "relying on expert judges can introduce a kind of inconsistency even with specified criteria for making judgments. Judges may hold discrepant views due to varying levels of ability or skill, or differences in motivation and interest" (Runco & Chand, 1995, p. 263). Notwithstanding concerns of subjectivity when creativity is externally evaluated (see section 'Climate' above; see section 'A Limited "Standard Definition"' above), this approach becomes especially problematic for the study of children because adults are no longer experts at, or personally knowledgeable about, being children. Evidence suggests that expert, quasi-experts, and novice raters may not be interchangeable (Hu et al., 2023; Kaufman et al., 2013). As a result, adults might not be capable of identifying what constitutes children's creativity. In fact, Dumas et al. (2023) identified that there is significantly greater inter-rater variance when assessing younger children's creativity test responses compared to older children's, and they recommend exploring using children as raters instead of adults.

Illustrating a trend of leaving creativity undefined, across 90 peer-reviewed articles, Plucker et al. (2004) found that creativity was only explicitly defined in 38% of the articles. From the definitions that were identified, they offered the following definition: "Creativity is the interaction among *aptitude, process, and environment* by which an individual or group produces a *perceptible product* that is both *novel and useful* as defined within a *social context"* (p. 90, emphasis in original). However, while synthesising the field and combining existing definitions does resolve some concerns, it also compounds their limitations rather than reduces them.

Moving Towards Definitions of Engagement

As new understandings continue to shape the field of creativity, researchers have begun defining creativity less as a product and increasingly in ways that emphasise experiential engagement. For example, Glăveanu and Beghetto (2021) write that "a creative experience can be defined as *novel person-world encounters grounded in meaningful actions and interactions, which are marked by the principles of: open-endedness nonlinearity, pluri-perspectives and future-orientation*" (p. 76, emphasis in original). In addition, Green et al. (2024) "propose a process definition of creativity as *internal attention constrained by a generative goal*" (p. 11, emphasis in original). While a promising direction for the field, these definitions do not do enough to resolve the concerns of definitions and their operationalisations discussed above, particularly in relation to children's creativity. For

instance, Glăveanu and Beghetto (2021) note that while they go beyond "novelty" and "meaningfulness", they retain these from the "standard definition" as important characteristics. Moreover, while Green et al. (2024) acknowledge an individually-dependent engagement that strives towards generativity, they do less to acknowledge the experiential environment that this process functions with(in). Additionally, while they argue that their definition is broadly applicable, their constraint-goal emphasis could risk being conflated with problem-solving.

Proposing and Defining a Sub-Construct: "Child Creativity"

It is evident that subjectivity and blurred boundaries have plagued definitions of creativity from becoming as useful as they could be. In particular, modifying adult definitions, relying on related constructs, and even avoiding a definition altogether have served more to amplify definitional limitations than to increase relevance to and applicability for children's creativity. In order to do meaningful work to better understand children's creativity and enhance it in practice, it is imperative to establish a shared language that can both frame discussions of and identify children's creativity. One way of doing this is through a distinct sub-construct of creativity: *child creativity*. Child creativity is defined here as *the integration of something that is not already in the present moment and context into the present moment and context*.

The use of the term "something" is not meant to be vague, but rather intentionally open-ended to ensure that the definition does not limit the scope of engagement to certain styles or forms of creative engagements (e.g., activities, tasks), including to specific domains (e.g., art, science, language), uses (e.g., self-expression, problem-solving, humour), or communicative manifestations (e.g., behavioural action, material representation, verbal description).

This definition of child creativity acknowledges the child's immediate spatiotemporal environment, or their "present moment and context", which is important for several reasons. Firstly, as creativity is an experience that unfolds through a dynamic system of its components, any definition of child creativity must capture the child's engagement with their environment, an environment that is bounded in time and space (see section 'Experience' in Chapter Three; see section 'Componential Intersection: A Dynamic Systems Model' above). Secondly, starting with the child's "present moment and context" allows it to serve as a known comparative anchor, one that can be a material and conceptual space

frame. This eliminates the need to make a judgement against an individual's personal history, reducing subjectivity of definitions that must determine what might be "new" relative to personal standards. It also removes the need to norm against others' performances, allowing for a greater sensitivity to the individuality of an experience (see section 'Individuality' in Chapter Three). Moreover, without requiring social judgements or comparisons, this definition could retain relevance across cultures and reduce the influence of individuals' subjective lenses informed by their own implicit definitions (see section 'A Limited "Standard Definition"' above). Thirdly, the requirement of a child bringing things together in the present that had been *displaced* by time and context illustrates that child creativity is simultaneously internal and external. Thus, this definition is able to capture both the previously experienced, such as making connections that draw on prior concrete experiences or memories (e.g., trying a solution out in a new context, enacting a known but typically adult role in pretend play), *and* the unexperienced, such as realising imagined possibilities from mental imagery or internal states (e.g., self-expression of internal concepts, assuming a different perspective).

A possible reason for the conflation between constructs when turning away from product definitions, particularly in children (see section 'Relying on Similar Constructs' above), is that there is no verb to describe the experience of creativity as there is of imagination, exploration, innovation, etc. (i.e., imagining, exploring, innovating, etc.). Problematically, "creating" is often used, which blurs an important boundary in that creating something could also indicate making an imitation of what is in the present, such as the construction of a replica. For instance, Vygotsky drew a distinction between reproductive construction, or derived from imitation, and combinatory construction, where something new (i.e., creative) emerges from altering and/or restructuring what has already been (Ayman-Nolley, 1992). The incorporation of the concept of displacement that is rooted in and determined by the child's immediate spatiotemporal environment, indicated by the idea that what becomes integrated must not already be in the present moment and context, allows the definition of child creativity presented here to differentiate creativity from an engagement that is productive but *not* creative. The qualification of across time and context is, thus, also intended to preclude imitation, replication, reproduction, and following directions.

The term “integration” is significant in several ways. Firstly, as an experience (see section ‘Creativity is an Experience’ above), any complete definition of creativity must move beyond limited product orientations (i.e., generativity) to also include an individual’s engagement unfolding over time. “Integration” satisfies this requirement, as it represents a period of interaction through which things have been brought together. At the same time, “integration” is not restrictive and, thus, captures various possible types, styles, and forms of engagement and generativity (see section ‘Responsivity to Engaged Activity, but Forgoing a Component of Task and Domain’ above). As such, it neither dictates which factors have more weight (see section ‘Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components’ above), nor demands a progression (e.g., stages of problem-solving models: see section ‘Spontaneity and Serendipity via Engagement, but Not Luck’ above). Further, integration indicates that creativity necessitates more than internally noticing a link or making a mental connection with something (e.g., imagination, wondering, ideation); it requires combining and *exemplifying* it externally. This illustrates how an individual’s environment could stifle their creative potential if there is no opportunity to express creativity, thereby falling short of generativity altogether (see section ‘The Distinct Contribution of Each Component to Creativity as a System’ above). That the definition indicates that the integration is in relation to the *child’s present* importantly draws a boundary from innovation, which extends the implementation of creative ideas towards wider application (e.g., Carr et al., 2016; Levitt, 2002). Thus, though creativity serves as a precursor towards innovation, it is not the same as innovation, which would necessitate an integration that has progressed *beyond* an individual’s present moment and context.

Children’s creativity may have less intentionality than adults’ (e.g., Glăveanu, 2011; Runco, 1996; see section ‘Spontaneity and Serendipity via Engagement, but Not Luck’ above). The concept of integration implies an individual’s underlying recognition of relevance; therefore, this definition can accommodate children’s creativity that is not always intentional but instead emerges spontaneously or serendipitously across an episode and/or through improvisation, whether individually or with others (see section ‘Group Creativity’ above). Upon being recognised as applicable, it becomes integrated not just externally in context, but internally too. In this way, discovery, experimentation, exploration, and other similar *ways* of learning can support creativity by bringing fresh insights and ideas for a child to integrate (see section ‘Experience-Dependent and

Opportunity-Linked' above); however, these active processes are not expressions of integration in and of themselves, further clarifying their distinction from creativity (see section 'Relying on Similar Constructs' above). Of note is that integration can be exemplified through an attempt or trial-and-error and does not have to be successful. While the generativity of child creativity might not always be successful, child creativity is typically marked by positive affect (e.g., (self-)satisfaction, pride, joy). However, if two or more things are too displaced that even an attempt at integration cannot be meaningfully made, this may be deemed as nonsensical or bizarre, but would not qualify as creativity.

This definition of child creativity does not take a stage or a level approach; however, it can be utilised to gauge the degree of a child's creativity at a given time and within a given environment. For instance, the degree of creativity could be informed by whether the displacement from the present moment and context was a near or far connection and/or the level to which it was cued or prompted before integration. For example, during pretend play, a child who enacts a storyline in the role of a fisherman with a pre-defined playset of a plastic fishing rod and plastic fish would be less creative than a child who brings the behaviour and storyline of fishing *and the idea* to other objects, such as using a stick as a fishing rod and leaves as fish.

Age

The specification of a sub-construct of *child* creativity implies the need to determine what constitutes a "child". Included in their framework as "purpose", Sternberg and Karami (2022) discuss the distinctions between positive, negative, and mixed creativity, whereby positive creativity ultimately *benefits* a field, domain, or society; negative creativity *degrades* a field, domain, or society; and mixed creativity results in change that does not necessarily do either. Children are less inhibited in their creative engagements and more confident in their products than adults (Vygotsky, 1967/2004). Given their less constrained and more fantastical thinking, "Vygotsky emphasized the *subjective* nature of the creativity of children, which is egocentric and takes little account of the strict rules of reality or the social conventions" (Cropley, 2001, p. 91, emphasis in original). However, this is not necessarily a reflection of defying conventions because children are still working to understand social norms and are, as a result, less aware of conventions (Runco, 1996). In fact, evidence suggests that children are still developing their ability to gauge appropriateness and their skills to evaluate creativity (Charles & Runco, 2001; see section

'Critical Developmental Period in Childhood' above). This can be represented in the CLOVER as a dynamic system, as the thinking leaflet is underdeveloped and has less weight for children's creativity (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components'). Thus, the definition of child creativity presented here specifically does not determine "good" versus "bad" creativity, but rather simply that integration occurred, as it is futile to judge children on a dimension that they cannot yet judge themselves.

Informed by research on moral development that indicates late childhood (i.e., 9–12-years-old) as the beginning of a crucial transition beyond the superficiality that marks early childhood, a transition that decentres considerations of the self (Gibbs, 2019), "child creativity" indicates creativity in individuals through age eight. Interestingly, age nine has been acknowledged in the field of creativity as a time when children begin conforming to their peers (e.g., Amabile, 1989), although the field has not yet drawn a boundary for a sub-construct of child creativity. It is essential to recognise that this is one significant way in which a growth-oriented perspective differs between developmental and expertise-related growth, or between children and novices or non-experts.

Children's Creativity in Context

Although everyone has creative potential*,* creativity does not simply spring forth. As illustrated by the CLOVER and the dynamic system through which its components function, an environmental opportunity is a prerequisite for creativity; however, it is not in and of itself sufficient (see section 'The Distinct Contribution of Each Component to Creativity as a System' above). Rather, the social and physical environments interact with the individual to shape their experience, such that where and who an individual is with contribute significantly to their creative engagement, generativity, and growth. Returning to Bronfenbrenner's (1979) proposal that, "different kinds of settings give rise to distinctive patterns of role, activity, and relation for persons who become participants in these settings" (p. 109; also see section 'Roles' in Chapter Three), but with a greater focus on the activity than the individual's role, evidence suggests that creative activity does vary by setting (Runco et al., 2017; Runco et al., 2022; Shah & Gustafsson, 2021). Moreover, an individual's environmental conditions, situations, and contexts can contribute to enhancing creativity in two different ways: (1) by supporting discrete episodes of creativity that are temporally bound and (2) by nurturing the growth of creativity over a longer time span.

Importantly, not all creativity-supporting engagements can automatically be assumed to also qualify as creativity-nurturing, though it is improbable that creativity could be nurtured if it has not first been supported.

The Children's Museum

Given the significance of the environment for creativity, Abdulla and Cramond (2017) stressed that, to be creative, "you will always need an environment that is encouraging and psychologically safe, an environment that offers you opportunities, and, most important, an environment that values creativity and creative thinking" (p. 17). As indicated by term frequency, mission statement analysis suggests that creativity is *valued* by children's museums (see Chapter Five, Kupiec, 2024). Furthermore, the Visitor Experiencescape and the CLOVER are complementary in ways that suggest children's museum experiences, particularly those during family visits, could be a promising context to holistically support and nurture children's creativity. In fact, literature review findings suggest "that taking children and young people out of school to work in environments such as museums and galleries enhances their creative skills" (Davies et al., 2013, p. 87).

Supporting Children's Creativity

Creativity necessitates that a minimum threshold of each component of the CLOVER be attained (see section 'Dynamic' above). The thinking leaflet of the CLOVER illustrates that, in any given experience, creativity benefits from themes and activities in which individuals have met a minimum level of skills and expertise. Children's museums have been defined as museums that cater to young audiences and their caregivers through *developmentally appropriate themes* and interactive materials (see section 'What?' in Chapter Two). With design rooted in an understanding of children, their contexts, and their behaviours, children's museums satisfy a basic threshold to not only permit, but also invite, children's creativity.

In addition to considerations of the thinking leaflet, and perhaps more central to creativity in children's museums because of the stronger influence of the feeling leaflet for children's creativity (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components'), children's museums are well poised to elicit creativity-supporting affective-conative states. A wealth of evidence shows that enjoyment and positive moods, emotions, and perceptions enhance creativity across all ages (Amabile, 2003; Baas et al., 2008; Celume et al., 2023; Hennessey & Amabile, 1987; Greene & Noice, 1988; Isen et al.,

1987), and findings from experience sampling and diary methodologies suggest that positive emotional states, particularly those that are high-activation (e.g., happy as opposed to relaxed), are positively related to the extent to which adults engage in creative activities in their day-to-day lives and at work (Amabile et al., 2005; Conner & Silvia, 2015; Silvia et al., 2014). Moreover, the emotional tone of an individual's environmental can influence their creativity; for instance, evidence suggests that "happy music" facilitates creative cognition (Ritter & Ferguson, 2017). On the other hand, there is mixed evidence regarding the influence that negative emotions have on creativity. Some work has shown that negative emotions are unrelated to or might decrease creativity (e.g., Baas et al., 2008; Conner & Silvia, 2015). However, other findings suggest that negative emotional states can increase creativity in both children and adults, with researchers proposing that they might do so through a pathway of persistence, as opposed to the cognitive flexibility that positive emotions support (De Dreu et al., 2008; Nijstad et al., 2010). In other words, creativity benefits from an individual's ability to take different approaches and their willingness to put in effort, albeit along different pathways. Finally, evidence suggests that creativity is greater with higher emotional activation (e.g., angry, happy) than lower emotional activation (e.g., calm, relaxed, depressed) (De Dreu et al., 2008; Russ & Kaugars, 2001; Zeitlen et al., 2025). Converging with the affective-conative considerations of the CLOVER and at the level of the microexperience of the Visitor Experiencescape, museum engagement and learning are driven by situational emotions (see section 'Microexperience' in Chapter Three). As free-choice environments, negative emotions (e.g., frustration, confusion, uncertainty, low self-efficacy) experienced in museums tend to lead to disengagement, which could thwart the possibility of integration altogether (see section '(Mis)match' in Chapter Three). Taken together, children's creativity in the children's museum is, therefore, likely to benefit from high activation, positive emotions. Fortunately, and in part due to a reliance on voluntary visits, enjoyment is fundamental to museums (see Chapter Two, section 'What?') and children report enjoying and having fun during their visits to children's museum (e.g., Jensen, 1994).

Intrinsic motivation is another key creativity-supporting variable of the CLOVER's affective-conative states factor (e.g., Amabile, 1998; Amabile, 2003; see section 'Feeling' above). As a result of being an informal educational environment, children's museums are unassessed and non-evaluative (see Chapter One), which reduces extrinsic motivation and

instead supports intrinsically motivated engagement. In fact, “museums, without external means to compell a visitor’s attention, must rely almost exclusively on intrinsic rewards” (Csikszentmihalyi & Hemanson, 1995, p. 68). Moreover, “play, exploration and curiosity-spawned activities exemplify intrinsically motivated behaviors” (Ryan & Deci, 2020, p. 2). These are activities and behaviours inherent to the how children’s museums position their efforts, as reflected in the prevalence of “play”, “explore”, and “curiosity” in their mission statements (see Chapter Five, Kupiec, 2024). Creativity also benefits from opportunities to pursue personal interests. For example, Amabile and Gitomer (1984) found that children’s free-choice of materials and pre-existing, teacher-reported art activity *interest* were positively associated with more creative art collages, despite children’s equivalent engagement times. Children’s museums are not only designed to be developmentally appropriate and contextually relevant to children’s interests (Farmer, 1995; see section ‘What?’ in Chapter Two; see section ‘Where?’ in Chapter Two), but they are also free-choice environments, such that visitors are able to self-select engaging with exhibit themes and materials that resonate with them and their interests. Finally, this self-selection allows visitors to decide for themselves how long to spend at each exhibit, allowing creativity to unfold through engagement (see ‘Creativity is an Experience’ above), which can be captured by the microexperience of the Visitor Experiencescape (see section ‘Microexperience’ in Chapter Three).

As the third leaflet of the CLOVER, the environment must offer an appropriate degree of support and provide reasonable opportunity to be creative. Though the immediate social environment factor of the CLOVER would be primarily influenced by who is in an individual’s visiting group (see section ‘Family Visits’ below), children’s museums do offer a general social environment with creativity-supporting conditions (e.g., psychological safety by offering encouraging and non-evaluative spaces where visitors can experiment and make mistakes: see Chapter One; valuing creativity: see Chapter Five, Kupiec, 2024). However, as exhibits are designed areas, it is the children’s museum’s physical environment that offers more ways to be intentionally designed to support creativity. While child creativity can emerge in various forms and communicative manifestations (see section ‘Proposing and Defining a Sub-Construct: “Child Creativity”’ above), children are typically concrete with their creativity (see section ‘A Developmental Competency’ above) and, thus, benefit from being able to express their creativity “in material form” (Vygotsky, 1967/2004).

Beyond simply having materials, creativity unfolds through mutual (re)definition between individuals' shifting perspectives of their environments and the changing states of their material engagement (see section 'Creativity is an Experience' above; see section 'Spontaneity and Serendipity via Engagement, but Not Luck' above). As such, rather than specific defined props, children's creativity benefits from non-specific defined props, as these afford opportunities for more possibilities to be discovered, used, and implemented (Mellou, 1995). Additionally, research with adults suggests that manipulating tangible materials supports creative problem-solving (Vallée-Tourangeau et al., 2016). By providing plenty of different, easily accessible materials and resources that are brought to life by visitors' active participation and hands-on interaction (see section 'Where?' in Chapter Two), children's museums may offer an opportune environment for creativity. During the visit, reciprocal determinism and visitors' (inter)action with(in) the museum environment and its exhibits can support understandings of creativity and how it unfolds (see section 'Reciprocal Determinism' in Chapter Three; see section '(Inter)action With(in)' in Chapter Three).

Finally, evidence suggests that physical actions and embodied movement during engagement increase creativity in children and adults (Richard et al., 2021; Frith et al., 2020; Leung, 2012; Kirk & Lewis, 2017; see section 'Creativity Unfolds Over Time' above). As themed areas, children's museum exhibits include materials *and* space frames (see section 'Where?' in Chapter Two), and these are designed for how children behave (Lewin, 1989; see section 'Insufficiencies Pronounced in the Children's Museum' in Chapter Three). Thus, children are not only invited to interact with materials through hands-on engagement but they are also permitted the freedom to act and move within the space more broadly, increasing the potential for creativity in the children's museum environment.

As indicated by the Visitor Experiencescape (i.e., visitor portrait: see section 'Visitor Experiencescape: Visitor Portrait' in Chapter Three) and the CLOVER (i.e., thinking and feeling: see section 'Individual' above), a variable that supports one child's creativity during their children's museum experience may hinder or suppress it in another. For example, the level of environmental stimulation can differentially influence children's creativity depending on their selective attention skills (van Dijk et al., 2020). Children's museums provide a wide range of exhibit types, materials, and ways to participate in order to engage visitors and accommodate their individuality (see section 'Where?' in Chapter Two; see

section ‘Variety’ in Chapter Three). Therefore, already designing for a diverse audience (see section ‘Experience Design’ in Chapter Three), the children’s museum may be an appropriate place to accommodate and support a diversely creative audience.

Nurturing Children’s Creativity

Creativity is a Lifelong Competency (see Chapter Five, Kupiec, 2024). According to mission statement analysis, children’s museums prioritise learning and strive to go beyond supporting moments of creativity to also *nurturing* creativity (see Chapter Five, Kupiec, 2024). It is probable that creativity-related benefits of children’s museum visits would extend beyond the children’s museum setting, as a wealth of evidence suggests that museum conversations, play, learning, and new interests extend beyond the museum (Anderson et al., 2002; Briseño-Garzón et al., 2007b; Ellenbogen et al., 2004; Marcus et al., 2021; Taylor & Kervin, 2022). The stem of the CLOVER (see section ‘Incorporating Growth’ above) and the macroexperience of the Visitor Experiencescape (see section ‘Macroexperience’ in Chapter Three) allow for consideration of how the children’s museum may contribute to children’s capacity-building for future creativity.

A growth-oriented competency, creativity is experience-dependent and opportunity-linked (see section ‘Experience-Dependent and Opportunity-Linked’ above). Demonstrating how children’s museum visits can contribute to nurturing creativity in these ways, parents report visiting and valuing children’s museums because their children can do something new and different, as well as engage with materials unavailable at home (McInnes & Elpidoforou, 2018; Weiland, 2015). Further, they recognise that museum spaces designed for children offer both real-world and novel opportunities, report that their children prefer engaging with novel experiences, view this novelty as important for their children’s development, and appreciate that this supports their children in discovering new interests (Taylor & Kervin, 2022). Additionally, the flexibility of adapting to new, imaginary situations and conditions during games nurtures the development of creative skills (Vygotsky, 1926/1997), and children’s museums prioritise play (e.g., Luke et al., 2021; Luke & Windleharth, 2013; see Chapter Five, Kupiec, 2024).

It has already been argued that situationally-elicited positive emotions support creativity during children’s museum experiences (see section ‘Supporting Children’s Creativity’ above). However, according to Fredrickson’s (2001) broaden-and-build theory, positive emotions not only broaden immediate thought processes to be more open at a

particular time, such that creativity may become more accessible in that moment, but also in a way that supports individuals in building their personal resources for future engagements, including their psychological, social, *and* intellectual resources. In this way, the positive emotions experienced during museum visits can also nurture the development of the individual factors that contribute to creativity, or the thinking and feeling leaflets.

More than merely harnessing the situational benefits of positive affective-conative states to support creativity, Vygotsky (1926/1997) wrote that "the emotional aspect of personality has no lesser a value than all the other aspects, and constitutes a subject and a concern of education just as much as does the mind and the will" (p. 108). By providing positive experiences of creativity, children's museum visits are importantly able to contribute to nurturing the growth of the feeling leaflet during the critical period of creativity development, or when children are building their creative self-identity, self-beliefs, and self-efficacy (see section 'Critical Developmental Period in Childhood' above). In fact, through direct hands-on engagement, vicarious experiences of observing others sharing the space, creativity-encouraging social interactions, and positive emotional engagement, children's museums are able to offer all four principal sources of information to nurture the development of children's creative self-efficacy, which can, in turn, inform children's future engagements and experiences (Bandura, 1978a; see section 'Critical Developmental Period in Childhood' above). Finally, creative self-beliefs can crystalise over time (Beghetto, 2022), and evidence suggests that repeat museum visitors are more comfortable (see section 'Macroexperience' above in Chapter Three), including that children who have previously visited a museum may hold a more positive attitude towards the museum (e.g., as an exciting and happy place) (Piscitelli & Anderson, 2001). Therefore, it is essential to acknowledge that children's museums' contributions to creativity may change and compound over time.

Family Visits

As represented by the CLOVER, opportunities for creativity are about more than a well-designed physical environment; they are also sensitive to an individual's social environment. The psychological atmosphere shaped by the immediate social environment is crucial, as children need psychological safety to capitalise on opportunities for creativity; after all, "vulnerability is the birthplace of innovation, creativity, and change" (Brown, 2012, 5:48). Perhaps as a result of feeling more comfortable, children's development, capacity to

learn, and motivation benefit from interacting in established dyads when entering new spaces, or transcontextual dyads, such as that of children with their caregivers (Bronfenbrenner, 1979). Further supporting their creative engagements, compared to class visits, children have greater autonomy, choice, and enjoyment during family visits (see section 'A Focus on Family Visits' in Chapter Three).

Evidence suggests that when managers match work to employees' interests and skills, creative production increases (Amabile, 2003), and caregivers have an understanding of their children that can help them match their children's interests and abilities with museum exhibits and activities (see section 'Serving an Intermediate Role' in Chapter Three). Additionally, groups are more creative when they have a shared history of common knowledge and conventions (Sawyer, 2012; see section 'Group Creativity' above), and research has shown that adult-child collaborative creative problem solving in out-of-school contexts is supported through drawing upon shared knowledge and experiences (Knox et al., 2022). As evidence suggests that caregivers do draw upon their shared histories to support their children's learning during museum visits (see section 'Family Resources' in Chapter Three), family children's museum visits could be particularly supportive of children's creativity. Finally, the children's museum family visit meets the criteria for positive development and intrinsic motivation, according to self-determination theory: the children's museum is (1) a safe space for families to allow child-led activity (autonomy), (2) made up of exhibits pitched at the child's level and explored with caregiver guidance and encouragement (competence), and (3) values and prioritises the family visiting group learning together and connecting (relatedness) (Ryan & Deci, 2020).

While family visits are promising for enhancing children's creativity, how these engagements unfold could be further influenced by the interaction styles within family visiting groups. For instance, during family visits to a natural history museum, children from child-led dyads expressed more intrinsic motivation during post-exhibit reflections than children from caregiver-led dyads (Weisberg et al., 2023). During children's museum visits, most parents report following their children's interests and preferences (Crowley et al., 2001; Gallagher & Dockser, 1987), and some evidence suggests that they do not often refocus their children (Dooley & Welch, 2014). On the other hand, children report feeling rushed during museum visits (Piscitelli & Anderson, 2001), and a larger body of work has found that some parents do prematurely rush their children from one exhibit to the next

(e.g., Lewin, 1989; Wood & Wolf, 2010). An *experience* that necessitates time for engagement (see section 'Creativity is an Experience' above), rushing children might stifle their creativity in the moment and/or signal that creativity is not important, negatively impacting the development of creative self-identity, self-beliefs, and self-efficacy. In fact, removing constraints that could hinder children's engagement, such as time pressure, might be particularly beneficial for children's creativity (see section 'Spontaneity and Serendipity via Engagement, but Not Luck' above).

Emphasising (inter)action with(in) an environment, such as that which occurs during museum experiences (see section '(Inter)action With(in)' in Chapter Three), evidence from families engaging in library and museum engineering programmes suggests that creativity emerges, at times serendipitously, through both material-focused actions *and* socially collaborative verbal and non-verbal interactions, including within family groups, across families, and with researchers serving as programme facilitators (Kim & Zimmerman, 2020; Kim & Zimmerman, 2023). This work additionally suggests that the type and degree of caregiver involvement influence the level of creativity, whereby more collaborative and equal parent-child ideation and engagement supports greater creativity, while too much parent involvement results in lower ratings of novelty. Therefore, it is crucial that work exploring creativity during children's museum family visits focuses effort on better understanding *family* engagement, including caregivers' interactions and the significant social role they play during their children's engagement with physical environmental opportunities.

Creativity is influenced by a multitude of variables from both the social and physical environments. A particular environment, children's museums are especially poised to be holistically creativity-enhancing. However, environmental factors—social and physical—can help *or* hinder creativity, such that it is not only the absence of inhibitors but also the implementation and application of helpers that enhance children's creativity. Thus, while children's museums have potential for supporting and nurturing children's creativity, a better understanding of creativity during family visits, including the experience design and museum practice decisions that could enhance it, holds even greater potential to make a meaningful impact on children's lives.

Lastly, and of critical relevance in working towards better understandings in the field of creativity, as well as their applications to children's museum design and practices, much

of the work on group creativity (see section 'Group Creativity' above) has explored organizational and workplace creativity. Less is known about creativity during intergenerational group activities. Due to the growth-orientation of creativity and the sub-construct of child creativity, unlike being able to model a family visiting group with a single Visitor Experiencescape in addition to modelling individuals' experiences separately (see section 'Experiencescape: Visitor Portrait' in Chapter Three), it is essential to note that each individual participating in group creativity would maintain their own CLOVER and creative experience, one which functions reciprocally with others' creative experiences and often unfolds through improvisation. This warrants future attention and investigation, and the resulting insights about how CLOVERs function together could be of notable interest, particularly given the differently weighted CLOVERs that caregivers and children would experience during intergenerational family museum visits (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components' above).

Conclusion

Creativity is for everyone, applicable to every domain, expressed in a myriad of ways, and, perhaps most importantly, malleable, which necessitates a growth-oriented approach. The limited knowledge surrounding *children's* creativity may be a result of how creativity has been conceptualised and defined. However, creativity develops with use, such that it is important to understand how children's creativity unfolds and have the shared language to discuss and recognise it when it does. In response, this chapter has synthesised current conceptualisations and presented a new model, the CLOVER, which builds on, rather than discounts, existing conceptualisations. Additionally, explaining how the components of the CLOVER function as a dynamic system of interaction between an individual (i.e., their thinking and feeling) and their environment, creativity has been described as an experience. Through these discussions, it was illustrated how the CLOVER could support the field of creativity in moving towards bridging gaps, clarifying discrepancies, and unifying debates for a more holistic understanding of creativity, including one that accounts for children. This chapter then explored concerns of the current approaches taken across the field in defining creativity, including their subjectivities and blurred boundaries, which may be particularly detrimental to the study of children's creativity. A definition for child creativity as a sub-construct of creativity was proposed. By opening the door to a deeper and more complete understanding of *child creativity*, these contributions could help researchers investigate the

conditions, situations, and contexts that support children's creativity, as well as identify and develop practices to nurture its growth. Family visits to children's museums were identified as a promising creativity-enhancing context, and it was argued how children's museums might both support and nurture children's creativity. However, more needs to be known about how to thoughtfully design the children's museum to optimally fulfil its potential as an appropriate and holistic setting for maximising creativity during family visits.

Chapter 7

Curating for Creativity: Exploring Practices at American Children's Museums

Introduction

Mission statement analysis has identified the Lifelong Competency of creativity as a priority for American children's museums, both as a goal and as a mediator to support learning (see Chapter Five, Kupiec, 2024). According to the American Alliance of Museums, "activities of the museum should support, directly or indirectly, the mission" (n.d.-b, para. 1), but evidence suggests that a gap between mission statements and practice may exist in informal educational environments (e.g., zoos: Maynard et al., 2020). While important to their intended practice, little is known about children's museums' creativity-related implemented practice, and, in turn, little is known about how to effectively enhance children's creativity during family visits.

Understanding and Supporting Children's Creativity

There is a lack of consensus on how to define creativity (e.g., Plucker et al., 2004; see section 'Approaches to Defining Creativity From Across the Field' in Chapter Six). Moreover, several common myths, such as that creativity is only for some people, primarily for art-related activities, and not malleable (Robinson, 2009), may contribute to limiting beliefs. Because implicit definitions shape how individuals view their own and others' creativity (e.g., Kaufman & Baer, 2004; see section 'A Limited "Standard Definition"' in Chapter Six), such misunderstandings could result in children's creativity being left unacknowledged and undersupported.

A wealth of evidence has identified a wide range of circumstantial conditions that can influence children's creativity. However, the majority of this research and its ensuing recommendations have focused on the formal educational environment of the school and children's creativity in the classroom. Nonetheless, reviews across this body of work (Amabile, 1996; Beghetto & Kaufman, 2014; Davies et al., 2013; Davies et al., 2014; Hennessey & Amabile, 1987; Richardson & Mishra, 2018; Runco, 2014; Sawyer, 2012; Sternberg & Williams, 1996) suggest that children's creativity can be *supported* by aspects of:

- their physical environment (e.g., the availability of materials, a variety and range of materials, allows for the flexible use of space, multiple spaces to work are available

with some separation, examples of student work are present, allows physical movement),

- their social environment (e.g., psychological safety, creativity is modelled and valued, open-ended questions to extend children's thinking (e.g., conditional or counterfactual questions, such as "could be…", "what if…", "how about…", "then what…"), teachers develop their own creativity, mistakes are accepted, new ideas are encouraged and given time, alternative or strange ideas are accepted, ambiguity is tolerated, praise and supportive feedback are given for effort and unique ideas, taking sensible risks is permitted, appropriate noise and mess are allowed, positive teacher-student relationships are cultivated, teachers model intrinsic motivation, an informal atmosphere, humour),
- targeted child support through the social environment (e.g., explicit prompts to be creative, encouraging pride and self-determination, helping students find and pursue their interests, helping students build confidence and self-efficacy in their creative abilities, encouraging students to share their creativity, encouraging students to question assumptions, helping students manage failure, helping students resist peer pressure and conformity, encouraging alternative perspective-taking),
- the pedagogical approach (e.g., play and playful or games-based activities, open-ended tasks or activities (e.g., exploration, experimentation, discovery, trial-and-error), less prescriptive plans and more flexible use of time, offering some unstructured time, allowing learner autonomy and independence, focusing on process over outcome, connecting to children's interests, relevance to real life contexts, ideas and domains are cross-fertilised and/or analogies are drawn, providing appropriate challenge),
- child-environment fit (e.g., providing individual instruction; recognising and providing opportunities for individual differences, interests, passions, needs, and styles), and
- child engagement (e.g., positive affective-conative states (e.g., enjoyment, interest, curiosity, intrinsic motivation), active participation, student-led or

student-centred, allowing time and encouraging task commitment, providing choice and autonomy).

Additionally, findings show that creativity can be supported through opportunities that are balanced (e.g., offering structure *and* freedom) and those that engage multiple individuals together in group creativity (e.g., students are provided opportunities for peer collaboration, teachers act collaboratively as co-learners or play participants). Finally, this literature suggests that rewards, competition or comparison, expected evaluation, surveillance or a watchful audience, stress and pressure, time constraints, and restricted choice can *hinder* creativity.

While literature review evidence suggests that teachers might have incomplete, limited, or uninformed understandings of creativity (Mullet et al., 2016), other research suggests that teachers' beliefs do align with and reflect the body of evidence on creativity, but that their classroom practices often do not (e.g., Cheung, 2012). Reasons that creativity-enhancing practices may be under-implemented in the classroom include a lack of training and preparedness, a lack of time, limited opportunities within curriculum specifications, a focus on teaching to the test, and a lack of creativity-related organisational support or school ethos (Al-Abdali & Al-Balushi, 2016; Davies et al., 2013; Harris & de Bruin, 2018).

Children's museums are distinct from schools (see section 'The Children's Museum as a Unique Setting' in Chapter Two) and, as one type of informal educational environment, free from many of the pressures that teachers report facing (see Chapter One). As such, translating what is known about creativity from classroom-based research to the context of children's museums is not straightforward, and may even be counterproductive. Instead, and in order to understand and effectively design for creativity during children's museum visits, it is essential to examine children's museum professionals' creativity beliefs, institutional ethos, the creativity-related practices implemented in children's museums, and their influences on visitors' experiences.

A Unique Experience: The Children's Museum Context

Play is at the core of the children's museum experience and, thus, central to visitor engagement (see section 'Insufficiencies Pronounced in the Children's Museum' in Chapter Three; see Chapter Five, Kupiec, 2024). Moreover, children's museum professionals believe that play is an important learning process in their spaces (e.g., Luke et al., 2021). Promising to children's museums as informal educational environments, evidence suggests that both

guided and unguided parent-child play result in more positive affect and greater creativity than formal learning activities (Eason & Ramani, 2020).

A wealth of evidence suggests that certain *types* of play may enhance children's creativity more effectively than others (e.g., fantasy: Hennessey & Amabile, 1987; make-believe: Dansky, 1980; realistic role-play: Mullineaux & Dilalla, 2009; socio-dramatic pretend play: Robson, 2014). Furthermore, it might be the *adult's role* during play that supports creativity (Lillard et al., 2013; Mellou, 1995; Pellegrini & Greene, 1980; Tok, 2022). In fact, guided play "is likely to be a springboard for creativity" (Zosh et al., 2017, p. 172). Midway between free play and didactic teaching (Weisberg et al., 2013), guided play encompasses how adults set up a child's physical environment *and* how they support child-led and child-directed playful engagements within these spaces (Toub et al., 2016; Weisberg et al., 2013). Through their intentionally designed and facilitated exhibits for children and their caregivers to (inter)act with(in) together (see Chapter Two; see Chapter Three), children's museums have great potential to enhance children's creativity during family visits (see section 'Children's Creativity in Context' in Chapter Six). As little work to date has investigated creativity in children's museums, it would be valuable to better understand how to fulfil this potential.

The following sections explore how museum design and practices influence families' experiences at children's museums in relation to the factors of the Visitor Experiencescape (see section 'Modelling the Experiential Overlap: Factors, Form, and Function' in Chapter Three): the physical environment, the social situation, and the visitor portrait. These are each especially relevant for the study of creativity, as creativity is also a multi-componential construct that depends on factors of the individual and their social and physical environments (see section 'Three Leaflets: Thinking, Feeling, and the Environment' in Chapter Six).

The Physical Environment

Museum exhibits are intentionally designed areas (see section 'Where?' in Chapter Two), such that museum professionals' experience design decisions set the stage for visitors to (inter)act with(in) (see section 'Experience Design' in Chapter Three). Although children do not always engage with exhibits how they are intended (see section '(Mis)alignment' in Chapter Three), their play and interactions are usually sparked by and related to exhibit themes (Hein, 1998). Moreover, because children's museum exhibit materials are brought

to life by and given meaning through hands-on engagement (see section 'Where?' in Chapter Two), the materials that fill exhibits and how they are presented can greatly affect visitors' experiences. In fact, greater exhibit interactivity elicits higher levels of child engagement and pretend play (Caporaso et al., 2022). In addition to tangible elements and materials, factors that contribute to the ambiance and aesthetics (e.g., lighting, colour, sound) (e.g., Leinhardt & Knutson, 2004), as well as the general museum layout, including the "spaces-in-between" exhibits (e.g., Hackett et al., 2018), are important determinants of museum experiences (see section 'Visitor Experiencescape: Physical Environment' in Chapter Three).

The physical environment can also implicitly signal to caregivers how they can or should participate during family museum visits. For instance, museum seating increases exhibit visit time (Hein, 1998), while *movable* seating increases parental engagement with young children during children's museum visits (Gaskins, 2008). Of growing interest, technology in museums can increase child motivation, support parent scaffolding, and encourage family engagement (de La Ville et al., 2021; Price et al., 2022). However, digital-only children's museum exhibits are not as effective at engaging family visitors as those offering mixed reality (Vishkaie et al., 2021). While it is clear that the design of museums' physical environments significantly influences visitors' experiences, understanding how children's museum design decisions impact children's creativity in particular would be instrumental in optimising the environment to maximise creativity during family visits.

The Social Situation

An individual's museum experience is influenced by who they visit with and by their social interactions throughout their visit, including those with other visitors, both within and outside of their visiting group, and with museum facilitators (see section 'Visitor Experiencescape: Social Situation' in Chapter Three). Family visiting groups are common to children's museums, and caregivers are well-positioned to step into scaffolding and mediating roles for their children (see section 'Museum Behaviours' in Chapter Three). In fact, adults visiting museums with children are not only motivated to visit *for* their children (e.g., Hooper-Greenhill, 1994), but also to support their children's learning during the visit (Phelan et al., 2020). Nonetheless, adult-child engagement differs between exhibits and family group visitor portraits (e.g., child age, child-to-adult ratio) (e.g., Braswell, 2012).

Catering to children and their caregivers (see section 'What?' in Chapter Two), children's museums are intended for intergenerational visiting groups (Farmer, 1995; Mayfield, 2005). Evidence suggests that the *quality* of caregiver-child interactions during children's museum exhibit play is more meaningful than the quantity (e.g., Sobel et al., 2021). Though parents report that they view child-intended museum spaces as a place to be present with their children (Taylor & Kervin, 2022) and enjoy child-directed play and activities together, observations show that they instead tend to supervise, instruct, and discipline (Downey et al., 2010). In fact, caregivers might over-manage the rules, restricting their children's engagement (Archer et al., 2016; Carpenter, 2018).

Museum facilitators also play a crucial role in supporting museum engagement. For example, compared to visiting group-only interactions, learning conversations are more likely when "stimulated" by an interpreter, and visitors' conversations tend to be more content-focused and longer with museum facilitators than without (Kopczak et al., 2015; Rosenthal & Blankman-Hetrick, 2002). As an individual's social and psychological environments might have greater influence on their creativity than their physical environment does (Abdulla & Cramond, 2017; Amabile, 2003), it is especially important to understand how the dynamic social interactions that unfold within children's museums affect children's creativity, as well as how to best support these interactions during family visits.

The Visitor Portrait

Community and Inclusion

Museums are a place for the public and, thus, need to be designed to provide for a diverse audience (Falk et al., 1986; Hooper-Greenhill, 1994). However, museum visitation depends, in part, on family practice, and those from nondominant communities, low socioeconomic status households, and with a lower level of educational attainment are less likely to visit museums (e.g., Hood, 1983/2007; Hooper-Greenhill, 1994; Moussouri, 2024; Tenenbaum & Callanan, 2008; see section 'Who?' in Chapter Two; see section 'Tension' in Chapter Three). When they do visit, families who are more distant from the typical museum visitor feel more "disorientation" and "discomfort" (Archer et al., 2016; Weiland, 2015). Moreover, museum practices can problematically reinforce the perception held by low-income and minority ethnic groups that the space is "not for us" (Dawson, 2014) (see section 'Who?' in Chapter Two; see section '(Mis)match' in Chapter Three). Furthermore,

while parents from different socio-cultural backgrounds share some beliefs about child museum learning (Briseño-Garzón & Anderson, 2012; Weiland, 2015), they have different views on the purposes and expectations of museum visits, museum interactions and behaviours, and museum learning (Fasoli, 2014; Gaskins, 2008; Wang et al., 2019) (see section 'Equity' in Chapter Three). Beyond sociodemographic factors, *every* visitor is unique; the impact of any visit varies with a multitude of visitor portrait characteristics (e.g., prior experience, prior knowledge, values, interests, motivations) (e.g., Falk, 2004; Falk et al., 1998; Hooper-Greenhill, 2004; Leinhardt & Knutson, 2004; see section 'Visitor Experiencescape: Visitor Portrait' in Chapter Three). For instance, parents report that it is the inclusion of *their* child's learning style that helps their child enjoy and learn from their museum visit (Haas, 1996).

Inclusive design encompasses not only the physical environment (e.g., exhibit offerings), but also the psychological and emotional (e.g., sense of: orientation, belonging, comfort) (Holmes, 2018). Thus, within and across children's museum exhibits, considerations must be made to provide opportunities and support for individuals of various abilities, interests, ages, play style preferences, social groupings, levels of museum familiarity, cultures, and adult roles (e.g., Gaskins, 2008; Mayfield, 2005; see section 'Experience Design' in Chapter Three). This is essential for the present work, as creativity is also significantly influenced by a wide variety of individual and environmental factors (see section 'Individual' in Chapter Six).

Museum Experience and Familiarity

When visitors step into a museum, they may be uncertain about what to do (Csikszentmihalyi & Hemanson, 1995) and how to act (Koran & Koran, 1986). Museum familiarity can reduce these uncertainties (see section 'Who?' in Chapter Two; see section 'Visitor Experiencescape: Visitor Portrait' in Chapter Three; see section 'Macroexperience' in Chapter Three; see section '(Mis)match Changing with Museum Visiting Experience and Habits' in Chapter Three). Similar to how children have to learn how to learn in the school classroom or learn how to read before reading to learn, visitors need to learn how to learn in museums. Unsurprisingly, then, evidence suggests that prior visitation changes children's beliefs, attitudes, and behaviours (Carter, 2017; Piscitelli & Anderson, 2001). Moreover, because initial visits can overwhelm children (Carter, 2017), they might be best used to familiarise children with the museum and subsequent visits for learning (Rapp, 2005).

Repeat children's museum visits may be especially beneficial to creativity. For instance, visitors familiar with a museum engage with fewer exhibits, stay at them longer, and preference those that are interactive and aligned with personal interests (Heuken et al., 2021), engagement elements that support creativity.

Creativity-Specific Visitor Support

In addition to museum familiarity built from prior experiences, orientation efforts can alleviate museum visit uncertainties and increase comfort, engagement, and learning (Bitgood, 1994; Hein, 1998; Hood, 1983/2007; Hooper-Greenhill, 1994; Loomis, 1987). Without effective communication with and support for visitors, the children's museum's full potential risks remaining misunderstood and inaccessible (Lewin, 1989). Moreover, meta-analytic findings suggest that instructions explicitly indicating that participants should be creative significantly increase their creative task performance (Said-Metwaly et al., 2020). Therefore, by explicitly framing the museum visit in terms of creativity, visitors might be more likely to engage creatively.

Evaluation

Despite a field moving beyond easily measurable output variables (e.g., visitor demographics, attendance, engagement time), outcomes and impacts, including creativity, remain understudied during museum visits. One reason for this could be the lack of contextually sensitive assessment tools. In fact, during the development of an observational tool to examine Lifelong Competencies at a children's museum, creativity items needed to be dropped after piloting (Braswell, 2016). However, even if creativity were to be measured in the children's museum, findings might not be applied to design and practice for two key reasons. Firstly, within a single institution, "evaluation data may simply not be as important as the influence of an outside source, such as a trustee board or a municipal budget authority" (Loomis, 1987, p. 12). For instance, and in relation to institutional implementation constraints, Weiland (2015) reflects that, "it is interesting to note the results of this study were shared with the board members of the science center, but little action was taken, in part because they stated that it would be difficult to find bilingual staff" (p. 103). Secondly, across institutions, museum practitioners report difficulty accessing results of evaluation conducted in other museums (Adams, 2012; Luke & Windleharth, 2013). Understanding whether children's museum professionals are conducting creativity-specific evaluation and how such findings are used and/or shared could support all

children's museums in more successfully identifying creativity, as well as developing and implementing creativity-enhancing design and practices.

Research Aims

Emerging evidence suggests that museum visits may enhance children's creativity (Gong et al., 2020; Gregoriou, 2019), but creativity benefits from intentional support (Amabile, 1998). Despite an institutional focus on creativity (see Chapter Five, Kupiec, 2024), evidence suggests that museums might not be doing enough to define and evaluate their most central priorities (e.g., play: Luke et al., 2021). Furthermore, although a wealth of research has explored how to effectively enhance creativity, this has been primarily limited to children's classrooms (see section 'Understanding and Supporting Children's Creativity in Context' above) and adults' workplace and organisational settings (e.g., Amabile, 2003; Amabile et al., 1996; Amabile & Pratt, 2016; Ekvall & Ryhammar, 1999; Hunter et al., 2007; Isaksen, 2023; Mayfield & Mayfield, 2010).

Though creativity is a situationally sensitive and contextually dependent construct (see Chapter Six) and museums are intentionally designed (see section 'Where?' in Chapter Two), there is limited evidence or guidance on design and practices that enhance children's creativity in children's museums. Moreover, while nearly all children's museums report conducting evaluation or research, few collect data from museum staff (Luke & Windleharth, 2013). However, the staff is integral in setting the stage for and facilitating visitors' experiences (see section 'Experience Design' in Chapter Three; see section 'Museum Practice' in Chapter Three), such that it would be beneficial to explore how children's museum professionals engage with and reflect on museum experience design and practices, including in relation to creativity. Through semi-structured walking interviews with museum professionals, this study aims to explore children's museums' implemented practice by answering the following research questions:

RQ5: What do children's museum professionals believe makes the children's museum a unique place?

RQ6: (How) Do children's museum professionals define child creativity?

RQ7: (How) Is children's creativity supported and/or hindered at children's museums?

RQ8: (How) Do children's museum professionals identify and/or measure child creativity?

Methods

For a detailed explanation of the methods for Study 2 that have been abbreviated here as part of the Integrated Thesis format, see Chapter Four, section 'Study 2: Implemented Practice'.

Participants

Stratified purposive sampling ensured representation of children's museums across several key variables: funding and size, geographic region in the United States, and whether creativity appears in a museum's mission statement. In total, the participant group was made up of 12 museum professionals from six American children's museums. Each was employed by their institution for at least one year. (see Table 4.1)

Data Generation

A semi-structured interview was conducted individually with each participant at the children's museum they worked at and audio-recorded. The thematic interview schedule (see Appendix B) included information about the participant, the uniqueness and benefits of children's museums, defining child creativity, creativity's value and place in the children's museum, how central creativity is institutionally, how exhibit design features and practices support and/or hinder creativity, how visitors express creativity, and whether the children's museum conducts creativity-focused evaluation. Though participants occasionally spoke about other types of visits (e.g., field trips, camps), the interviews focused on family visits.

Interviews consisted of two components. The first was stationary and the second was a walking interview led by the participant through the museum. While topics arose organically across these components, the stationary portion generally focused on conceptual and less exhibit-specific topics, such as the uniqueness of children's museums, definitions of creativity, and creativity's value and place in the children's museum. On the other hand, the walking component largely focused on the museum exhibits, including design approaches and materials, museum practices, visitor engagement and play, and how various features and decisions support and/or hinder creativity.

Data Analysis

Audio files were carefully transcribed and analysed in NVivo (QSR International Pty Ltd., 2018) with thematic analysis, inspired by Braun and Clarke (2006, 2019). After thorough data familiarisation and initial note-taking, several rounds of coding were completed. Coded excerpts varied in length and could be assigned multiple codes to ensure

that meaning and context were retained, so as not to lose important insights. Aspects of both theoretical and inductive thematic analysis were used (Braun & Clarke, 2006). For example, structured coding was applied to identify predefined elements from the data (e.g., child creativity definitions, museum evaluation techniques). Within each of these topics, the data was then inductively coded to develop a more nuanced understanding that emerged through the coding process. In addition, open coding was inductively applied to the full data set to build thorough understandings, to analyse less defined aspects of the interviews (e.g., exhibit features, factors that support and hinder child creativity), and to answer the more exploratory research questions.

Due to the nature of walking interviews, the data generated sometimes referred to specific exhibit components without verbally describing them. Consequently, latent reflexive coding was used to go beyond the semantic level of the data, drawing on the researcher's memory to interpret and contextualise these references. For memory support, photos on museum webpages and those that individuals had publicly uploaded to Google were viewed as needed.

The first round of coding generated and applied initial codes, and a second round ensured that all codes generated from later transcripts had been coded for across the entire set of interviews. Next, these codes were reflected on to construct initial themes, and the codes were thematically grouped. The entire dataset was revisited to focus on one theme at a time. During this process, some codes were merged, others were re-coded into more specific codes for rich understanding, and others were moved to different themes with a better fit. The coding framework was exported from NVivo and refined. Clear names for themes, sub-themes, and codes were generated. See Appendix E for the coding framework developed through this process. Finally, differences were explored within and between participants and within and across institutions.

Findings

The Children's Museum

Children's museum professionals view children's museums as beneficially unique from "everyday life", particularly contrasting them to other explicitly learning-oriented places (i.e., schools and different museum types) but also, to a lesser extent, home and playgrounds. For example, Participant 0401 recounted "as I was standing here one day, there was a mom who said to the child, 'I I can't believe you can do that.' They were walking

up and th- down the stairs. And she said, 'I just told your pediatrician you can't do that.' And so it was that whole thing about milestones, the way we think about those developmental stages for kids, that when you put your child into an environment that neither of you are familiar with, they will do surprising things."

According to museum professionals, aspects making children's museums unique are that they offer play-based, hands-on, and exploratory engagement; provide opportunities for open-ended and nontraditional learning; serve as a "community hub" (see section 'Community' below); are fun; are explicitly designed *for children*, including how they learn and their size; expose children to what they might not encounter elsewhere (e.g., new concepts, ideas, materials); allow children to use real tools; offer a safe place to learn; permit visitors to work at their own pace; impose few rules or expectations; and provide staff facilitation. It was important to participants that what is experienced in children's museums not only reflects children's lives outside of the museum, but also that these experiences extend beyond museum walls. This included beliefs that children's museum visits provide a lifelong foundation by offering visitors an introduction to ideas and skills, allowing children to explore various potential careers, and serving as a seed of inspiration. At times, museum visitors share these personal impacts with museum professionals.

Several participants emphasised that while they do communicate with other children's museums and share some goals, practices, and exhibit types, they are also each distinct; for example, by focusing on specific themes or developing exhibits that reflect their own local community.

The target age range of children's museums varied. The smallest children's museum was intended for children aged 0–6 years, while larger children's museums were reported to serve children up to 8-, 10-, or 12-years-old, with one participant even reporting an upper target age of 14 years. However, a few participants stated that engagement primarily began with toddlers, and while specific programming aimed to reach children above 10-years-old, the physical areas of the exhibits had a lower "sweet spot" of engagement. Each museum was undergoing efforts to better serve additional audiences (e.g., age, neurodivergence, geographical location). The leading form of expansion was in creating new spaces and/or programmes, and in using these to extend the children's museum's targeted audience age range upwards.

Community

Visitor diversity is important to children's museum professionals. Half of the participants discussed local collaborations and visitors coming together across differences as a defining benefit of children's museums as a "community hub", with one participant stating that the children's museum fills a community need. While some children's museums successfully attract visitors that represent the diversity of their communities, others have greater difficulty. One primary reason for this could be that the misconception of what a children's museum is can lead to the perception of "oh, museum, that's not for me" [Participant 0202]. Museum professionals are not only aware of and concerned about these gaps, but they also genuinely want to close them. For example, Participant 0602 shared "we work hard to make sure that kind of the full diversity of our community is playing here every day and that our staff represents the full diversity of our community, so people feel welcome, valued, and represented." Despite reporting success that visitors represented the diversity of their community, this participant also noted that "our staff, we could do more."

It is significant for children's museum professionals that their museum provides exhibits and activities that are accessible and inclusive for a diverse audience (e.g., socioeconomic status, race, mobility, neurodivergence), such that all visitors can play, socialise, and feel a sense of belonging. In some cases, this was accomplished by providing additional offerings that explicitly support diverse needs, such as sensory hours and respite rooms. In others, inclusion efforts were supported implicitly through exhibit design. Speaking to this importance, Participant 0601 shared at one exhibit "one of the things that we did really right here was this sort of collaborative play. Like I wish we could do this in every exhibit where the kids kind of spontaneously come together." Beyond children, the community value for caregivers was also acknowledged, such as "and then you can see it also functions as a nice space for adults. Especially adults who maybe don't have other adults around all the time. It's been a nice bonding space for people to meet" [Participant 0401].

Children's museum spaces often reflect their local community, such as through displaying children's work in the space; partnering with and representing local individuals, organisations, and community interests, including to inform exhibit themes; and repurposing local spaces (e.g., historical buildings) and materials. Not only do children's museums work to reflect their own community, but they also do outreach *into* their

communities. A main impetus for this was reported as “breaking barriers”, particularly because efforts to lower the cost burden, such as participation in the Museums for All programme, are only partially successful at reducing sociodemographic attendance gaps. A significant topic spontaneously emerged at two different children’s museums about the importance of engaging with nondominant communities, and for museums to think beyond their own walls in doing this, as conveyed here:

> Participant 0401
>
> Whether it's they don't feel welcome here, they don't feel welcome in [city], whether it's a language barrier, but there's all kinds of things that could be a part of that.
>
> Interviewer
>
> Right.
>
> Participant 0401
>
> So we're working more deliberately with different community groups. Uh. Because we know that the best way to form a relationship is through a relationship people already have.
>
> Interviewer
>
> Yep.
>
> Participant 0401
>
> And when we were just walking in going here's a free pass, come see us. Here's a free pass, come see us. That doesn't work. It was developing the relationships with the families in their areas and then bringing them as a group here. And then once we bring 'em as a group here, they understand.

Creativity

Children’s museum professionals understand that everyone can be creative, and that each person has their own areas and ways of engaging with and expressing creativity. Defining creativity was difficult, and answers varied substantially. This was acknowledged by participants themselves: “Um. Ooh. That's a hard question” [Participant 0503] and “I'm sure everyone you ask is gonna give you a different answer” [Participant 0301]. Over half of the participants relied on similar constructs (i.e., imagination, discovery, exploration) and examples or anecdotes to support their definitions. Most commonly, child creativity was described as a process that is condition-dependent (e.g., having freedom, being hands-on,

having a variety of materials), domain-general, and characterised by new perspectives, approaches, or ideas. It was less frequently described as problem solving, unique to the individual, skill-based (e.g., divergent thinking, building on existing skills), uninhibited, based in play, divergent thinking, lifelong, spontaneous, related to trying new things, an approach, joyful, and simply the act of "being creative". Widely understood as applicable to many domains and expressed in various ways, one participant notably viewed creativity as more specific to art.

Three participants expressed the belief that creativity comes naturally to children. One participant believed that creativity is developmental, such that child and adult creativity have both similarities and differences because the process never ends but experience builds. Another three participants expressed that child and adult creativity are different, such as child creativity being more uninhibited. One participant said that child and adult creativity are the same.

Participants overwhelmingly reported that their role at the children's museum was not only to support moments or episodes of creativity during the visit, but to nurture it for a lifetime.

While learning was mentioned throughout the interviews, not all participants discussed creativity's role in learning. When asked, they agreed that creativity is a way of learning and an avenue for the future application of learned skills (e.g., during problem solving), but they rarely elaborated on a link between creativity and learning.

Levels of Creativity-Related Influence

Despite being difficult to define, each of the participants had their own implicit definition and understanding of the essence of creativity, allowing them to discuss the exhibits and visitors' experiences in relation to engagement and creativity. Five distinct themes that influence engagement and creativity were generated from the data, reflecting physical, social, and personal factors. Importantly, these factors exist at, and exert their influence from, various degrees of proximity to the visit experience and, thus, the child.

Exhibit

There were two distinct types of exhibits, both of which can elicit creativity: (1) "only at" exhibits, which offer unique opportunities from what is available at home, and (2) exhibits with familiar themes and/or materials, but which are offered in a novel way or in a larger quantity. For example, half of the museums not only had Legos but also a *wall* for

building with them in a way children generally do not have access to in other settings. All museums had exhibits closely related to real-life experiences. For instance, play kitchens were often discussed as familiar but sized for children, such that children experience less engagement obstacles than they would otherwise and can act out familiar adult roles in their own ways and on their own terms.

Each children's museum offers a variety of exhibits with diverse themes and engagement opportunities to cater to different individual interests, learning styles, and play preferences. However, during the walking tour, several participants expressed that art and/or building/making exhibits are where creativity most occurs. There was also an emphasis on balance across exhibits, such as offering busy and quiet spaces or larger and smaller exhibits. Larger museums were able to provide greater variety and stronger boundaries between exhibit areas.

Within exhibits, children's museums offer a variety of different materials for visitors to interact with and use. These also provide a range of sensory experiences. Exhibit interactivity was very important to participants, and materials support creativity by being open-ended and allowing for safe risk. The most frequently discussed materials across children's museum exhibits were costumes and loose, sometimes undefined, parts, supplies, and props. It was apparent that even for purpose-built materials, children frequently do not use these as they are intended. Though open-ended materials were highlighted as significant for creativity, it was also noted that being too generic sometimes hinders children's initiation and that having some concrete anchors in the materials implicitly supports children's engagement.

Half of the participants discussed opportunities for visitors to engage with messy materials at the children's museum; this was particularly in relation to art activities. Messiness was identified as significant for children's creativity. In fact, Participant 0401 shared their belief that "creation should be one big mess that comes back into order." Though exhibits and materials were at times characterised as fun, the connection between fun and creativity was not always recognised: "Not necessarily creativity. Just a fun exhibit" [Participant 0201].

Consideration is also given to *how* materials are presented, including being intuitive to engage with, and it was important to children's museum professionals that they keep

things “fresh” by providing new exhibits and materials on a regular basis. At times, children combine props and materials from different exhibits to extend their play.

The lack of technology throughout children’s museums was a significant point of discussion. It was not that children’s museum professionals are opposed to technology; rather, they are intentional with its application, using it primarily only when it enhances the experience in ways that could not be accomplished otherwise—and they embrace such applications excitedly. Reasons for otherwise avoiding technology included the importance of tactile play, technology’s ubiquitous presence in life outside the museum, that technology-driven exhibits break down, and that technology tends to offer more closed-ended engagements. Technology was rarely mentioned as something that supports creativity.

Exhibit design elements that were acknowledged as hindrances to creativity include materials with a prescribed use; placing examples in the exhibit space that prompt imitation, as opposed to inspiration; and when exhibits are narrowly goal-driven with little room for deviation, as opposed to goal-directed problem-solving exhibits with an open-ended process. Such practices were avoided or used sparingly. However, it is important to note that, while most participants specifically mentioned these factors as practices they do not often implement, one children’s museum was overwhelmingly goal-driven and relied on guided and closed-ended engagements more frequently than the others. Hindrances to creativity, challenge and competition were sparsely mentioned, and, across all of the sites, only in one exhibit was a reward offered.

In addition to how children interact with exhibit-specific materials, the physical environment’s interactivity, accessibility, aesthetics (e.g., colour, visual (over)stimulation), and ergonomics (e.g., child-sized) more broadly were found to contribute to children’s museum visits and creativity. For instance, the size and layout of the museum were mentioned as important for children’s creativity, including how they physically move and act within the space:

> Participant 0402
>
> I mean, they're just climbing on things and exploring, and I just love that that feel of just feel free within the space to you know, go wherever they want to go.
>
> Interviewer
>
> How much do you think the exploration ties into the creativity?

Participant 0402

It ties into their creativity because they just, I mean that. Being creativity is letting your mind kind of go in multiple directions and and it kind of branches off and and that's the way kids kind of wander around a space and they, that's like a physical representation of that, like um how they think, how they think within the space and just go onto the next thing and. You know, so the the the way they travel through the space is kind of creative. And as they explore an exhibit and

Interviewer

Yeah.

Participant 0402

Plus also a creative kind of physical manifestation.

In a few cases, the number of other visitors and crowding were reported to impact visitors' engagement, but not necessarily children's creativity. However, children's creativity is sometimes inspired by other visitors' play, such as when materials are left in a particular way and, for instance, "another kid builds off that. And you'd see some amazing creations come off of that" [Participant 0201].

Children's museums prioritise both learning and creativity; however, the potential of an exhibit for learning and creativity was at times a complicated relationship. For example, Participant 0201 stated at one exhibit "So uh not necessarily creativity, but we're trying to sneak in learning", at another "Lots of creativity goes on here. Lots of learning", and then described a third exhibit as "I don't know that I would describe this one as creativity as much as I would just say learning" before pulling back to wonder aloud "But then I think is creative, I mean is being creative, learning, you know? But there are some that just scream creativity".

Finally, while museum professionals recognised that children's engagement is situated, not determined, by exhibits (see section 'Child' below), they also believe that exhibit design features and materials are important: "You want them to have a prompt. You don't want just like a a blank slate for them to be, you know, you have to think of everything on your own" [Participant 0503]. This was especially significant for supporting creativity:

Participant 0202

Um kids are naturally curious and inquisitive. But there's not really a way to teach creativity per se. It's creating that fertile environment

Interviewer

Mmhmm.

Participant 0202

that helps them to develop it.

Institution

Children's museums have not defined creativity institutionally. Nonetheless, creativity *is* supported through institutional ethos, including in mission statements and in discussions during board meetings. However, one participant reported that their theme-focused mission statement might be an obstacle to offering a wider variety of opportunities for creativity.

While 11 participants reported discussing creativity regularly within their own staffs, only for three did it seem that creativity-related conversations were explicit and/or at the forefront of their practice. In fact, the starting point for exhibit planning varies widely, with only one participant saying that this includes creativity. Other considerations are learning goals, mission alignment, funding, safety, fun, community need, interest, and a particular play goal. Alongside these exhibit priorities, limited institutional resources (e.g., the number of facilitators, time, money) and being held responsible for safety constrain the scope of possibilities for design and practice, including influencing opportunities for creativity.

Partnerships emerged as significant for children's museums, and all of the children's museums engaged in partnerships. The first type of partnership was perceived to primarily *support* museum practice and creative experiences, including bringing in other cultural institutions, working with design companies and fabricators, hosting artists-in-residence, and engaging in dialogue with other children's museums. The second type of partnership appeared to be *restrictive* at times, such as children's museums partnering with corporate companies, higher education institutions, and foundations, all of whom, to an extent, decide exhibit themes, play types, and materials. A third type of partnership seemed to be *neutral* towards its potential impact on creativity, such as school partnerships and hosting field trips, therapists using the exhibit spaces, developing exhibits with community members and external organisations, and receiving grants and funding from the government and private individuals. Museum size impacted partnerships; for instance, only larger children's museums reported artist-in-residence programmes.

Staff

Throughout the interviews, participants made personal and familial reflections—it was evident that they care about what they do and how they can support visitors, including in creativity. On-the-floor staff facilitation plays a significant role in the children's museum experience and can support children's creativity. Facilitators engage visitors through conversations, guided discovery, open-ended exploration, and playing together. During these interactions, they offer open-ended scaffolds and prompts; ask children about their thinking, primarily with open-ended questions; and use museum materials. A few participants further specified that their facilitation practices prioritised meeting the child where they are, including in the interests they show; being light touch, such as receding after a brief supportive interaction; and offering guidance meant to prompt rather than do for the child.

While facilitation helps visitors engage more fully with exhibit materials, facilitators sometimes lead heavily guided activities. Too much restrictive and guided facilitation was described as an obstacle to children's creativity. Facilitation was reported to differ depending on the exhibit, the day and its visitors, and staff availability; further, though facilitators receive training, their skilfulness varies.

Crucially, facilitators do not just focus on child engagement. They also provide specific modelling and scaffolding for, and engagement with, caregivers. For example:

> Participant 0202
>
> There was a family that started here at baby classes. And, not that she didn't want to play with her child, but it was knowing how.
>
> Interviewer
>
> Right.
>
> Participant 0202
>
> And really it was our job to provide her with the tools on how to do that. So, we would run baby classes, and then of course she would play in the museum afterwards. And now that said child is six, and the difference in watching her come in from a timid, apprehensive mom
>
> Interviewer
>
> Mmhmm.
>
> Participant 0202

to completely on board.

Interviewer

Yeah.

Participant 0202

Is an awesome process.

While facilitators often support, prompt, and model for caregivers, several participants reported that they will not excessively intervene, such as "We're not gonna badger a parent. If a parent's gonna take over the experience, then we're gonna let 'em" [Participant 0401]. Moreover, despite facilitation for and appreciation of playfully engaged caregivers, participants also expressed great empathy for and understanding of less involved caregivers, and the museum's place in providing them a safe break.

In addition to facilitation directly impacting visitors' experiences, the staff's influence on creativity could also be felt but not seen. For example, at times acknowledging that they are not children themselves, the majority of participants unexpectedly discussed their own creativity as being an important factor in designing exhibit spaces for creativity; for example: "We try to stay creative amongst ourselves" [Participant 0201] and "We always try to like think of ways that we as staff can be creative" [Participant 0503].

Child

Children's engagement, including their creativity, is recognised as individually unique. For instance:

Participant 0602

I think everyone is creative. But I don't think. I think uh everyone is creative, but everyone's

Interviewer

Mmhmm.

Participant 0602

creativity looks different or plays out differently. Uh. And so. I think whatever form of creativity people

Interviewer

Mmhmm.

Participant 0602

um bring with them or uh makes them thrive, will come out as they play here.

Though many participants believe that children of all ages are creative at children's museums, age and developmental stage were reported to influence children's exhibit engagements and creative expressions. Other child factors that shape children's exhibit engagement and creativity include their personality, personal background and prior experiences, prior visitation or favourite exhibits, interests, preferred type of play (e.g., role-play versus building), mobility, and neurodivergence. One participant also shared that children on field trips tend to role-play longer because they are familiar with playing together.

Children experience different emotions during their visits. Although exhibit engagements were most often described as fun, enjoyable, and something that children loved, being fearful or afraid to make a mistake and/or break something was believed to hinder creativity. Child factors can interact with each other. For instance, a participant shared that the fear of failure more noticeably holds children back from being creative as they get older, but later shared that this fear can be counteracted by comfort developed through multiple visits.

Children's museums are for children, but they all still had some age divisions, primarily by separating off space for the very youngest visitors. Certain exhibits also tend to resonate with different ages. For example, at one museum, younger visitors tend to use the art studio, while older children the makerspace. Even when exhibits are used by everyone, the engagement within them changes, such as children going deeper as they get older and staff drawing upon different facilitation techniques in response to a child's age.

Children often engage in play (with a large emphasis on role-play), exploration, imagination, experimentation, problem solving, and discovery. It was widely recognised that children make the experience and must be given the autonomy to do so. For instance: "I think it's about empowering the child. And our acknowledgement of when a child feels really empowered in their environment. And um so. I- whether that's creativity or not, I don't know. But I think that that's a lot of, you know, we're just really child-centered here" [Participant 0401]. Thus, while design can set the stage to encourage engagement (see section 'Exhibit' above) and participants discussed their spaces as inspirational, interesting, motivating, and aspirational, they also acknowledged that children do not always use materials as intended and that children's own behaviours greatly support their experiences,

including their creativity. For example: “We can provide immersive environments and sort of set the stage. Uh but we're not writing the script” [Participant 0601].

Caregiver

Regardless of other factors, caregivers have a significant influence on children’s creativity during children’s museum family visits, as discussed here:

> Participant 0302
>
> You could be creative at at any exhibit in any way. It just depends on how wide your imagination is.
>
> Interviewer
>
> Mmhmm.
>
> Participant 0302
>
> And ho- what your parents’ll let ya do.

Caregivers display a variety of behaviours throughout the museum, and their engagement and interactions can be influenced by a wide range of factors. These include caregivers’ perceived level of physical safety or risk in an exhibit, (mis)understanding of what a children’s museum is, cell phone use, personal differences and interests, experience playing in a children’s museum/visit frequency, whether they know how to interact, whether materials remind them of or connect them to their own childhood, familiarity of an exhibit’s theme, level of comfort, exhibit open-endedness, gender, their child’s age, their child’s bids to join play, and whether there is text or signage that needs to be read. One factor was mentioned often, but its influence changed depending on implementation: seating within an exhibit is helpful to slow caregivers down and involve them in an activity, but seating off to the side invites disengagement and cell phone use. Finally, some exhibits are simply designed to be more inclined towards family engagement and others for individuals.

Caregivers are not always present with their children during museum visits. Even though they have empathy and understanding for less involved caregivers (see section ‘Staff’ above), museum professionals appreciate involved caregivers, such as “I love it when dads like will come in and they'll like dress up and then they they are on an adventure with their kid. Like they are following along. Um, and I like those parents. Those are my favorites to watch” [Participant 0503]. They also believe that caregiver engagement is beneficial, for example: “So we get a lot of um parents wanting to build with it as well cause it's like, ‘Oh,

this like the [unintelligible] I had when I was a kid. Um but it's just on a big scale. I really want to get into it.' And then the kids, the parents are teaching a little bit the kids about construction, and so as well as them discovering on their own, there is that uh I do think there's a stronger participation of um parent interaction, um particularly with the [specific museum exhibit set of materials]. And I think that is I think that's really valuable" [Participant0402]. Moreover, they recognised caregivers' creative engagements as valuable. For instance, though Participant 0602 did not consider caregivers' creativity to be essential for children's creativity, they did acknowledge its immediate *and* long-term benefits: "I think when parents model um the the joy and their own creative process and their kind of persistence through challenge, um that kids definitely uh are can be inspired by that. Or um see that as something that is, you know, what we do for a lifetime".

Four significant caregiver role sub-themes, capturing caregiver behaviours that participants believed could influence children's engagement and creativity during children's' museum family visits, were constructed from the data (see Figure 7.1): mindfully engaged (e.g., assuming a role within their child's script, playing together with their child and exhibit materials, nondirective prompting and supporting initiation, helping their child), mindlessly engaged (e.g., closed-ended prompting, rushing their child to the next exhibit, taking over the experience and controlling the activity or doing for their child, serving a supervisory role), mindfully disengaged (e.g., learning about their child, such as their interests; engaging in their own creativity or with other exhibit materials in the exhibit, alongside their child; watching their child's play from outside the play frame, such as when children perform on a theatre exhibit stage), and mindlessly disengaged (e.g., taking a break, typically at the edge of an exhibit space, such as to use their cell phone).

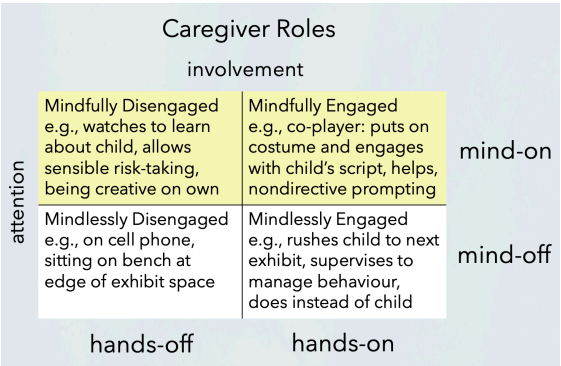
Even though mindful disengagement might appear careless on the surface, regardless of (dis)engagement, mindful caregiver behaviours and roles (highlighted in yellow in Figure 7.1) are believed to be supportive in important ways: "I think parents learn as much from observing their children playing as they do getting into the play. And that was something that I think as an institution we had to learn. I think as children's museums we need to learn that" [Participant 0401]. This also illustrates that, although children's museum benefits were primarily discussed in relation to children's engagement and learning across interviews, children's museum professionals believe that children's museums offer unique opportunities for caregivers too.

Regardless of (dis)engagement, mindless caregiver behaviours and roles were generally not seen to enhance children's creativity, and could actually hinder it. Mindlessly engaged caregivers might be the most detrimental to children's creativity. For example: "the obstacle to creativity comes when the parent wants to take over the experience" [Participant 0401]. In fact, the only instance that mindless disengagement was mentioned as creativity-enhancing was to replace mindless engagement: Participant 0601 acknowledged that caregivers may prevent their children's creativity by being on their phones, but they believed that this behaviour could enhance children's creativity when, "depending on the parent it might, it might be a break to let the kid explore. Like it it could be if you've got a a quote helicopter parent or someone that that might otherwise impede that creativity by being like, put the costume on, take the cart around, get some groceries, cook me dinner."

Across participants, there was little agreement about which caregiver behaviours and/or roles were most common, suggesting the prevalence of not only creativity-enhancing behaviours, but also creativity-hindering behaviours.

Figure 7.1

Caregiver Roles Generated From Museum Professionals' Perspectives



Notable Discrepancies

Museum professionals recognised that exhibits have different opportunities and potential for creativity, but this also led to several discrepancies. *Within individuals,* the majority of participants felt that creativity manifests in all domains, but then stated during the walking tour that art and/or building/making exhibits were the most creative. *Across individuals*, themes repeated themselves, but participants were not always in agreement on

their impact. For instance, some felt that novelty enhanced creativity, whereas others emphasised that familiarity enhanced creativity.

Within institutions, participants held relatively consistent views about creativity and often shared similar anecdotes. However, they were not always in agreement on the potential of individual exhibits. For example, one exhibit was described as "Not necessarily creativity. Just a fun exhibit" [Participant 0201] by a participant whose colleague said that the same exhibit was good for problem solving and "being able to think creatively, what do I have to do next?" [Participant 0202]. Additionally, participants within the same institution were not always in agreement about the target age of their museums, exhibits, and practices.

Across institutions, the balance of approaches taken varies, and museums do not all cater in the same ways to the diverse engagement styles that children might prefer. For example, while some participants highlighted the importance of role-play, such as "Children's museums are different than science centers and even even playgrounds. It. It's, ours anyway, is collaborative role pray role-play with loose props" [Participant 0601], other children's museums tended not to offer opportunities for it, such as "We don't have a lot of role-play . . . I think you [unintelligible] have potentially fewer learning objectives from that kind of experience, so we probably steer away" [Participant 0402].

Finally, there was no significant difference between children's museums that had creativity in their mission statements and those that did not. In fact, even when it is not in an institution's mission statement, creativity is recognised as essential to the children's museum visit; for example: "[the children's museum] wouldn't be any fun if you weren't creative" [Participant 0601].

Creativity-Specific Orientation Efforts

Nearly all participants reported having ways to help frame the visit for creativity or to prompt it in their visitors, but techniques reported were often implicit and rarely explicit. These included exhibit design and materials, such as "we want the the design of the space to compel the interaction, rather than like didactic signage telling people sort of what to do" [Participant 0101], as well as facilitation practices, such as "I think too like some parents might see uh the staff member and then feel guilty and put their phone away and and then they'll be like, yeah, guess I should be doing that. Like I I should be asking those questions" [Participant 0601]. Several participants reported achieving creativity-specific visit framing by

using the term “creativity” in museum marketing and general communications. One participant said that explicit orientation efforts are used more with large groups (e.g., field trips) than with family visitors.

An explicitly “creativity” titled space was observed in two museums, possibly prompting creativity-minded thinking and interactions but, significantly, in both cases, this area was more narrowly focused on art.

Signage was limited in a majority of the museums. Participants shared various reasons for this, including that the environment is already very stimulating, they do not find it gets read, and they believe that using words prevents inclusivity. Where there were signs in the space, these were often highlighted as including prompts, and one participant shared that signs were most likely to be read when they were short and task-driven. Two museums are in the process of developing signage, both generally and to create bilingual signage where only English signage is currently present. However, when probed on whether this added signage is something adult visitors want, neither reported having had requests for it. In fact, one participant at a museum with a low-signage approach said: “I feel like parents will ask questions where the answers are in the signage that is there” [Participant 0101].

Facilitators were often reported as a successful way to provide engagement support and general children’s museum orientation, but this was not necessarily specific to creativity. For example:

> Participant 0202
>
> You have many parents that come to the museum, maybe they've never had a museum experience, and the word museum is not a good museum er or is not a good term for a children's museum. Because when you think museum, you think you go, and you look, and you don't touch.
>
> Interviewer
>
> Mmhmm.
>
> Participant 0202
>
> And we're co- the complete opposite.
>
> Interviewer
>
> Yeah.
>
> Participant 0202
>
> You go, and you look, and you are completely hands-on. It's all tangible. And we'll

have parents that come in and is like, well like do you go and do you interact with all of the things? Yes. Like that's the idea. That's how they're learning.

Interviewer

Mmhmm.

Participant 0202

Right? Um. So yeah, I think we talk about it all the time as a small staff of six that the word children's museum is not great. Now we've come twenty-five years so to change that now, that's difficult because that's what we're known as. Um. But it's really it's more so changing the mindset of people, of what a children's museum is.

Finally, most orienting facilitation efforts, including those related to creativity, are at the caregiver level because "the challenge we have is really the kids get it. It's the parents, you know, you kind of have to prompt the parents" [Participant 0201] and "I think that we want to create lifelong creativity. And we wanna remind adults of their own creativity as well. And that's a really critical part of what we do, is for them to be able to see that in their own children" [Participant 0401].

Measurement

Five of the six children's museums engage in some level of collecting visitor feedback, evaluation, and/or research, and they use this information to make changes to their exhibits. These activities tended to be more formal in larger museums. However, only half of the participants reported considering creativity in any way during evaluations, and, aside from collecting and sharing anecdotes, none of them have a way of measuring creativity. For example: "We haven't quite gotten to the point where we figure out how to evaluate the creativity aspect, cause that's a lot more abstract than evaluating whether somebody is able to do something after one of our programs" [Participant 0301].

Discussion

Children's Museums and Their Visitors

Children's museum professionals believe that children's museums are unique from other settings in children's lives for many reasons, including that they are designed for children, invite hands-on and playful engagement, offer open-ended learning, and help children establish a lifelong foundation of ideas, skills, and abilities by offering opportunities for new exposures and safe exploration. Furthermore, that children's museums are investing in efforts to expand their audience age range signifies a uniqueness in their

engagement practices and learning outcomes that is not only increasingly in demand and valuable beyond young children, but which might also be going unfulfilled in other settings. This supports the distinctiveness of third places, informal educational environments (see Chapter One), and, in particular, children's museums (see section 'The Children's Museum as a Unique Setting' in Chapter Two). The present findings also suggest that the societal conceptualisation of museums can be a determinant of children's museum engagement, including that the term "museum" might be unhelpful, but that museum facilitation can be effective in addressing misunderstandings and supporting visitor engagement.

Findings show that children's museums often reflect their local communities, such as through their exhibits and partnerships. While museum professionals believe that children's museums are a place for all visitors to come across difference, this was not always fully realised. For instance, while the present findings illustrate that some programmes, such as Museums for All, can successfully improve museum access (also see section 'Who?' in Chapter Two), museums need to be more conscious of diverse *family practices,* or they risk being inaccessible and/or exclusionary (also see section '(Mis)match' in Chapter Three). Beyond merely echoing sociodemographic visitor gaps that are already *acknowledged* across the museum field (see section 'Who?' in Chapter Two; see section 'Tension' in Chapter Three), this work has illustrated some successful efforts in engaging nondominant communities by meeting the public where they are and "breaking barriers" to the children's museum, which could benefit all types of informal educational environments. Even so, findings suggest that children's museums have more work to do, as there is also evidence that some of these efforts may problematically perpetuate tensions of power and equity. For instance, the belief regarding individuals from nondominant communities "getting it" after children's museum professionals visit them in *their* communities *before* bringing them *to* the museum (see section 'Community' above) maintains the one-way perspective that museums are doing what is "right", and that visitors can, and should, "learn" to match these expectations and practices, rather than striving to resolve mismatch *together*, and by drawing upon diverse family resources, capital, and practices (see section '(Mis)match Changing with Museum Visiting Experience and Habits' in Chapter Three). Thus, while it is clear that children's museums care about including diverse audiences, this work suggests that they could benefit from being more self-reflective, and at times self-critical, about the ways in which they close gaps. This finding affirms existing concerns in the field and

underscores that future work to decentre the museum voice as "authority" would be indispensable for both research and practice (see section 'Progressing Towards Resolution' in Chapter Three).

Child Creativity Understandings and Beliefs

It is promising for museum practice that children's museum professionals do not hold many misconceptions that reflect common myths of creativity (i.e., creativity is only for some people, mostly for art-related activities, not malleable: Robinson, 2009). Instead, they view child creativity as a process that is condition-dependent but domain general and for everyone but individually expressed. Their recognition that a child's individual creative engagement with their environment can be generative in a variety of domains, uses, and communicative manifestations suggests an understanding of creativity as an experience (see section 'Creativity is an Experience' in Chapter Six). However, the discrepancy that some museum professionals would define creativity as relevant and applicable to a myriad of domains but then describe art and/or building/making exhibits as the most creative suggests a potential practice-oriented misconception. This finding would benefit from having a light shined on it, as individuals' implicit creativity definitions can significantly influence their perceptions of creativity (e.g., Kaufman & Baer, 2004), which might affect how museum staff encourage and facilitate creativity. Clarity between creativity and related terms that are also prioritised by children's museums (e.g., imagination, discovery, exploration) (see Chapter Five, Kupiec, 2024) may also prove especially helpful.

Similar to how children's museums have largely left "play" undefined and unmeasured, despite its central and important role (Luke et al., 2021), a lack of agreement in defining "child creativity" and in identifying its potential across exhibits is apparent. Thus, in addition to their existing practice of reflecting on anecdotes, findings suggest that a shared language of "child creativity" and a way to identify it in their spaces may help establish shared understandings from which children's museum professionals could more effectively discuss and more intentionally support children's creativity. Finally, findings suggest that participants believe creativity is for everyone, but they hold different beliefs about the relationship between child and adult creativity. As children's museums cater to both children and their caregivers (see section 'What?' in Chapter Two), the field may benefit from more clearly delineating this distinction when designing and implementing opportunities for creativity.

Designing for Children's Creativity

The present findings suggest that museum professionals engage in their own creativity. Moreover, they make exhibit design decisions thoughtfully and intentionally; for instance, technology is typically only incorporated when it offers to enhance engagement but, importantly, is rarely the focus of the play itself. Further, findings indicate that many creativity-enhancing elements are implemented in the design and practices of children's museums (e.g., a variety of materials and activities that are open-ended, interactive, and multi-sensory; allowing safe risk; fun, playful, free-choice, and intrinsically motivated engagement; exhibit themes that are relevant and contextual to children's lives; open-ended and open-minded facilitation; permitting mistakes; tolerating appropriate messiness) (see section 'Understanding and Supporting Children's Creativity' above). While exhibits are well-designed to support creativity, findings also paradoxically suggest that it is important to museum professionals to constantly "keep things fresh" *and* that children become more creative with greater visit frequency, in part because they can go deeper at exhibits. Though creativity benefits from a variety of experiences (e.g., Csikszentmihalyi, 1996; Koutstaal et al., 2025; see section 'Experience-Dependent and Opportunity-Linked' in Chapter Six), a balance must be found (also see section 'Balance' in Chapter Three).

Exhibits are themed areas (see section 'Where?' in Chapter Three), and children's museums provide a balance of concrete anchors (e.g., exhibit-themed costumes) and open-ended materials and activities (e.g., art studio engagements), which support children's creativity. Some museums have stricter boundaries between exhibit spaces, but several participants shared that visitors take materials from one exhibit to another to use in different ways. Allowing visitors this flexibility could promote even greater creativity, as evidence suggests that less object-context congruency might decrease mental fixation and increase cognitive flexibility and originality (van Hooijdonk et al., 2022). Moreover, observation supports museum learning (see section 'Observation' in Chapter Three), but the *type* of modelling can affect visitors' creativity. For instance, findings suggest that examples in exhibit spaces can hinder creativity by prompting imitation or suggesting prescribed use, whereas other visitors' engagements can enhance creativity through inspiration. Care must be taken to offer not only a diversity of materials and opportunities but also a presentation and practice that inspires creativity, such as through modelling how to use materials and not what to do with them.

As experiences, creativity and children's museum visits are both influenced by the interaction of individual and environmental factors (see Chapter Three; see Chapter Six). As a result, although some children's museum creativity-enhancing elements can be universally designed for creativity (e.g., interactive exhibit features), others must be pre-planned to offer a variety of potential creative opportunities (e.g., for various ages, interests, levels of museum familiarity) (see section '(Un)predictability' in Chapter Three). The present findings illustrate that children's museum professionals not only understand that children have unique experiences and express creativity in personal ways, but they also do generally provide exhibits and materials to accommodate a diversity of person-environment fits. In fact, children's museums actively strive to provide variety that meets diverse needs and preferences both between visitors *and* across a single museum visit (e.g., opportunities for diverse learning styles are available, such as multi-sensory engagement considerations; exhibits across a museum are balanced to include various ages, with at times designated spaces; busy and quiet spaces are offered, including respite rooms) (also see section 'Variety' in Chapter Three). However, the findings also suggest that individual children's museums might unintentionally preclude some children's preferred styles of play (e.g., by not offering costumes, which could support children's perspective-taking during imaginative role-play). This suggests that there is still room for children's museums to be more thoughtful in offering opportunities that support the varied ways children engage in and express creativity.

Findings also indicate that museum professionals understand that even when an exhibit is designed well, its value, including creativity, is unlocked through and influenced by visitors' engagement. While they acknowledge that children seem to "get it" and predominantly play freely and creatively, they also report that caregivers regularly enact behaviours that can hinder children's creativity. The present findings suggest that caregiver behaviour at the children's museum can enhance creativity when it is either hands-on or hands-off, but it is important that these interactions be mind-on rather than mind-off, which is instead more likely to hinder children's creativity. Various factors emerged from the data that might influence which roles and behaviours caregivers enact (e.g., visitor portrait: (mis)understanding of children's museums, visit frequency, materials reminiscent of their own childhood, their child's age; social situation: cell phone use, their child's bids to join play, museum facilitators; physical environment: available props or materials, perceived

level of physical safety or risk, seating; engagement factors: exhibit open-endedness). That caregiver involvement can enhance children's creativity by being hands-on *or* hands-off during children's engagements, as long as it is mind-on, further supports the arguments presented in Chapter Three that caregivers and children have different roles, behaviours, and types of museum learning during family visits (see section 'Roles' in Chapter Three), and that perspectives relying on conversation as museum meaning-making leave gaps that can be filled by Social Learning Theory, such as observation (see section "Theoretical Underpinnings of Museum Learning" in Chapter Three).

Although orientation efforts can support visitors (Bitgood, 1994; Hooper-Greenhill, 1994; Loomis, 1987), findings suggest that children's museums engage in minimal direct, creativity-specific prompting and visit orientation. Moreover, unintentionally misleading exhibit titles concentrating on creativity as art could inadvertently, but problematically, signal a limited conception of creativity to children's museum visitors.

Finally, while creativity is institutionally recognised, implementation obstacles exist. To optimally support children's creativity, findings indicate that children's museums need to be mindful in their resource procurement and allocation. Additionally, as creativity is a children's museum priority (see Chapter Five, Kupiec, 2024), it should be explicitly considered during exhibit planning. These obstacles differ from those that teachers report as limiting creativity-enhancing practices in schools and classrooms, such as time and testing constraints (Al-Abdali & Al-Balushi, 2016; Harris & de Bruin, 2018; see section 'Understanding and Supporting Children's Creativity' above). Therefore, it is imperative to continue examining creativity in context, including in children's museums.

Spheres of Experiential Influence

Implemented practice generally reflects mission statements' intended practice (see Chapter Five, Kupiec, 2024), but whether creativity was explicitly stated in a children's museum mission statement was not a significant factor. This suggests that creativity-enhancing design and practices are relevant and important to all children's museums. While mission statements focus on creative opportunities provided to visitors through museum exhibits, experiences, play, the community, and a particular domain (see Chapter Five, Kupiec, 2024), the present study has shown that wider considerations need to be made to optimally contribute towards maximising children's creativity. These include the additional themes of the staff and institution. This is unsurprising given that "even if the focus of

interest is on visitor behavior, that behavior is in figurative and literal dialogue with the design intentions of curators and educators" (Leinhardt & Knutson, 2004, p. 46). Nonetheless, findings suggest expanding from the proximal factors of the visit to include more distal influences and the larger cosmos of their interactions. Since little museum research to date has researched the museum itself (Luke & Windleharth, 2013), this finding for broader self-reflection and comprehensive considerations could serve as a helpful approach for more than just creativity. Thus, future research and practice may benefit from applying Bronfenbrenner's Ecological Systems Theory (1979) and accounting for how distal influences, such as institutional ethos and community partnerships, exert their influence and contribute towards informing design and practice decisions, which in turn shape the physical environment and social situation that visitors engage with, and, ultimately, their museum learning.

Evaluation and Research

Many of the ways in which museum professionals report internally discussing creativity are anecdotal. While helpful for contributing to the development of their institutional practice, and reflecting improvement science, a shared language and creativity measure would also support field-wide conversations. In fact, findings indicate that children's museums *do* collaborate, visit each other, share ideas and practices, and inspire each other, despite literature suggesting that evaluation work is not always accessible (Adams, 2012; Luke & Windleharth, 2013). Further, the present walking interviews found many common exhibit types (e.g., water tables, makerspaces, art studios) and shared practices, even when children's museum professionals reported having distinct identities that influenced some aspects of implementation. Thus, future research and evaluation may be well-supported by the application of an implementation science approach, which could reach across institutions and offer field-wide benefits. Findings also suggest that support for evaluation and research would be especially valuable for small- and medium-sized children's museums.

Limitations and Future Directions

Museum professionals can design exhibits and facilitate visits, yet the experience and its outcomes depend on visitors, their sense of place, and their engagements. Findings suggest that even when provided with creative opportunities, visitors may not always have a willingness to engage in creativity (see section 'The Distinct Contribution of Each

Component to Creativity as a System' in Chapter Six). For example, present findings indicate that children's museums encourage experimentation and prioritise physical safety; however, children's creativity is at times hindered by fear, indicating that they may not always feel psychologically safe to be creative. In addition, findings suggest that caregivers overstep when materials appear risky or unsafe to them, indicating a potential misunderstanding between safe but risky play and hazardous play (Little et al., 2011; Keeler, 2020). This form of mindless engagement may stifle creativity because "if too many obstacles are placed in the way of risk and exploration, the motivation to engage in creative behavior is easily extinguished" (Csikszentmihalyi, 1996, p. 11). These findings suggest the presence of important museum-visitor misalignments, yet this work is limited by its exclusive focus on the perceptions and perspectives of museum professionals (see section '(Mis)alignment' in Chapter Three). Future research with visitors, both caregivers and children, is needed.

Findings indicate that children's museum professionals are cognisant of inclusion concerns and aware of representation gaps in their visitorship, and they are actively exploring ways to better serve the full diversity of their communities. However, these efforts may, at times, position the museum as offering the "right" way to play and learn, such that benefits can only be maximally realised when families "understand". The societal conceptualisation of museums and the role that the tensions of power and equity have in museum research and practice continue to be imperative areas for future work (see section 'Tension' in Chapter Three).

The present findings also indicate that caregivers are not always mindful during family visits, which can hinder children's creativity. While this suggests great potential for children's museums to improve creativity-oriented communication to mobilise caregivers, future research is needed to explore *how* to support caregivers in enacting mindful behaviours, and whether this translates to increases in children's creativity. That museum professionals also exemplified a sincere understanding that caregivers may want, or even need, a moment to recharge suggests that a deeper understanding of caregivers' views is paramount in developing effective and acceptable caregiver-directed nudges.

As shown in Figure 7.1, thematic analysis suggested four quadrants of caregiver behaviours at the children's museum; future family observations could build a more nuanced understanding by plotting these behaviours along the axes and investigating

whether within-quadrant differences affect children's creativity. In addition, that mindfully engaged and mindfully disengaged behaviours are distinct suggests that the ways in which they enhance creativity may function through different paths. For instance, behaviours of a mindfully disengaged caregiver include engaging in their own creativity and stepping back for their child to take sensible risks, which supports a psychologically safe social environment that values and *allows* children's creativity. On the other hand, one behaviour of a mindfully engaged caregiver is interacting with their child as a co-player who *contributes* to a pretend play scenario, which would not only alter the child's social environment but also constitute an episode of group creativity (see section 'Group Creativity' in Chapter Six). Thus, future research exploring the differences between caregivers' behaviours and their influence on children's creativity during children's museum family visits could help advance understandings in the field of creativity, including of intergenerational group creativity.

As engagement is one of the distinctive components of an experience (see section 'Experience' in Chapter Three), it is imperative to note that caregiver (dis)engagement, as used in this work in relation to caregivers' behaviours during children's museum visits, refers to *physical* (dis)engagement. However, experiential engagement can manifest as different types of individual-environmental engagement (see section 'Engagement' in Chapter Three). Thus, for instance, caregivers' mindful disengagement still constitutes as experiential engagement, as it maintains *cognitive* engagement. Additionally, mindless disengagement can represent an experience, as the decision to be so is made consciously within the broader decision to engage with a museum visit in the first instance. Consequently, by being present, caregivers still have a museum *experience*; however, their behaviours and the type(s) of ways in which they engage (e.g., physically, cognitively) may determine how absorbed they are in the visit and, thus, the *type* of their experience (i.e., a transactional, interactive, or immersive experience) and its generativity.

Similar to prior research (e.g., Taylor & Kervin, 2022; see section 'Macroexperience' in Chapter Three), findings suggest that children's museum experiences leave an impact that extends beyond the visit. In line with children's museum mission statements (see Chapter Five, Kupiec, 2024), present findings show that museum professionals feel they are *nurturing* creativity over and above supporting episodes of it. Moreover, the benefits of caregivers' mindful disengagement on children's creativity may be more prominent over

time. For instance, when caregivers step back from children's sensible risk-taking or model their own creative engagement, they may be expressing that they value creativity, thereby potentially contributing to the positive long-term development of children's creative self-identities. Additionally, findings suggest that mindful disengagement supports caregivers in learning about their children's interests and abilities and, further, that they seek additional opportunities to pursue these beyond the museum. Therefore, not only do children's museums and researchers need to push the boundary of evaluation approaches to understand and measure creativity during a single visit, but also over time. This further supports the distinction drawn between experiential time spans in the Visitor Experiencescape (i.e., the microexperience and macroexperience) (see section 'Visitor Experiencescape: Time' in Chapter Three).

Mission statement analysis findings suggest that creativity is not only valued as a goal, but also as a *mediator,* primarily towards learning (see Chapter Five, Kupiec, 2024). This was rarely mentioned by participants. Similarly infrequently, but notable, participants discussed other types of museum learning as mediating future creativity, suggesting their recognition of the importance of a variety of novel experiences and opportunities for nurturing creativity (see section 'Experience-Dependent and Opportunity-Linked' in Chapter Six). Nonetheless, exhibits were at times spontaneously rated oppositely to one another in terms of their potential for creativity and learning. Likewise, affective-conative states may be particularly facilitative for children's creativity (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components' in Chapter Six); however, the connection between fun and creativity was not always made, despite that the hindrance of negative affective-conative states often was (e.g., fear). Moreover, findings suggest that caregiver engagement is influenced by their affective-conative states (e.g., nostalgia). Experiences designed to be educational and eliciting a positive affect are ways through which children's museums *intend* to achieve creativity (see Chapter Five, Kupiec, 2024), but their *implemented* practice would likely benefit from a deeper understanding of the relationships between creativity and its components (e.g., creativity and learning (i.e., the thinking leaflet), creativity and affective-conative states).

While stating the importance of community, relatively absent from interviews was the role of peers, both siblings and other visitors, aside from inspiration and imitation. There is more to learn about how these dynamics might affect children's museum visitors'

engagement and learning, including creativity, particularly as parents from different cultural backgrounds attribute museum learning to different actors (e.g., the child themself, interaction with a parent, interaction with a peer) to varying degrees (Fasoli, 2014). Finally, as creativity is conceptualised differently across cultures (e.g., Mullet et al., 2016; Sawyer, 2012; Runco & Johnson, 2002), this work is limited by its focus on American children's museums. Future work in diverse cultural contexts is needed.

Conclusion

Children's museums reflect children, their real-world contexts and interests, and their learning styles and behaviours, all while striving to help them prepare for their futures. In their exhibit design and facilitation techniques, children's museums implement many creativity-enhancing design elements and practices. However, a shared language for child creativity could help the field have more productive conversations. In addition, children's creativity and the factors that influence it might be better understood, and thus optimised, if there were a tool that could help researchers and museum professionals recognise and measure creativity during exhibit engagement. To maximally unlock the creative potential of children's museum opportunities during family visits, caregivers would likely benefit from more explicit creativity-specific visit orientation and museum-provided support to enact mindful behaviours. Future research is needed to explore what type of caregiver-directed support would be most helpful, how it might be effectively implemented, and whether this can, in turn, enhance children's creativity.

Chapter 8

Mobilising Caregivers: Understanding Perceptions to Support Creativity-Enhancing Mindful Behaviours at Children's Museums

Introduction

Children's museums offer a promising context for enhancing children's creativity (see section 'Children's Creativity in Context' in Chapter Six). This work, thus far, has found that not only do children's museums prioritise creativity (see Chapter Five, Kupiec, 2024), but they are also designed in ways that are conducive for children's creativity (see Chapter Seven). However, experience design can only contribute towards museum learning. Caregivers also play a significant role in shaping children's experiences, including their creativity, during family museum visits (see Chapter Three; see Chapter Six; see Chapter Seven). For example, museum exhibits elicit different levels of child exploration, which are further influenced by adults' "coaching styles" (van Schijndel et al., 2010). Relatedly, creativity is influenced by and expressed with(in) an environment that is physical *and social* (see Chapter Six). In fact, social and psychological environments may have greater effects on creativity than the physical environment does (Abdulla & Cramond, 2017; Amabile, 2003), especially in children (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components' in Chapter Six). For instance, evidence suggests that it may not be an enriched physical environment alone that helps children perform higher on divergent thinking creativity assessments, but also being prompted to look around and use environmental cues (Friedman et al., 1978). Additionally, evidence suggests that there is a highly positive and significant relationship between courage and creativity in 60–72-month-old children (Çiçekler & Aral, 2022), and, according to Harrington (1990), "while creatively active individuals need *courage*, creative ecosystems should provide *encouragement*" (p. 158, emphasis in original).

According to Rossman and Duerden (2019), "great experiences require both great design and great delivery. An amazing experience design can quickly become meaningless if the delivery is poor" (p. 138). In the context of family museum visits, the delivery relies, in part, on caregivers supporting their children (see Chapter Three). Observational findings suggest that children engaged in children's museum exhibits with highly involved adults, as opposed to somewhat or not involved adults, learn more (e.g., Puchner et al., 2001). On the other hand, observations have also shown that greater adult involvement in children's

museums can be unhelpful, sometimes interfering with children's unconventional and playful object engagement (e.g., Snow-Dockser, 1987). Conflicting findings might be better understood in light of evidence suggesting that, in addition to the degree of their involvement, the type of caregivers' attention during children's museum visits, mindful versus mindless, influences children's experiences (see Chapter Seven). This is particularly relevant as the meaning of "museum learning" expands from a narrow focus on content and factual knowledge, including to the present focus on children's creativity (see section 'Why?' in Chapter Two). For instance, an adult's role during exploration and play significantly impacts children's creativity (Hoicka et al., 2018; Lillard et al., 2013; Mellou, 1995; Pellegrini & Greene, 1980; Tok, 2022), highlighting the importance of *how* caregivers behave during children's museum visits. In fact, evidence suggests that the type and degree of parent engagement influences families' creativity during library and museum engineering programmes (Kim & Zimmerman, 2020; Kim & Zimmerman, 2023; see section 'Family Visits' in Chapter Six). Emphasising the importance of considering the type of caregivers' attention over and above involvement, as well as the significance of their mindful awareness in flexibly and responsively alternating between behaviours, "research supports the view that a suitably qualified tutor who knows when to participate and when not to, is the one who encourages children's creativity more" (Mellou, 1995, p. 101).

Findings of Study 2 (see Chapter Seven) suggest that the behaviours and role(s) caregivers enact during children's museum family visits influence their children's creativity. To enhance creativity, caregivers can be either hands-on or hands-off, but it is important that they are mind-on in relation to their child's experience; alternatively, being mind-off is more likely to hinder their child's creativity. However, it is unknown *why* caregivers are not always interacting using mind-on behaviours during family visits to children's museums, what guidance may best encourage their creativity-enhancing behaviours, and how they might be most open to receiving such support. Social Learning Theory asserts that an individual's personal factors, environment, and behaviours reciprocally determine each other, such that "cognitive factors partly determine which external events will be observed, how they will be perceived, whether they have any lasting effects, [and] what valence and efficacy they have" (Bandura, 1978b, p. 345). In addition, an individual's self-efficacy, beliefs, and goals influence their behaviour (Bandura, 1988; Bandura, 1978b). In line with this framework, one promising approach is to examine caregivers' perceptions,

expectations, and beliefs about children's museums, including their role during family visits, as well as their understandings of child creativity, its place in children's museum experiences, and the opportunities for it during their visits. These insights could contribute towards informing the design and effective delivery of appropriate caregiver-directed support.

Mobilising Caregivers

Caregivers may not understand the purpose(s) of an exhibit or how to (inter)act with(in) it and their children in the unique environment of the children's museum (Lewin, 1989; Luke & Windleharth, 2013). However, as guided play rests on adults both setting up children's environments *and* scaffolding their moment-to-moment engagement toward a particular learning goal (Toub et al., 2016), children are likely to be optimally supported when their caregivers' and children's museums' priorities and goals are aligned, *and* when caregivers are willing and able to facilitate towards these. Moreover, evidence suggests that proximal creativity support in the workplace (e.g., supervisor, manager) is more effective than distal support (e.g., organisational level) (e.g., Amabile & Pratt, 2016). Thus, although children's museums and their staff value creativity and offer opportunities for it (see Chapter Five, Kupiec, 2024; see Chapter Seven), children are likely to benefit substantially from caregivers who enact creativity-enhancing mindful behaviours.

In addition to museum and caregiver factors directly impacting children's creativity (i.e., the child's microsystem), the interrelations and interactions between a child's caregiver and the museum can ultimately also influence the child (i.e., the child's mesosystem) (Bronfenbrenner, 1979). For instance, evidence has shown that museum-provided interventions can effectively support caregiver interactions and, in turn, child engagement outcomes and exploratory behaviours (e.g., Kupiec et al., 2023; van Schijndel et al., 2010). While museum design, practice, and orientation can successfully support caregivers (see section 'Supporting Caregivers' in Chapter Three; see section 'Creativity-Specific Visitor Support' in Chapter Seven), "a classic mistake of experience design is to begin with your end in mind rather than what your participants want" (Rossman & Duerden, 2019, p. 19). In fact, "every day, design teams make incorrect assumptions about people" (Holmes, 2018, p. 35), and a wealth of evidence suggests that misalignment does exist between museum professionals and caregivers, including about caregivers' roles during family visits (see section '(Mis)alignment' in Chapter Three). Although museum professionals show

understanding, respect, and empathy towards caregivers who choose to be less present during their visit, they also express an appreciation for those who interact mindfully and recognise this as an important way to enhance children's creativity (see Chapter Seven). Without careful consideration of caregivers' perspectives, caregiver-directed support may not be aligned enough with their children's museum visit expectations and beliefs, which could detrimentally undermine the ability of well-intentioned efforts to bring about positive caregiver behaviour change and, in turn, to enhance children's creativity.

A key factor that may influence children's museum-visitor (mis)alignment and the behaviours and roles that caregivers enact is visit frequency, as "the tendency to evoke perceptions, activities, and patterns of interpersonal relation consistent with role expectations is enhanced when the role is well established" (Bronfenbrenner, 1979, p. 92). In fact, children's museum family visiting groups may interact with each other less and engage with hands-on and activity elements more during repeat visits (Wood & Wolf, 2010), suggesting that caregiver role expectations may significantly change with visit frequency. In addition, despite not being motivated to visit children's museums for learning, parents reported *after* their visit that their children's learning was a benefit (McInnes & Elpidoforou, 2018), suggesting that caregivers' beliefs related to children's museums as an opportunity for creativity may also change with museum experience. Moreover, museum professionals report deeper exhibit engagement and greater creativity in visitors with familiarity gained through repeated visits (see Chapter Seven). It is not only necessary to consider whether or not an individual has been to a museum, but also the number of their visits, as sociodemographic gaps are lower when using visit incidence (i.e., having gone to at least one museum in the past year) than frequency statistics (i.e., visiting museums often) (Wilkening, 2023), and occasional museum participants are more similar to nonparticipants than frequent participants (Hood, 1983/2007).

Wise Interventions

Wise interventions focus on the understandings and beliefs that individuals already have and then, using theory and research, implement brief and minimally directive supports that offer new information that alters their understandings of themselves, others, and/or their situations; as a result, wise interventions tap into an existing potential, in that what *is* remains objectively unchanged, both the situation and the person, but individuals' subjective meaning-making, interpretations, and beliefs about themselves, others, and/or

their situations change, leading to altered behaviours that can better leverage available opportunities (Walton & Wilson, 2018). This is promising for the museum context, as museums are designed free-choice settings in which visitors can be guided but not directed, and each visit is uniquely shaped by the visitor portrait, including visitors' prior knowledge, understandings, and beliefs (see Chapter Three). Moreover, caregivers may not need to *gain* skills but instead recognise the museum as an opportunity to utilise them (Kupiec et al., 2023), suggesting that a shift in perspective could have a substantial impact on positive behaviour change. Additionally, according to Walton and Wilson (2018), by altering meanings that successfully alter behaviour, wise interventions can initiate a self-enhancing cycle, and "if the goal is to change meanings then a single dose but one that alters a recursive process may cause lasting change. Timing—early in a transition or experience—may be more important than dosage for wise interventions" (p. 635). This further signifies the relevance of wise interventions and their brief, minimally directive approach for the museum context, as museum visits are typically short in duration (see section 'Microexperience' in Chapter Three), tend to be infrequent but leave a long-lasting impact on their visitors (see section 'Macroexperience' in Chapter Three), and are influenced by visitors' pre-visit motivations, agendas, and expectations (see section 'Why?' in Chapter Two).

Change stemming from wise interventions requires both personal *and* situational capacity (Walton & Wilson, 2018). In fact, according to Bandura (1978a), "to raise by persuasion expectations of personal competence without arranging conditions to facilitate effective performance will most likely lead to failures that discredit the persuaders and further undermine the recipients' perceived self-efficacy" (p. 146). Walton and Yeager (2020) have characterised two components of psychologically wise interventions: the "soil" and "seed". Findings of Study 1 (see Chapter Five, Kupiec, 2024) show that family-friendly elements are one way through which children's museums endeavour to achieve creativity, suggesting opportunities not only for children but invitations for caregivers too. Further, findings from Study 2 suggest that children's museum exhibits are well-designed for creativity, but that a promising avenue for enhancing children's creativity may lie in supporting caregivers in being more mind-on. Taken together, these findings suggest that the children's museum "soil" is already fertile for creativity and a "seed" could likely shift individuals, in this case caregivers. However, more information about caregivers'

understandings and beliefs is needed to inform the development of a caregiver-directed "seed" that can feasibly and effectively harness this ripe creativity-enhancing potential.

Applying a Behaviour Change Model

To guide this work, the Information-Motivation-Behavioral Skills (IMB) behaviour change model (Fisher & Fisher, 1992) has been borrowed from the field of health research. According to the IMB model, an individual's information about and motivation towards (i.e., personal attitudes, social norm perception, social support) a behaviour can influence each other, while each can also independently and directly influence their behaviour. Furthermore, both information and motivation can independently influence an individual's behavioural skills (i.e., objective abilities and self-efficacy), which, in turn, can directly affect their behaviour. Research exploring teachers' understandings and practices suggests that teachers have accurate creativity-related information, but that they may not act on them due to a lack of motivation (e.g., believing it is important to quickly cover curriculum content instead) and/or behavioural skills (e.g., a lack of creativity-specific professional development) (e.g., Al-Abdali & Al-Balushi, 2016; Harris & de Bruin, 2018). Thus, while much less is currently known about caregiver understandings and beliefs, applying the IMB model and its three constructs may be helpful in the present work and important for mobilising caregivers.

Both wise interventions and the IMB model have been successfully applied to adult-directed interventions that produce positive behaviour change not only at the adult level, but that also ripple into behaviour change at the child level (e.g., wise interventions: Okonofua & Ruiz, 2021; the IMB model: Small et al., 2012). This indicates promise in drawing upon these approaches for the present application of supporting caregivers and, more specifically, in targeting their behaviours as an avenue to enhance children's creativity during children's museum family visits.

Caregivers' Creativity-Related IMB Understandings and Beliefs

The IMB model specifies three key areas of creativity-related understandings and beliefs that could influence caregivers' behaviours during children's museum family visits. Firstly, it could be that caregivers lack *information* about creativity and, as a result, are not aware of the positive benefits of creativity-enhancing behaviours. For example, nearly half of parents believe that creativity is fixed and innate (Karwowski et al., 2022). It could also be that caregivers are not *motivated* to enact creativity-enhancing roles. In fact, "creativity

must be valued by the individual before investing in its enhancement" (Runco, 1996, p. 14), and "individuals seem likely to be more creative when they are provided information that creativity is desirable" (Byron & Khazanchi, 2012, p. 826). Additionally, even if caregivers have accurate creativity information, know how to support their child's creativity, and value creativity, they might not feel motivated to do so in the public space of the children's museum, as evidence suggests that evaluative contexts and the fear of being judged hinder creativity (Byron et al., 2010; Kelley & Kelley, 2021). Finally, caregivers could be limited by their abilities and their self-efficacy, or their *behavioural skills*. Little work to date has explored caregivers' knowledge of and abilities to implement creativity-related behaviours. However, evidence does suggest that adults feel greater anxiety about situations requiring creativity than similar situations that do not require them to be creative, and that this difference is more pronounced in women (Daker et al., 2020). Additionally, creative self-efficacy is situationally specific (Karwowski et al., 2019), and evidence suggests that caregivers might feel uncomfortable playing in the public setting of the children's museum, choosing instead to teach (Dooley & Welch, 2014; Shine & Acosta, 2000; Wood & Wolf, 2010), which might be perceived as a more comfortable role.

Fisher and Fisher (1992) suggest that research using the IMB model take on a three-phase process of (1) elicitation research, (2) intervention, and (3) evaluation, and, moreover, that interventions developed from elicitation research are more effective. Thus, this study will serve as a first step of elicitation research. As such, it seeks to gather and explore caregivers' creativity-related information, motivation, and behavioural skills understandings in order to identify where targeted caregiver guidance might be most effective, findings which could contribute towards informing the development of an intervention "seed".

Intervention Acceptability and Opportunity

To inform the effective implementation of caregiver-directed support, it is important to consider how such support might be best received and, consequently, utilised by caregivers. Casale et al. (2023) proposed a framework of intervention acceptability with the following nine cognitive and affective components: affective attitude, intervention understanding, perceived positive effects, relevance, perceived social acceptability, burden, ethicality, perceived negative effects, and self-efficacy; further, while acceptability can create an *intention*, individuals must also recognise the *opportunity* to engage. Therefore, in addition to understanding what creativity-related understandings caregivers would most

likely benefit from, it is essential that this support is delivered in a way they find acceptable and, moreover, that they recognise the children's museum as an opportunity for them to enact creativity-enhancing mindful behaviours.

Findings of Study 2 (see Chapter Seven) illustrate that children's museums are generally well-designed for children's creativity, and evidence suggests that caregivers and children recognise that museum exhibits can be a place for creativity (Dockett et al., 2011; McInnes & Elpidoforou, 2018; Song et al., 2017). However, it is unknown whether caregivers view the children's museum as an opportunity for them to be creative alongside or with their children, and whether they believe that supporting their children's creativity is part of their role during family visits. In fact, caregivers may need a break from playing with their child and view the children's museum as a place for this (e.g., Wood & Wolf, 2010; see Chapter Seven). Additionally, though caregivers believe that interacting with their children supports their children's learning during museum visits, they find that other demands and distractions make it difficult to do so, and they recognise the children's museum as a venue for safe, independent play (Dooley & Welch, 2014). As a result, caregivers' non-engagement may not reflect a lack of ability, but rather a belief "that the museum staff are the "experts" and have designed the exhibit or element so that parents are not necessary to the child's experience" (Wood & Wolf, 2010, p. 43). As free-choice settings, understanding caregiver-children's museum role belief (mis)alignment is essential for informing an intervention that caregivers feel is informative and relevant, without being burdensome.

Families benefit from different types of guidance during museum visits, but not all mediation content or modes of delivery are equally productive (e.g., Benjamin et al., 2010; Letourneau, Meisner, & Sobel, 2021; Willard et al., 2019). Museum guidance can be instructional and explicit (e.g., signs with prompts, concrete examples, or information and knowledge about; handouts or pamphlets; floor staff teaching) or experiential and implicit (e.g., observing other visitors, talking with other visitors, opportunities for trial-and-error, physical design elements and materials, an exhibit's theme, floor staff modelling). While museum professionals acknowledge that caregivers benefit from prompts and support during family visits, including for creativity, these are rarely direct or explicit; instead, children's museums tend to rely on implicit efforts (e.g., intuitive exhibit design, play-based facilitation as modelling, implied institutional ethos) (see Chapter Seven). Caregivers' mind-off behaviours may, in part, be a result of implicit designs that do not provide enough

support, such that providing direct, creativity-explicit orientation and guidance may be beneficial. In fact, evidence has shown that the combination of informational signage (e.g., explicit efforts) with interactive design (e.g., intuitive cues) supports caregiver engagement in children's museum exhibits (Gaudreau et al., 2021).

Lastly, intervention implementation practicality differs. For instance, findings of Study 2 (see Chapter Seven) suggest that children's museums are intentionally low-signage environments and that museum professionals prefer providing guidance through facilitator interactions; however, these findings also suggest that museum facilitation is not only limited by staffing demands, but that even with training, facilitators vary in skill. Further, museum visits tend to be short and infrequent, and museums are nonprofit organisations limited in resources (e.g., funding, staff). Thus, it is essential to consider the implementation science principles of fidelity, feasibility, and scalability (Halle et al., 2013), as these can impact a children's museum's institutional acceptability and capacity to implement an intervention. In fact, evidence suggests that institutional ethos and decisions significantly influence opportunities for and expressions of children's creativity (see Chapter Seven). Therefore, understanding caregivers' perspectives could also support children's museums in making more informed institutional decisions, including how to optimally spend limited resources without sacrificing potential benefits of intervention engagement.

Research Aims

Caregivers' understandings and beliefs about children's museum family visits and child creativity can influence their in-museum behaviours and, in turn, their children's creativity. Elicitation research rests on the notion that something cannot be effectively improved before its baseline is well understood. Thus, this study seeks to contribute to future intervention work by *informing practice*. It aims to do this by exploring what caregivers think about children's museums and creativity, investigating which caregiver understandings and beliefs might be most effectively targeted in order to positively change their creativity-related behaviours during children's museum family visits, and examining how they might be most open to receiving support by answering the following research questions:

> RQ9: What beliefs and expectations do caregivers of children aged 5–8 years hold about children's museum priorities and engagement?

RQ10: What do caregivers of children aged 5–8 years believe about children's museums as an opportunity for creativity?

RQ11: How do caregivers of children aged 5–8 years define child creativity?

RQ12: What degree of creativity-related information, motivation, and behavioural skills do caregivers of children aged 5–8 have?

RQ13: What type of intervention might caregivers of children aged 5–8 years most accept in supporting their children's creativity?

RQ14: (How) Do the perceptions of caregivers differ by museum visit experience (i.e., frequent visitors, occasional visitors, nonvisitors), the pedagogical approach of their child's school, their gender, their educational attainment, and their race?

Methods

For a detailed explanation of the methods for Study 3 that have been abbreviated here as part of the Integrated Thesis format, see Chapter Five, section Study 3: Informing Practice.

Data Collection

A survey was used to explore caregivers' perceptions and expectations of children's museum visit priorities and engagement during family visits, including the role of adults; their beliefs about opportunities for creativity at the children's museum; their understandings of child creativity and of creativity-related information, motivation, and behavioural skills; and whether, what, and how they might accept learning more about child creativity. For a full description of survey development and survey items, see section 'Survey (Re)development' in Chapter Four. See Appendix N for the survey used for data collection.

To be included in this study, adults needed to be at least 18-years-old; the parent, guardian, or regular caregiver of at least one child aged 5–8 years; and reside in the United States of America. Data was collected online, and the survey was hosted by Qualtrics. Informed consent was obtained from participants on the first page of the survey link. If "no" was selected for any of the responses on the information and consent page, the participant was automatically sent to the final survey page thanking them for their time. Participants could withdraw from the study at any time by closing the web browser or Qualtrics tab. Qualtrics was set to not record incomplete responses, such that withdrawing automatically removed all data. Once the survey was completed, the withdrawal of data was not possible, as it was recorded de-identified and anonymous, and IP addresses were not recorded.

Participants

In total, 85 response entries were recorded. Four entries were removed because the survey automatically ended after the consent and inclusion criteria page, as these individuals indicated “no” to being the parent, guardian, or regular caregiver of a child aged 5–8 years. The final sample size for this study is n = 81.

Data Analysis

Survey responses were exported from Qualtrics to Microsoft Excel (Microsoft Corporation, 2024). Ranking items were analysed in Microsoft Excel by calculating the mean and standard deviation of each item option’s ranking across participants. The countif() function in Microsoft Excel was used to identify how many times each item was ranked at each rank-order value. For items in which participants were asked to select the top three options from a list of nine, a column for each response option was created and the response list output was transformed, such that each column had a “1” entered if it was one of the options chosen by a participant and a “0” if it was not. The countif() function was used to identify how many times “1” appeared for each option. The proportion of total selections per option (i.e., the overall percent) was calculated by dividing the count by 243 (81 participants * 3 options selected per participant), and the proportion of participants who chose each option (i.e., the percent of the sample) was calculated by dividing the total count by 81 participants.

All Likert scale item responses were recoded with equidistant numerical values centred on zero: a response of “strongly disagree” was recoded to -1.5, “disagree” to -0.5, “agree” to 0.5, and “strongly agree” to 1.5. The mean for items using the Likert scale response format to explore caregivers’ familiarity with children’s museums, their beliefs about the children’s museum as an opportunity for creativity, and whether they would like to learn more about child creativity were calculated in Microsoft Excel.

Information, motivation, and behavioural skills items necessitating reverse coding were recoded, such that -1.5 was recoded as 1.5, -0.5 as 0.5, 0.5 as -0.5, and 1.5 as -1.5. See Appendix M, Table M1 for indication of which survey statements belonged to each category and which were reverse coded. Across all participants and information, motivation, and behavioural skills statement responses, there was one missing value. Rather than exclude the participant from analysis, the empty cell was replaced with the mean of the other 80 participants’ responses for that item. To analyse and compare participant responses to

information, motivation, and behavioural skills statements, data was exported from Microsoft Excel and analysis carried out in RStudio (RStudio Team, 2022). The mean score for each item was calculated. Then, the mean score for each of the three IMB categories was calculated, and an ANOVA was conducted to examine whether these differed significantly from each other.

Definitions of "child creativity" were imported into NVivo (QSR International Pty Ltd., 2018) for analysis. One participant chose not to define "child creativity". As a result, a total of 80 definitions were coded. Thematic analysis was performed, inspired by Braun and Clarke (2006; 2019). After data familiarisation and initial note-taking, a first round of coding generated and applied initial codes. Each definition could be assigned multiple codes, so as not to lose important insights. A second round ensured that all codes generated from later definitions had been considered and applied across the full data set. Next, while reflecting on the definitions, codes were thematically grouped. During this process, some codes were merged. The coding framework was exported from NVivo and refined. Clear names for themes and codes were decided. See Appendix P for the coding framework developed through this process.

Due to the small sample size, a relatively homogenous and skewed participant group, and inconsistent responses about museum visitation, analyses were unable to be conducted to explore differences between subsets of participants (RQ14) (see section 'Limitations and Future Directions' below). In total, 84% (n = 68) of participants identified as female and 88% (n = 71) of participants identified as White or Caucasian, with an additional two participants identifying as White or Caucasian and another racial or ethnic group. Nearly half of participants completed a post-graduate education degree (n = 37, 46%), while only five participants (6%) held a highest level of completed education of a high school diploma, 10 (12%) an associate's degree, and 29 (36%) an undergraduate degree. Additionally, the majority of participants' children attended public school (n = 54, 67%). A further 17 participants' children attended a variety of non-public school types (e.g., private, Montessori, religious, charter, homeschooling), and the remaining 10 participants elected not to respond to the item or provided too little information to determine school type (e.g., "Elementary").

Questions asking participants to list all the museums they have visited and how many times they have visited a children's museum in the last year resulted in inconsistent

responses. For instance, some participants listed children's museums but then said they had been zero times to a children's museum, such that visit frequency could not be determined. On the other hand, some participants did not list any children's museums but then reported that they had been to a children's museum several times. It is unknown whether the visitation reporting count was accurate and participants did not feel that they needed to list children's museums they visited because it would be accounted for in their report of visit frequency, or if this reflected a misunderstanding in what a children's museum is. The significant discrepancy identified between responses for the two items was too great to have confidence in the self-reported survey data, and, consequently, reliable or meaningful comparisons could not be made (see section 'Limitations and Future Directions' below). Finally, only four participants in total reported that they had not visited any museums in the last year, further suggesting that the sample is not only homogenous but also representative of museumgoers.

Results and Discussion

Caregivers' Children's Museum Perceptions

Caregivers report high familiarity with children's museums, with only one participant strongly disagreeing, zero disagreeing, 29 agreeing, and 51 strongly agreeing with the statement "I am familiar with what a children's museum is." (M = 1.10, SD = 0.56). Indicating a level of pre-visit confidence in their perceptions, which could potentially strengthen caregivers' commitment to their pre-visit motivations, agendas, beliefs, and expectations (see section 'Why?' in Chapter Two; see section 'Visitor Experiencescape: Visitor Portrait' in Chapter Three), the following set of results explores what these are. Meaningful points of misalignment between caregivers' perceptions and those of children's museum institutions and museum professionals are also discussed.

RQ9: What beliefs and expectations do caregivers of children aged 5–8 years hold about children's museum priorities and engagement?

Results in Table 8.1 suggest that caregivers prioritise children's museums more for the purpose of engagement itself (i.e., "exploration", "discovery", and "play") than for a specific or directed type of generativity (i.e., "curiosity", "creativity", "learning"). While not entirely surprising given that caregivers do not always link play and learning (Fisher et al., 2008) and report visiting children's museums to play more than to learn (McInnes & Elpidoforou, 2018), this presents a significant point of misalignment with children's

museums, where “learning through play” is fundamental. In fact, indicating institutional priority, the same terms that caregivers were asked to rank appear in children’s museum mission statements in the following order: *learn*, play, inspire, family, creativity, explore, discover, community, curiosity (see Chapter Five, Kupiec, 2024).

According to Pine and Gilmore (2020), experiences that shift from passive to active participation move from entertainment to education. If adults see more entertainment value (e.g., play) than education (e.g., learning), as suggested by term ranking, it might be that they are *intending* to be passive, representing a misalignment of expectation and, consequently, their role. In fact, although evidence suggests that caregiver facilitation during family museum visits can effectively support children’s engagement and learning, including creativity (see Chapter Three; see Chapter Six; see Chapter Seven), caregivers rank “family-oriented” lower than children’s museum mission statements prioritise “family”. This may reflect that caregivers do not recognise opportunities for *them* to be participants or learners, despite that children’s museums are designed to cater to young audiences *and their caregivers* (see section ‘What?’ in Chapter Two; see section ‘Supporting Caregivers’ in Chapter Three; see Chapter Seven) and, further, that caregivers gain unique benefits from children’s museum visits (see section ‘Roles’ in Chapter Three).

Table 8.1

Caregivers’ Rankings of Children’s Museum Priorities

Visit reason	Count of each rank									Mean rank	Standard deviation
	1	2	3	4	5	6	7	8	9		
exploration	17	13	15	9	13	8	2	2	1	3.44	1.99
discovery	16	9	17	11	9	9	4	4	1	3.75	2.15
play	16	16	8	14	7	5	4	3	7	3.85	2.50
curiosity	7	15	14	12	12	10	8	3	0	4.04	1.96
creativity	6	12	6	14	13	9	12	7	2	4.70	2.20
learning	5	11	10	5	12	16	11	6	4	4.94	2.24
family-oriented	14	0	7	9	5	11	13	15	6	5.38	2.64
inspiration	0	3	3	5	5	4	22	23	15	6.98	1.86
community	0	2	0	1	4	8	4	17	44	7.91	1.63

Moreover, that "family-oriented" and "community" were both ranked low by caregivers suggests that they are more interested in their children's physical engagement with exhibit environments and materials than socially interactive and joint children's museum engagements. However, the social situation of a visit significantly influences visitors' museum experiences (see section 'Visitor Experiencescape: Social Situation' in Chapter Three; see section 'The Social Situation' in Chapter Seven). Notably, a subset of participants ranked "family-oriented" as the most important reason for a children's museum visit. These caregivers may be more inclined to (inter)act with(in) their children and the museum during family visits. It would be of great interest to collect a larger sample to further investigate differences between those who do feel that being family-oriented is an important reason to visit children's museums and those who do not. These insights could be valuable for children's museum practice generally, and also for enhancing creativity in particular, as caregivers' behaviours significantly influence their children's creativity during family visits (see Chapter Seven).

Finally, caregivers rank "inspiration" substantially lower than its frequency ranking in mission statements. This suggests an area for future attention that may have implications on creativity during family visits, as both children's museum mission statements and museum professionals relate inspiration to children's creativity (see Chapter Five, Kupiec, 2024; see Chapter Seven).

These findings have identified general areas of caregiver-children's museum misalignment and, as such, provide initial insight as to why caregivers might be mind-off and/or hands-off during children's museum family visits. To explore caregivers' beliefs and expectations further, findings in Table 8.2 and Table 8.3 show what caregivers think are the most important things about a children's museum visit and the adult's role during it.

The results in Table 8.2 show how important caregivers feel various elements of a children's museum visit are. Reflecting consistency with the findings of term ranking above and further highlighting a significant area of caregiver-children's museum misalignment, caregivers feel the socially interactive aspects of a children's museum visit are the least important, with only six total selections across within-group, museum staff, and other visitor interactions. On the other hand, 75% of participants (n = 61) chose "being hands-on/interactive" as one of the top three most important things about a children's museum visit. These findings further support shifting from an approach to museum learning framed

by sociocultural theory to one framed by Social Learning Theory, which was presented in Chapter Three (see section 'Fit of Applying Social Learning Theory'). More than half of caregivers reported that "having fun" and "having a variety of exhibits and materials to choose from" are important to the visit. Though caregivers might not prioritise creativity as highly as other reasons to visit a children's museum, this suggests that they prioritise aspects of the visit that may contribute to creativity, including affective-conative states, free choice, and a variety of experiences (see Chapter Six).

Table 8.2

Caregivers' Beliefs of the Most Important Things About Children's Museum Visits

Children's museum visit element item	Count	Overall percent	Percent of the sample
Being hands-on/interactive	61	25%	75%
Having fun	50	21%	62%
Having a variety of exhibits and materials to choose from	44	18%	54%
Being a comfortable space, such as being safe, easy to navigate, or not too crowded or noisy	35	14%	43%
Doing something new or that couldn't be done elsewhere	34	14%	42%
Having a positive atmosphere, such as feeling welcoming, inclusive, or non-judgmental	13	5%	16%
Talking together as a group/family	5	2%	6%
Interacting with museum staff	1	0%	1%
Playing with other visitors	0	0%	0%

Despite the findings thus far highlighting that caregivers may believe the physical environment is more important than the social situation during children's museum visits, and that they may also be more concerned about their *child's* engagement than their own, caregivers play an influential role in their children's experiences. The results in Table 8.3 offer important insights into which roles caregivers feel are most important for adults to fulfil during children's museum visits.

Table 8.3

Caregivers' Beliefs of the Most Important Adult Roles During Children's Museum Visits

Adult role item	Count	Overall percent	Percent of the sample
To supervise their child, such as their child's behavior or for their child's safety	53	22%	65%
To step back, allowing their child the freedom to do their own thing without any interference	47	19%	58%
To watch their child as a way to learn about their child, such as their child's interests or the ways their child learns	38	16%	47%
To learn new knowledge alongside their child	29	12%	36%
To encourage or prompt their child's engagement	28	12%	35%
To join in their child's play as a playmate, following their child's lead	23	9%	28%
To serve as a teacher for their child, such as explaining concepts, modeling how to use materials, reading signs, or helping complete difficult tasks	23	9%	28%
To direct or guide their child in order to move the visit along	1	0%	1%
To have a moment to themselves, such as to rest, explore by themself, or check their phone	1	0%	1%

Further supporting their prioritisation of child-environment interactions over social interactions, the three adult roles that caregivers selected as most important (i.e., supervising, stepping back to allow freedom, watching their child) suggest that caregivers believe it is important to be attentive to their children's engagements but not necessarily involved in their activities. In particular, the findings show that caregivers believe the most important adult role is to supervise their children. However, evidence suggests that supervisory roles often reflect mindless engagement, which tends to hinder children's creativity (see Chapter Seven). In fact, children's creativity is more likely to decrease with surveillance but increase when there are fewer rules or when rules are replaced by values (Amabile, 1989; Dacey, 1989, as cited in Epstein, 2019). That safety during engagement matters to caregivers, while Study 2 (see Chapter Seven) found that museum professionals believe their spaces are already designed to be safe and, thus, do not believe that safety needs to be a caregiver concern, reflects a similar misalignment reported by Knutson et al.

(2011) between children's museum professionals' and caregivers' perceptions of safety. Safety concerns can at times lead to caregivers' intervening with mindless engagement (see Chapter Seven). On the other hand, that caregivers believe the next most important adult roles are to allow their children choice and autonomy and to watch their child to learn about them reflects mindfully disengaged behaviours, which are likely to enhance children's creativity (see Chapter Seven). In fact, evidence suggests that creativity increases with more autonomy and choice and less imposed control (e.g., close monitoring, excessive time pressure) during activities, even if goals are pre-determined (Amabile, 1998; Byron & Khazanchi, 2012; Keith & Jagacinski, 2023). Additionally, learning about their children's interests can aid caregivers in providing future creativity-enhancing experiences by supporting children's engagement in personally interesting activities outside of the museum (see Chapter Six; see Chapter Seven).

In order of selected importance, the next cluster of roles centre on caregiver-child interaction: adults learning alongside their child, prompting their child, joining in child-directed play, and serving as a teacher for their child. Thus, despite placing low value on social interactions overall, adults do feel a moderate level of responsibility to be hands-on. However, findings show that caregivers vary in *how* they believe adults should be hands-on. Whether the role is more for prompting or playing together may have implications on whether creativity is experienced by children individually or as group creativity (see section 'Group Creativity' in Chapter Six). Lastly, that caregivers value standing back and learning *about* more than learning *with* their children supports the proposal in Chapter Three (see section 'Roles') that museum learning differs for children and adults and, thus, it is necessary to simultaneously consider the visiting family as having a group experience *and* children and caregivers as having individual experiences.

Finally, the least important adult roles are guiding the visit itself and having a moment to themselves, with only one selection each. This finding contrasts with what museum professionals describe happening in museum exhibits (e.g., caregivers taking over an activity, caregivers rushing their children to the next exhibit, caregivers sitting off to the side and using their cell phones: see Chapter Seven), indicating a potential within-caregiver discrepancy between beliefs and behaviours. This suggests another area for future research.

While a wealth of research to date has explored museum visit motivations and expectations, including the impacts these have on engagement and learning (see section

'Why?' in Chapter Two), less has explored potential (mis)alignment between caregivers' priorities, expectations, and beliefs and those of children's museum institutions and museum professionals. Despite caregivers reporting a relatively strong sense of familiarity with what children's museums are, the present findings indicate significant areas of misalignment between their perceptions and those of children's museum institutions (see Chapter Five, Kupiec, 2024) and museum professionals' (see Chapter Seven), which are likely to impact children's experiences, including creativity. By positioning the children's museum as a place for family interactions, emphasising generativity in addition to engagement, and addressing caregiver-children's museum misalignment regarding caregivers' roles, caregivers may be better supported to enact mind-on behaviours that contribute to maximising children's creativity during family visits.

Caregivers' Beliefs about Children's Museums' Opportunities for Creativity

RQ10: What do caregivers of children aged 5–8 years believe about children's museums as an opportunity for creativity?

The findings presented in Table 8.4 suggest that caregivers believe children's museums offer an opportune context for children's creativity and the range of ways in which children might engage in and express their creativity. However, while they report that they would feel at ease playing with their children, caregivers were less likely to agree that it would be their job to support their children's creativity. That caregivers report they would feel comfortable playing with their children conflicts with prior explanations offered by researchers to explain differences in parent interaction styles between the home and museum contexts, such as lack of comfort and privacy (e.g., Shine & Acosta, 2000). That caregivers do not feel it is their responsibility to support their children's creativity further supports the findings above that caregivers may not perceive the children's museum as a place for them to engage, but rather as a place intended for child-only engagement.

Findings further show that caregivers are less likely to view the children's museum as a place that has creative opportunities for *adults* than for children. However, adults' modelling of and engagement in creativity are important creativity-enhancing behaviours for both children's individual creativity and group creativity (see Chapter Six; see Chapter Seven). Moreover, though these findings are unsurprising in light of evidence that caregivers may not recognise the children's museum as a place for family and adult engagement more generally (see above), findings in Chapter Seven suggest that museum professionals want to

remind adults that they can be creative too and that, for instance, materials and ideas that remind caregivers of their own childhoods tend to support their engagement and creativity. In fact, undergraduate students scored higher in originality on a creativity assessment taken after completing a writing exercise asking them to imagine themselves as a 7-year-old (Zabelina & Robinson, 2010). Rather than focusing on caregivers' comfort with engaging in play, these findings suggest that children's museums might more effectively support caregivers' recognition of and engagement with creative opportunities by eliciting their playful mindsets.

Table 8.4

Caregivers' Beliefs About the Opportunities for Creativity During Children's Museum Visits

Creativity-related opportunity statement	Mean
Opportunity for children's creativity	
Children's museums are a good environment for children to be creative.	1.13
There are many different ways for children to be creative at a children's museum.	1.07
Opportunity for caregivers' creativity	
I would feel at ease playing with my child at a children's museum.	1.09
It would be my job to support my child's creativity during a children's museum visit.	0.64
There are plenty of opportunities for adults to support children's creativity at the children's museum.	0.65
It's hard for adults to be creative at children's museums.	-0.64
Children are most creative without any adult involvement.	0.10
Engagement opportunity for creativity	
It's important to visit all of the exhibits at a children's museum during each visit.	-0.45
There is a right way to play at children's museums.	-0.72

Interestingly, caregivers are relatively neutral on whether children are more or less creative with adult involvement. This indicates alignment with museum professionals, who believe that it depends on the *type* of involvement (see Chapter Seven), as well as with evidence suggesting that the adult's *role* during play impacts creativity (e.g., Lillard et al., 2013; Mellou, 1995; Pellegrini & Greene, 1980; Tok, 2022). Further exploration is warranted

to better understand the nuance of caregivers' perceptions of adult involvement on children's creativity, and whether these inform if and how they interact.

Lastly, caregivers do not believe it is important to see all the exhibits during each museum visit or play in a particular way at children's museums, suggesting that they are mindful about engagement conditions that can enhance creativity. However, this contrasts with findings from Study 2 (see Chapter Seven), in which museum professionals reported that caregivers sometimes rush their children and sometimes complete parts of an activity themselves instead of allowing their children to (i.e., mindless engagement behaviours). Thus, future work is needed to explore how general children's museum engagement beliefs might link to, and influence, caregivers' creativity beliefs and in-museum behaviours.

Together, these findings indicate that it might be less that caregivers do not know how to enact creativity-enhancing mindful behaviours with their children, and more that they may benefit from support in recognising the children's museum as an opportunity for them to do so.

Caregivers' Creativity Understandings

Defining "Child Creativity"

RQ11: How do caregivers of children aged 5–8 years define child creativity?

Caregivers' definitions of "child creativity" varied widely. Of note, it is possible that the museum-focused survey may have influenced some participants' definitions, as a few provided examples of child creativity in relation to children's museum exhibit engagement.

Nearly all caregivers' definitions acknowledged creativity as condition-dependent. Caregivers significantly believe that child creativity necessitates permission to be creative, particularly through being *allowed* by adults. This illustrates that caregivers are concerned with removing what might hinder creativity, supporting the argument that children's creativity may rely heavily on allowing them time and space to be creative and removing circumstantial constraints (see section 'Spontaneity and Serendipity via Engagement, but Not Luck' in Chapter Six). Moreover, caregivers did not simply define creativity as child-led or child-directed, but also, at times, *child-only,* specifying that adult interaction simply serves to hinder creativity. Thus, it is essential to support caregivers in understanding that caregiver engagement, if mindful, can *enhance* children's creativity. Additionally, caregivers noted the significant importance of the physical environment through materials and tools, particularly those that are safe.

Nearly all caregivers also characterised child creativity as a process or an engagement, primarily as play, hands-on manipulation with materials, exploration, and *using* imagination. In addition to engagement, and thus recognising that creativity is an experience (see section 'Experience' in Chapter Three), approximately half of caregivers' definitions acknowledged the generativity of creative expression by defining child creativity as making or creating something. When this was qualified, it was typically in terms of being new or different, with a few caregivers further specifying that new only had to be *to the child.*

More than a third of caregivers defined child creativity as individually unique and personally experienced, including as being related to personal interests, arising from an individual's unique perspective, and depending on individual emotions and personality. Moreover, and highlighting the individuality of experience, caregivers recognised that there are multiple ways of being and expressing creativity. When specified with examples or lists of creative activities, caregivers primarily identified pretend and imaginary play, art, movement and physical play, problem solving, and storytelling. Together, these findings suggest that caregivers neither believe creativity is limited by domain nor that all children will be creative in the same ways.

Whereas museum professionals did not typically recognise creativity as a mediator (see Chapter Seven), nearly half of caregivers did. In fact, they noted several outcomes of creativity, mainly learning, having fun, and expressing or learning about oneself. Moreover, though identified in only six definitions, a notable theme is child creativity as a form of self-actualisation. This aligns with Maslow's (1993) belief regarding the close relationship between creativity and self-actualisation (see section 'The Distinct Contribution of Each Component to Creativity as a System' in Chapter Six), supporting creativity's contribution to children's holistic development. Together, these findings suggest that caregivers would likely be motivated to have their children engage in creative experiences.

Nearly half of caregivers defined creativity in terms of a cognitive element (e.g., an ability, thinking, ideas). There was significantly less mention of affective-conative states, suggesting that caregivers may believe that, if given environmental opportunity, children can simply apply their creative ability. This suggests a potential area for supporting caregivers' understandings of child creativity. Notably, eight participants recognised child creativity as an integration, including of their "inner thoughts and outer world".

Interestingly, creativity was not only defined as individually experienced, but largely as individual. Rarely were other children mentioned, suggesting a limited understanding of child creativity in "group creativity", which might influence creativity in the public space of the museum. Few caregivers compared child creativity to adult creativity, but when they did, it was typically to highlight difference, suggesting an understanding of creativity as growth-oriented. Finally, while not exploring what caregivers believe *nurtures* children's creativity, a few participants defined child creativity as coming from, and *benefitting* from, new experiences.

Information, Motivation, and Behavioural Skills

RQ12: What degree of creativity-related information, motivation, and behavioural skills do caregivers of children aged 5–8 have?

Caregivers' creativity-related information score had a mean of 0.52 (*SD* = 0.74). A Shapiro–Wilk normality test was statistically significant (W = 0.96, p = 0.007), with the distribution's kurtosis = 2.40 and skewness = 0.34.

Caregivers' creativity-related motivation score had a mean of 0.95 (*SD* = 0.62). A Shapiro–Wilk normality test was not statistically significant (W = 0.97, p = .06), with the distribution's kurtosis = 3.12 and skewness = -0.40.

Caregivers' creativity-related behavioural skills score had a mean of 0.54 (*SD* = 0.62). A Shapiro–Wilk normality test was statistically significant (W = 0.95, p = 0.002), with the distribution's kurtosis = 3.19 and skewness = 0.74.

A one-way repeated-measures ANOVA was conducted to compare scores across caregivers' information, motivation, and behavioural skills. There was a significant effect of caregivers' understanding category on scores ($F(2, 237) = 13.48$, $p < .001$). Post hoc comparisons using Estimated Marginal Means revealed that caregivers' motivation score was significantly different from both their information ($p < .001$) and behavioural skills scores ($p < .001$). There was no significant difference between their information and behavioural skills scores ($p = 0.82$).

These findings suggest that caregivers do feel a high level of motivation towards creativity—they view it as a beneficial competency that is valuable to spend time on, and they want their children to have creative opportunities, including by providing and encouraging these opportunities themselves. However, while caregivers have a positive degree of understanding of creativity as a construct (i.e., information) and of knowing how

and feeling capable to support their children's creativity (i.e., behavioural skills), these might be less than enough to fulfil their significantly higher level of motivation. To better inform specific areas where caregivers may most benefit from support, all items with a mean below 0.5 were examined (see Appendix M, Table M1 for the mean of all IMB statements). These included five information and four behavioural skills items but, as expected, zero motivation items (see Table 8.5).

Table 8.5

Items Suggesting Where Caregiver Support May be Most Beneficial (mean < 0.5)

Creativity-related understanding statement	Item score transformations	Mean
Information		
Creativity doesn't take much time—it happens in a lightbulb or 'aha!' moment.	Reverse coded	-0.24
The more experience someone has with an activity or subject, the more creative they can be in it.	Reverse coded	0.12
To be creative, effort is more important than natural talent.		0.14
If someone is really creative in one area of their life, they will be more creative in all areas.	Reverse coded	0.18
Creativity might happen in other subjects or during other activities, but art is the most creative.	Reverse coded	0.39
Behavioural Skills		
I don't always know how to best support my child in expressing their individuality.	Reverse coded	0.20
I know questions I can ask my child to help them think from different perspectives or of different possibilities.		0.46
I am a creative person.		0.49
I feel confident expressing my own creativity.		0.49

The biggest misunderstanding of creativity-related information, and, notably, the only item with a negative mean after the data was recoded, lies in caregivers' belief that creativity happens quickly. Similarly, caregivers had very low agreement that *effort*, which necessitates time, is more important than natural talent. These findings are of particular interest for creativity in the context of children's museum family visits because evidence

suggests that caregivers often rush their children from one exhibit to the next, even when they are engaged in a self-chosen activity, and that children themselves feel rushed during their museum visits (Archer et al., 2016; Lewin, 1989; Piscitelli & Anderson, 2001; see Chapter Seven). However, creativity is an experience that requires engagement and, thus, time and effort (see section 'Creativity Unfolds Over Time' in Chapter Six). Although caregivers do not feel it is important to visit all of the exhibits at a children's museum in a single visit (see above), that the link between engagement and creativity might be misunderstood could potentially lead to ill-timed, creativity-stifling interruptions. Furthermore, allowing longer task engagement could contribute to increased positive emotions and creative confidence beliefs (Karwowski et al., 2019), which is especially important because children's creativity may be particularly influenced by their affective-conative states (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components' in Chapter Six), and childhood may be a critical period in which to support individuals' creative self-beliefs (see section 'Critical Developmental Period in Childhood' in Chapter Six).

The next lowest agreement concerns how an individual's prior experience relates to the degree of their creativity. This finding is not unexpected given that a balance between new exposures and expertise supports creativity (see Chapter Six). Further, museum professionals report that both familiar and novel themes and materials support children's creativity and that creativity can increase with repeat visits (see Chapter Seven). However, children's museum professionals also believe that children's museums are unique from other places in children's lives and offer experiences that visitors could not have elsewhere (see Chapter Seven), and 42% of caregivers feel that "doing something new or that couldn't be done elsewhere" is one of the three most important things about children's museum visits (see section 'Visit Expectations and Caregiver Roles' above). As a result, caregivers may benefit from guidance that helps them recognise the creative potential of unique museum offerings and supporting their children's engagement with novel exhibit themes and materials.

Although caregivers believe that there are a variety of ways to be creative and recognise that children's museums have opportunities to be creative in many different ways (see above), these findings suggest that they might hold some misunderstandings about the domain generality versus specificity of creativity (also see section 'Responsivity to Engaged

Activity, but Forgoing a Component of Task and Domain' in Chapter Six). Firstly, findings indicate that, to an extent, caregivers believe that creativity is domain general, such that they may perceive some children as naturally more creative in all areas, rather than recognising and supporting each child's individual creative strengths (see section 'Individual' in Chapter Six). Secondly, findings suggest that, to a degree, caregivers believe that art-related activities are the most creative, a common creativity myth (Robinson, 2009). This misunderstanding could be problematically reinforced by explicitly "creativity" titled museums spaces that narrowly focus on art (see Chapter Seven). As a result, though caregivers agree that creativity is for everyone and malleable, they may not recognise opportunities for creativity depending on their prior beliefs about their children (i.e., visitor portrait factors) and an exhibit's theme and materials (i.e., physical environment factors), which could influence their behaviours and whether or not these are mindful (i.e., how they contribute to their children's social situation). Because not all children will express their creativity through art, this is particularly important when considered alongside the behavioural skills finding that caregivers report having less skill in knowing how to support their child in expressing their individuality. It may be beneficial to support caregivers in recognising that creativity may require different types and amounts of support across exhibits.

In addition to identifying a couple of specific behaviours that caregivers would most benefit from having targeted guidance (i.e., supporting their child in expressing their individuality and helping them think from different perspectives or of different possibilities), findings from the behavioural skills items suggest that caregivers have low creative self-efficacy and creative confidence. While unsurprising given evidence suggesting that adults have greater anxiety during creative tasks than non-creative tasks (Daker et al., 2020), this suggests that caregivers may not only have low creative self-efficacy in the context of the public children's museum visit, but generally. However, both modelling creativity and engaging in creativity alongside and with children are important for enhancing children's creativity, including in children's museums (see Chapter Six; see Chapter Seven). Therefore, although creative self-efficacy is situationally specific (Karwowski et al., 2019), it may be more important to help caregivers perceive themselves as creative, regardless of the context (i.e., support their creative identity). These findings suggest that intervention efforts must move beyond simply orienting caregivers to recognising the children's museum as

having opportunities that invite their creativity, which might counterproductively heighten negative affective-conative states (e.g., creative anxiety), thereby reducing their creative engagement, and must instead first help them recognise themselves as creative.

The present findings suggest that caregivers value creativity; however, while they recognise the children's museum as an opportunity for *children* to be creative, they do not necessarily view the visit as an opportunity to be creative themselves or a place for them to facilitate their children's creative engagements. The findings further suggest that, even if the opportunity is made more transparent in a way that invites their mindful participation, caregivers might not have sufficient creativity-related information understandings and behavioural skills to successfully step into this role. Despite some of the present findings aligning with what museum professionals already notice and believe about caregivers' mindless behaviours during family visits (e.g., caregivers supervising their children rather than playing together, caregivers not always engaging in creativity themselves), the field does not yet have an effective way to orient caregivers and support them in enacting creativity-enhancing mindful behaviours (see Chapter Seven). The next set of items sought to explore how caregivers might accept an intervention with these aims.

Caregivers' Creativity-Related Intervention Acceptability

RQ13: What type of intervention might caregivers of children aged 5–8 years most accept in supporting their children's creativity?

While zero caregivers strongly disagreed and six disagreed with wanting to learn more about child creativity, 57 agreed and 18 strongly agreed (M = 0.65, SD = 0.53). This suggests that caregivers would likely be open to a creativity-related intervention. However, that the level of agreement is moderate accentuates the importance of framing any intervention in a way that caregivers find acceptable, as acceptability encourages both intervention engagement and the intention to utilise behaviours inspired by it (Casale et al., 2023). The next set of findings illustrate what and how caregivers would most like to learn about creativity.

The findings presented in Table 8.6 suggest that caregivers are most interested in learning about strategies they can use to support their children's creativity (i.e., behavioural skills), followed by when to use these and what other conditions may impact their children's creativity (i.e., opportunity and information). While equipping caregivers with creativity-related behavioural skills and information is a promising starting point for intervention, this

itself might not be enough. Findings above show that caregivers do not feel their engagement is particularly important during children's museum visits and do not recognise the children's museum as a place for *them* to be creative alongside and with their children. This suggests that it is imperative for any creativity-related intervention to not only provide creativity-related understandings, but also emphasise opportunities for caregivers to utilise them during children's museum family visits (Casale et al., 2023).

Table 8.6

Caregivers' Rankings of What They Would Most Like to Learn More About Child Creativity

What to learn	Count of each rank					Mean rank	Standard deviation
	1	2	3	4	5		
Strategies I can use to best support my child in being creative	50	17	10	4	0	1.60	0.89
When I can most appropriately support my child's creativity	13	31	22	12	3	2.52	1.05
The conditions that impact child creativity	6	28	36	2	9	2.75	1.03
What child creativity is	11	1	4	33	32	3.91	1.32
Why child creativity matters	1	4	9	30	37	4.21	0.92

Table 8.7

Caregivers' Rankings of How They Would Most Like to Learn More About Child Creativity

How to learn	Count of each rank						Mean rank	Standard deviation
	1	2	3	4	5	6		
Watching others successfully support child creativity	24	18	21	6	9	3	2.59	1.46
Talking with someone who has expert knowledge	27	21	8	10	3	12	2.72	1.78
Watching a video	14	21	20	9	13	4	2.98	1.47
Reading a handout/pamphlet	10	9	11	25	15	11	3.73	1.54
Reading a sign/poster	2	6	13	18	30	12	4.28	1.26
Receiving a text	4	6	8	13	11	39	4.70	1.56

On the other hand, learning more about what child creativity is (i.e., definition and information) and why it matters (i.e., motivation) are much less important to caregivers. These findings suggest that caregivers are willing to accept personal, implicit definitions of child creativity and that they recognise they do not need motivation support, reflecting the above findings that caregivers already have a high level of creativity-related motivation.

In addition to what intervention content would most likely benefit and be accepted by caregivers, it is important to understand *how* they may be most receptive to receiving it. The findings presented in Table 8.7 suggest that caregivers would most like to learn about child creativity by watching others support it, talking with an expert, or watching a video (i.e., experiential approaches). These ways of learning from others support the application of a Social Learning Theory approach to children's museum family visits, which was presented in Chapter Three (see section 'Fit of Applying Social Learning Theory'). Much less desirable are reading a handout/pamphlet, reading a sign/poster, and receiving a text (i.e., passive approaches). These findings illustrate alignment with children's museums' current practices, as children's museum professionals report using written materials (e.g., signage) less often because they find them less effective, while they find that staff facilitation is a more promising approach to support visitor engagement and caregiver interaction (see Chapter Seven). However, findings from Chapter Seven also suggest that more direct support than implicit facilitator modelling may be helpful, such that future interventions might be most effective if they are explicitly and instructionally informative.

As the findings above indicate that caregivers do not feel that interacting with museum staff is important during children's museum visits, the fact that they do not rank watching a video substantially lower than watching others or talking with an expert, but considerably higher than written materials, suggests that videos may hold great promise. In fact, although technology is not often employed in children's museums (see Chapter Seven), caregiver-directed videos have shown effectiveness in the museum context during family visits (van Schijndel et al., 2010). Additionally, videos offer an avenue for intervention that is better aligned with the implementation science constructs of scalability and fidelity, while remaining sensitive to feasibility concerns, such as staff availability and training (Halle et al., 2013; Mayfield, 2005; see Chapter Seven). It is evident that caregiver-directed videos warrant future investigation in children's museums.

Limitations and Future Directions

This chapter has argued that wise interventions and the IMB model hold great potential for supporting museum visitors' experiences, particularly through focusing on caregivers in the context of children's museum family visits. Future work in the field should explore the potential benefits of museum practice informed by these approaches. However, wise interventions "allow people to draw new conclusions on their own" (Walton & Wilson, 2018, p. 624), and the pathways of the IMB model can be moderated by situational and individual factors (Fisher et al., 2003). Thus, it is essential that these approaches be applied thoughtfully and that elicitation research and intervention work is conducted with representative and diverse samples. As such, the most notable limitation of the present study is the small, homogenous sample.

As only four participants and their 5–8-year-old children had not been to *any* type of museum in the past year, those who have interest in and visit museums might have been more willing to complete a museum-related survey, despite best efforts to distribute the survey widely and recruitment materials explicitly stating that participants "do *not* need to have visited a children's museum before." Moreover, despite conducting cognitive interviews to support survey development and item refinement, it was evident from the data that the survey itself had limitations in reliably capturing *children's museum* visitation habits. However, evidence suggests that museum visitors differ from nonvisitors and that occasional visitors differ from frequent visitors (see section 'Who?' in Chapter Two; see section 'Mobilising Caregivers' above), and each museum experience—including engagement styles, family interactions, and creativity—is influenced by factors of the visitor portrait (see section 'Visitor Experiencescape: Visitor Portrait' in Chapter Three; see Chapter Seven). In fact, children's museum professionals report differences in caregivers' behaviours and roles in response to visitor portrait factors, including museum familiarity and caregivers' understandings of children's museums (see Chapter Seven). Finally, children attending schools following different pedagogical approaches score significantly differently on creativity tests (see section 'Experience-Dependent and Opportunity-Linked' in Chapter Six). However, little is known about whether their caregivers, whose beliefs may influence which school they enrol their children in, hold different creativity-related understandings, and, thus, whether caregivers may be an important confounding factor in child-school creativity

findings. Because the present sample did not allow for meaningful comparative analyses, future research with larger samples is needed to investigate RQ14.

Future work with diverse samples is also an essential next step of the present elicitation research because the effectiveness of a wise intervention may depend on the level at which vulnerabilities are present, such that its affordances and impact might differ across groups and/or individuals (Walton & Yeager, 2020). There is evidence to indicate that this consideration is particularly relevant for the current study. Present findings may not be as helpful for supporting those who are from nondominant communities and for whom museum-going is not part of their family practice (see Chapter Three; e.g., Archer et al., 2016; Moussouri, 2024; Weiland, 2015). For example, findings show that "having a positive atmosphere, such as feeling welcoming, inclusive, or non-judgmental" is of relatively low importance to caregivers; however, prior work has suggested that those who do not have museum familiarity value feeling comfortable and at ease in the places they choose to spend their leisure time (Hood, 1983/2007; see section 'Who?' in Chapter Two). In addition, prior work suggests that caregivers from diverse socio-cultural backgrounds may hold different beliefs about whether and how adults should participate in their children's play during museum visits (see section 'Equity' in Chapter Three). Moreover, individuals from different cultures conceptualise creativity differently (Sawyer, 2012), including in their implicit theories of children's creativity (Runco & Johnson, 2002). As a result, to remain psychologically wise to all visitors, caregivers from diverse backgrounds may optimally benefit from different intervention foci. Resource-based interventions (i.e., videos) offer less personalisation compared to facilitation, which might limit their effectiveness, particularly with more diverse samples. The present findings may, therefore, be limited in their applicability and, if not interpreted and implemented with reflective and careful consideration, the interventions they contribute to informing could risk perpetuating existing tensions (see section 'Tension' in Chapter Three), and future work is needed.

This study has provided valuable insights into caregivers' understandings of creativity-related information, motivation, and behavioural skills. However, the significance and strength of the causal pathways of the IMB model differ between applications and populations (Fisher et al., 2003). Thus, a next step to support intervention development could be to implement the present survey items exploring information, motivation, and behavioural skills understandings alongside observations of caregivers' behaviours during

children's museum family visits in order to perform structural equation modelling, in alignment with the IMB behaviour change model.

While some evidence suggests that caregiver-reported beliefs are consistent with their behaviours in the museum context (e.g., Swartz & Crowley, 2004), other evidence suggests an inconsistency between their beliefs and their enacted roles (e.g., Downey et al., 2010). Observations could also offer deeper understandings of the within-caregiver discrepancy identified through this work between caregivers' intentions, as reported in this study, and their actual behaviours, as described by museum professionals (see Chapter Seven); how intervention acceptability, intention, and opportunity relate to caregivers' behaviours (Casale et al., 2023); and how child factors might moderate the link between caregivers' intentions and behaviours, as well as interact with and mediate the influence of caregivers' behaviours on children's creativity. In addition, a larger sample size would allow for cluster analysis to examine whether there are patterns or groupings in the data. As the findings presented in Chapter Seven identified four quadrants of caregiver behaviours during children's museum family visits, it may be valuable to identify possible clusters reflecting caregivers' creativity-related understandings and explore whether these map onto their observed behaviours and roles during children's museum visits. As children's museums do not currently have a way to measure child creativity (see Chapter Seven), it is also unlikely that they have a way to measure caregiver creativity-related behaviours. Therefore, an imperative next step of this work is to develop a child creativity and caregiver creativity-related behaviour observational tool.

Prior work framed by the IMB approach has problematically used caregiver information, motivation, and behavioural skills in a model directly influencing *child* behaviour (e.g., Sinley & Albrecht, 2018; Goodell et al., 2012). Instead, the present application of the IMB model reflects the initial potential to change *caregiver* behaviour that could, in turn, influence children's behaviour. A change in any element of an experience changes the experience as a whole, but some experience factors might be more influential than others (Rossman & Duerden, 2019). While findings in Chapter Seven indicate that supporting caregivers' mindful behaviours would likely enhance children's creativity, future research is necessary to investigate not only whether an intervention informed by the present findings could effectively change caregivers' behaviours, but also whether, how, and how much it changes children's creativity. Future research should also examine whether

caregivers' enacted behaviours change in variety and/or frequency; explore the flexibility of their behaviours in response to environmental and child factors, including whether and how caregivers responsively balance mindful engagement and mindful disengagement; compare effects between exhibit types (e.g., art studio versus pretend play), applications of creativity (e.g., self-expression, problem-solving), and communicative manifestations of children's creative expressions (e.g., behavioural action, material representation, verbal description); and investigate the extent to which intervention supports caregiver-supported children's creativity versus families' group creativity.

Finally, much of the current research on enhancing children's creativity has been conducted in classrooms and school contexts. Although prior work has suggested that implicit theories about children's creativity do not differ between parents and teachers (Runco & Johnson, 2002), this work further extends findings from Chapter Seven that children's museum experiences have unique creativity-related obstacles. For instance, the present findings suggest that caregivers view the children's museum as offering opportunities for children's creativity and have high creativity-related motivation; however, they may not perceive the children's museum as a place to enact creativity-enhancing behaviours or have sufficient creativity-related information and behavioural skills to do so. This differs from the challenges that teachers report facing, including time and testing constraints that make it feel more important to quickly cover the curriculum (i.e., low motivation) and a lack of skills and supportive professional development (i.e., low behavioural skills), which may limit their implementation of creativity-enhancing practices despite having appropriate and accurate information understandings (e.g., Al-Abdali & Al-Balushi, 2016; Harris & de Bruin, 2018). Therefore, it is important to continue examining creativity in context, including in children's museums.

Conclusion

Findings from Study 2 (see Chapter Seven) suggest that children's museums generally have many elements of creativity-enhancing environments and offer opportunities for visitors to be creative across diverse domains, interests, and materials. However, akin to Broadway being dark without actors to bring the stage to life, museum experiences and learning are determined by visitors and their visiting groups (inter)acting with(in) the museum. As such, caregivers' behaviours have a significant influence on their children's experiences. In fact, both the Visitor Experiencescape and CLOVER include physical *and*

social factors, such that considerations of each must be made to maximise children's creativity during children's museum family visits.

Although a wealth of literature shows that caregivers in family groups often report visiting museums for their children, to support their children's learning, and to bond with their children, findings from Study 2 suggest that they might not engage mindfully *during* the visit, potentially hindering their children's creativity. Museum efforts can effectively support caregivers during family visits. The present elicitation research has explored how to optimally support caregivers through a wise intervention approach that applies the Information-Motivation-Behavioral Skills model for behaviour change. Findings suggest promise for children's museums' efforts that support caregivers in recognising the children's museum as an opportunity for them to facilitate their children's creativity and to be creative alongside and with their children. Further, findings suggest that these efforts might be most accepted and effective when delivered through personal interactions or videos that highlight information about the conditions that support children's creativity and that demonstrate and teach about creativity-related behavioural skills. Taking into account constructs from implementation science and findings that caregivers do not prioritise interacting with others during their children's museum visits, museum efforts should prioritise exploring the potential of videos. While this study offers important insights that can contribute towards informing children's museum design and practices, future work is needed, particularly research with more diverse samples and the development and implementation of an observational tool that can assess both child creativity and caregiver creativity-related behaviours and roles.

Chapter 9

Discussion

Contributions of the Thesis

Through critical theoretical and conceptual review and empirical research and analysis, this thesis makes several key contributions to the fields of visitor studies and creativity, spanning theory, knowledge, practice, and methods. It is necessary to first highlight the main theoretical and conceptual contributions before moving to the discussion of the empirical work and, thus, the contributions to knowledge and practice, as "the theories that 'circulate' in educational practices also play an important mediating role in the uptake of insights from research" (Biesta et al., 2011, p. 234-235).

Contributions: Theory

In response to fields that are rapidly expanding in, at times, disparate directions, the approach to literature review has been one of critical theoretical and conceptual review. According to Torraco (2016), "critical analysis of previous research identifies areas in which new knowledge is needed; synthesis builds on this by creating new models and ways of thinking about the topic" (p. 421). As such, this approach was able to identify the ways in which the visitor studies field could be supported with contemporary language for discussing museums, their exhibits, and visitor learning, particularly in relation to children's museums (see Chapter Two). Furthermore, it was apparent that a re-examination in how these components fit and function together was needed, leading to refinement and extension of the CML as the Visitor Experiencescape, the conceptual distinction between child and caregiver roles during family visits, and Social Learning Theory as a theoretical underpinning beneficial for framing museum experiences and learning (see Chapter Three). In the field of creativity, review identified the need for a growth-oriented perspective and, through a synthesis of current creativity models, the CLOVER brings cohesion to the numerous distinct yet valuable approaches across the field (see Chapter Six). Additionally, considering subjectivities and blurred boundaries in defining creativity, a sub-construct of creativity, child creativity, was proposed and defined (see Chapter Six). The great variation found in definitions of "child creativity" within and between museum professionals and caregivers (see Chapter Seven; see Chapter Eight) suggest that this conceptualisation and language hold promise as meaningful contributions in enabling productive discussions.

Language, models, and approaches from across the fields of visitor studies and creativity have been refined, extended, synthesised, and reframed in ways that build on previous work rather than replace it. Exemplifying their conceptual utility by offering more complete understandings, these contributions add to both fields under investigation by unifying debates (e.g., creativity: width of applicability, as opposed to domain general versus specific; experience, as opposed to state versus trait) and providing approaches for closing them (e.g., visitor studies: experience modelling (mis)match, and efficacy in Social Learning Theory for exploring how to reduce mismatch and tension). Further, perspectives have been highlighted that may be more sensitive in their applications to children (e.g., children's museums: defining exhibits by materials rather than objects or artefacts and drawing on reciprocal determinism of Social Learning Theory to be particularly responsive to how children behave and their hands-on material engagements; creativity: a growth-orientation illustrating maturation versus experience, alongside the proposal of a weight difference of the CLOVER's components between children and adults).

Contributions: Knowledge and Practice

Grounded in the theoretical and conceptual foundations established through literature review, the empirical work of this thesis endeavoured to fill gaps of knowledge and support practice. The Visitor Experiencescape and the CLOVER represent, respectively, the museum visit and creativity as experiences (see Chapter Three; see Chapter Six). The conceptualisation of each as an experience not only supports the argument that children's museums are a promising place for creativity (see Chapter Six), but it also offers a link between conceptual understandings and practical applications for enhancing children's creativity during children's museum family visits. The experiential framing supports the development of knowledge by providing a way to (1) understand children's museum design as offering a place of experiential opportunity and (2) model (mis)match in order to identify gaps and investigate how to improve individual-environmental fit. Further, it enables the museum field to draw upon the principles and strategies of experience design to inform practice, including guiding decision-making regarding the approaches and foci implemented to support visitors' experiential engagement.

The next section of this chapter will bring together the findings from the empirical studies of this thesis and illustrate how the work has, through this experience lens, contributed to knowledge and practice. These contributions relate to some of the areas

identified in the *Learning Value of Children's Museums Research Agenda* (Luke & Garvin, 2014), such as determining what factors of a children's museum family visit support and/or hinder creativity (i.e., knowledge), understanding how to better communicate opportunities to caregivers, and identifying strategies that may effectively guide and support caregivers' behaviours (i.e., practice). For instance, this work has contributed to knowledge by distinguishing between the influence of caregivers' attention and their involvement on children's creativity (see Chapter Seven). Focusing on this finding, it has contributed to practice by informing a promising avenue for providing guidance to support caregivers in enacting creativity-enhancing mindful behaviours (see Chapter Eight).

Despite contributions, gaps in knowledge undoubtedly remain, and these limitations will be addressed alongside their potential implications on practice. The present chapter then explores how some of the theoretical and conceptual approaches have been supported and might be usefully applied in future research and practice (i.e., Social Learning Theory, the Visitor Experiencescape, a "seed" versus "soil" approach: see section 'Applying Theoretical and Conceptual Contributions' below).

Contributions Beyond Intended Aims

Methods

Despite not being a primary aim of this work, a few methodological contributions have been made. Study 3 (see Chapter Eight) contributes to methods in two ways: (1) by demonstrating how elicitation research with caregivers framed by the IMB behaviour change model might be used in the field of visitor studies, which also supports the following *Learning Value of Children's Museums Research Agenda*'s item: "What are the most effective strategies for helping children's museums understand parent perspectives?" (Luke & Garvin, 2014, p. 4); and (2) by developing creativity-related information, motivation, and behavioural skills survey items (see Appendix M) to assess caregivers' understandings, though a next step of exploratory factor analysis with a larger sample is needed before these items are used widely. Additionally, findings suggest that children's museums do not have a way to identify and measure creativity in their spaces. To support future evaluation and research, the first steps of developing an observational tool have been taken (see section 'Measuring Creativity During Children's Museum Family Visits' below; see Appendix R).

Hypothesising for the Future

Finally, through the conceptual and empirical work of this thesis, it becomes possible to begin hypothesising about how the impacts of children's museum family visits with caregiver-directed, creativity-related guidance and support might accumulate and compound over time (see section 'From Supporting to Nurturing Creativity' below). These considerations could contribute to future work exploring the long-term impacts of children's museums, including on children, caregivers, and the family group (e.g., family creative practice), as well as differences in museum learning between visitor roles (i.e., children versus caregivers), all of which are identified areas of interest in the *Learning Value of Children's Museums Research Agenda* (Luke & Garvin, 2014).

Designing Creativity-Enhancing Experiences

Through a progressive focusing approach that considered the perspectives of various stakeholders who contribute to and influence children's museum family visits, this thesis sought to answer the following research question: *How can American children's museums optimise their design and practices to maximise their contribution towards children's holistic growth during family visits?* In light of a broadening conception of museum learning, which may be especially impactful for children's museums (see section 'Why?' in Chapter Two), and to narrow the focus of the work on children's holistic growth in a way that would be responsive and relevant to children's museums themselves, rather than introducing another voice (i.e., researcher's voice) with the potential for misalignment of goals and expectations (see section 'Positionality' in Chapter Four), Study 1 (see Chapter Five, Kupiec, 2024) analysed the mission statements of 321 American children's museums and identified creativity as the most prioritised Lifelong Competency.

Museum learning, including creativity, emerges, at least in part, from or in relation to a museum experience (see section 'Museum Learning' in Chapter Two). Chapter Three argued that an essential element of an experience is the mutually (re)defining engagement of an individual with their environment (see section 'Engagement' in Chapter Three), and the Visitor Experiencescape (see Figure 3.2) was proposed to capture this engagement of visitors with informal educational environments, such as museums. Chapter Six argued that creativity is an experience and, thus, depends on both individual and environmental factors, as shown in the CLOVER (see Figure 6.1). While "experience and education cannot be directly equated to each other" (Dewey, 1938/1997, p. 25), through their design and

practices, children's museums can guide visitors' experiences and, to an extent, shape their museum learning, including creativity (see section '(Mis)alignment' in Chapter Three; see section 'Experience Design' in Chapter Three; see section 'Museum Practice' in Chapter Three; see section 'Creativity in Context' in Chapter Six).

An experience defined by an integration that considers displacement of time and context (see section 'Proposing and Defining a Sub-Construct: "Child Creativity"' in Chapter Six), child creativity requires engagement with an internal component, rather than merely resulting from one's immediate external environment, no matter how well designed. However, the exhibit design that best attracts visitors may not be the same as that which can hold their attention and support their engagement (Boisvert & Slez, 1995). Further, "museums seem to be better at creating exhibitions that are strong in engagement than those with meaningful experiences" (Serrell, 2006, p. 67). This may stem from a history of museum research and evaluation that has been driven by a focus on output measures (e.g., visitor demographics, attendance, holding time) (see section 'The Museum' in Chapter One), but it highlights that in order to maximise visitor outcomes, especially children's creativity, museums need to be concerned with not simply whether engagement occurs, but with the type(s) of and quality of visitors' engagement. In fact, "because of the complexity of interacting factors, events produce effects probabilistically rather than inevitably. . . . Most external influences affect behavior through intermediary cognitive processes" (Bandura, 1978b, p. 345). Nonetheless, "the consistent delivery of high-quality experiences requires knowledgeable, intentional experience design" (Rossman & Duerden, 2019, p. 8). To maximise children's creativity, children's museums must offer opportunities for creativity through designing environments that cater to their visitors *and* implementing practices that support their engagement in creative experiences.

Opportunity for Creativity

Environmental Design: Offering a Place to be Experienced

Museums' primary offering is their exhibits (see section 'Where?' in Chapter Two). Findings of Study 1 (see Chapter Five, Kupiec, 2024) show that children's museums intend to achieve creativity goals through design that includes hands-on and interactive elements, family-friendly features, eliciting a positive affect, and experiences that are educational and innovative. Findings of Study 2 (see Chapter Seven) illustrate that, despite creativity not being a starting point for exhibit design in a way that represents institutional priority,

children's museums' exhibits generally include many elements of creativity-enhancing environments (e.g., interactive and hands-on, fun and enjoyable, free-choice and open-ended play, materials unique from home). Moreover, caregivers value creativity-enhancing elements of children's museum visits (e.g., being hands-on, having fun, having a variety of exhibits and materials, being comfortable, doing something new or that couldn't be done elsewhere), and they recognise that children's museums offer diverse opportunities for children's creativity (see Chapter Eight). While mission statements do not indicate facilitation practices (see Chapter Five, Kupiec, 2024) and caregivers do not feel that staff facilitation is important during children's museum visits (see Chapter Eight), Study 2 (see Chapter Seven) found that staff play a meaningful role in supporting children's creativity. Across the studies, findings of this work suggest that children's museums are well-designed environments for children's creativity. As experiential change emerges at the overlap between the individual and their environment, whether the potential of this environmental opportunity is realised depends on visitors being able to tap into it.

User-Centred Design: Potential for Individual-Environment Overlap

Children's museums are museums designed for *who* visits rather than around *what* they collect and display (see section 'Introduction' in Chapter Five, Kupiec, 2024). Promising for enhancing children's creativity, findings suggest that the child is the focus for each stakeholder explored in this work: "child" is the most frequent term in institutional mission statements (see Chapter Five, Kupiec, 2024), children's museum professionals design exhibits *for* children (e.g., ergonomically, for the hands-on ways they engage) (see Chapter Seven), and caregivers both prioritise children's museums for child-museum engagement and recognise that children's museums offer opportunities for children's creativity (see Chapter Eight).

Museum learning is visitor-dependent and uniquely shaped by each visitor's background (see section 'Visitor Experiencescape: Visitor Portrait' in Chapter Three). Consequently, while museums have learning priorities, exhibits do not instruct as much as they actively engage visitors in positive experiences. Findings of Study 2 (see Chapter Seven) suggest that children's museum professionals understand that while they can set the stage for engagement, visitors engage in their own, sometimes unexpected, ways. These findings further indicate that children's creativity at the children's museum is influenced by child factors, and that children's museums generally provide exhibits, materials, and personalised

facilitation (e.g., guided discovery, open-ended questions) that accommodate a diversity of person-environment fits, such as visitor interests, learning styles, and visitor backgrounds, and which invite children's creativity across domains, interests, materials, and levels.

Developmentally appropriate for children, children's museums also cater to caregivers (see section 'What?' in Chapter Two). However, while Study 1 (see Chapter Five, Kupiec, 2024) findings show that family-friendly features are one way in which children's museums intend to achieve creativity, and Study 2 (see Chapter Seven) findings suggest that museum professionals appreciate caregivers' participation, Study 3 (see Chapter Eight) findings reveal that caregivers view the children's museum as primarily for their children rather than for family social interactions and, further, that they do not recognise opportunities for adult creativity. In other words, caregivers do not perceive the children's museum as a place for family engagement in the same ways that children's museums intend and museum professionals hope for. Nonetheless, children's social environments influence their creativity, including in children's museums (see Chapter Six; see Chapter Seven; see Chapter Eight). Together, these findings suggest that while children's museums are well-designed for child-museum creative engagement, optimising caregiver-directed practices could maximise the quality, and thus generativity, of these engagements.

Experience Design: Supporting High-Quality Engagement

Through their design and practice considerations, children's museums offer visitor-centred *opportunities* for creativity. However, museum visits unfold as visitors (inter)act with(in) the museum, such that museum experiences are also visitor-created. During family visits, caregivers play a vital role supporting and participating in their children's engagement and learning (see Chapter Three). In fact, Study 2 (see Chapter Seven) found that *how* caregivers (inter)act with(in) their children and the museum environment influences their children's engagement, including their creativity. In particular, the findings suggest that the greatest potential for enhancing children's creativity may lie in supporting caregivers to enact *mindful* behaviours during children's museum family visits.

Study 3 (see Chapter Eight) findings suggest that caregivers recognise the children's museums as a place for their children to engage, but not necessarily for them to participate too. These findings also suggest that caregivers might value children's engagement itself more than the generative museum learning it can lead to. This indicates that caregivers may be less concerned about the *quality* of museum engagement and, thus, their role in

supporting it. Moreover, and specific to creativity, caregivers recognise that child creativity is condition- and engagement-dependent, acknowledging the importance of environments and opportunities that allow children to be creative; however, they also believe both that adults hinder children's creativity and that children's museums are more for child-museum engagement than social interactions (see Chapter Eight). According to Bandura (1978b), "false beliefs activate avoidance responses that keep individuals out of touch with prevailing environmental conditions" (p. 346). Without support to recognise the opportunities for, and benefits of, their mindful (dis)engagement, caregivers may step back intentionally. While experience design can support caregivers (see section 'Supporting Caregivers' in Chapter Three) and children's museums do provide caregiver-directed guidance, findings of Study 2 (see Chapter Seven) suggest that museum professionals engage in minimal explicit creativity-related orientation and prompting. Thus, one promising avenue to enhance children's creativity may be to better mobilise caregivers through design and practices that are specifically tailored to them and their opportunities to engage, as well as explicitly offered.

Optimising Design and Practice for Caregiver Behaviour Change

Across the three studies, this work suggests that children's museums offer great opportunity for creativity. However, without optimising caregiver-directed design and practices to support caregivers as engagement partners during family visits, the potential for children's creativity may remain only partially realised. Findings of Study 3 (see Chapter Eight) suggest that one promising avenue to support caregivers in enacting creativity-enhancing behaviours during family visits may lie in focusing on shifting caregivers' perspectives to recognise the children's museum as an opportunity for them to facilitate their children's creativity and to be creative alongside and with their children. The findings further suggest that these efforts might be most accepted and effective in the children's museum context when delivered through videos that highlight information about the conditions that support children's creativity and that demonstrate and teach about creativity-related behavioural skills. As children's museum professionals express understanding of caregiver differences and needs (see Chapter Seven), it is essential to provide caregivers with a variety of mindful behaviours they might draw upon, including those that are hands-on (e.g., asking open-ended questions, role-playing together with their child, explicitly telling their child to be creative) and hands-off (e.g., tolerating appropriate

levels of noise and mess, allowing sensible risk without intervening, giving their child time to work at their own pace). Moreover, as a resource-based and low-cost intervention, videos may hold promise for feasibility and scalability without compromising fidelity, and, thus, they may also support the across-institution conversations and practice development that was identified in Study 2 (see Chapter Seven). While developing a video as described here is a practical next step, future research is needed to evaluate its effectiveness in supporting caregivers' mindful (dis)engagement and, in turn, children's creativity.

Measuring Creativity During Children's Museum Family Visits

The structure of the progressive focusing approach for this thesis was guided by an adaptation of Voogt and Roblin's (2012) conceptual framework of intended curriculum, implemented curriculum, and attained curriculum to intended practice, implemented practice, and informing practice. The adaptation of "attained" to "informing" supported the present goals for optimising museum design and practices to maximise their contributions towards children's creativity (see section 'Progressive Focusing' in Chapter Four). Returning to this framework, the next steps of research could focus on whether optimising caregiver-directed design and practices with an intervention that has been informed by the present findings *attains* its goals in effectively mobilising caregivers to enact mindful behaviours, and whether and how these changes contribute to maximising children's creativity. According to Voogt and Roblin (2012), "appropriate assessment practices need to be in place to be able to determine whether expected learning outcomes are achieved—i.e. *the attained curriculum*" (p. 301, emphasis in original). Findings of Study 2 (see Chapter Seven) show that, while museum professionals reflect on creativity, they do not have a way to identify or measure it. Drawing on the findings of the present work, literature, and existing observational tools, the first steps of developing an assessment tool to support museum practice and research have been undertaken and are discussed in Appendix R.

Echoing Tensions of Power and Equity

Dewey (1934) considered the environment "human as well as physical, that includes the materials of tradition and institutions as well as local surroundings" (p. 246). While experience design focuses on participation, or the microexperience of an individual's engagement with museum opportunities, museums are informed by and situated within a broader culture and within a visiting group's family practice (e.g., Moussouri, 2024) (see section 'Tension' in Chapter Three). Distal influences of family practice, which can be

considered through the macroexperience of an individual's ongoing life journey, inform their in-museum engagement, interactions, and caregiver behaviours. These influences may lie at odds with the perspectives that inform museum practice and underpin experience design decisions, creating mismatch that may hinder generative experiential engagement (see section '(Mis)match' in Chapter Three).

It is important that museum professionals implement design and practices that can match the breadth of the visitor portrait, both in how visitors diversely (inter)act *with(in)* the museum *and* inclusively in what they *bring to* the museum, meeting *their* worldview instead of the world's view of them. It is evident that children's museums offer variety, balance, and personalisation to accommodate diverse child-environment fits; however, less work has focused on inclusion at the level of family practice. In fact, the present findings suggest that children's museums' practices and expectations may, at times, be incompatible with, if not ignorant of, visitors' family practices and expectations. Although efforts are being undertaken and some progress is evident, it is noteworthy and significant that children's museums seem to be concentrating many of these efforts on unidirectionally bridging gaps rather than mutually closing gaps (see section '(Mis)match' in Chapter Three; see Chapter Seven). Looking ahead, children's museums need to be more institutionally conscious of the *family* practices of diverse and nondominant communities, and more self-critical of their own *museum* practice and the distal influences that become embedded in their design, including how these may be grounded in normative views and assumptions. These shifts are vital for addressing underlying equity and power tensions and mitigating their potential consequences. As Hein (1998) writes:

> Our culture is the sea in which we swim, as transparent to us as the ocean is for the fish that live in it.
>
> . . . we can make the effort to think through the underlying principles on which we base educational activities and shape the general educational stance of the museum according to these principles, or we can follow an unexamined collection of policies and practices that, taken together, present to visitors an educational position which may or may not conform to our desires. (p. 15)

Much of the work in visitor studies takes place in the museum, yet, as museum visits are voluntary and visitors self-selected, visitors differ from non-visitors (see section 'Who?' in Chapter Two). Consequently, though the museum experience varies with the visitor

portrait (see section 'Visitor Experiencescape: Visitor Portrait' in Chapter Three), many of the insights that have been generated from across the field are accompanied by an acknowledgment of the narrow sociodemographic participant profile on which they are based, as well as cautions that this may limit their application. However, inclusive design is "a methodology that enables and draws on the full range of human diversity. Most importantly, this means including and *learning from* people with a range of perspectives" (Microsoft Design, 2015, as cited in Holmes, 2018, p. 54, emphasis added). In fact, literature across the field recognises that museum experience design and practice would benefit from more diverse input to close current gaps, such that museums could more optimally serve all members of their community (e.g., Briseño-Garzón & Anderson, 2012; Golden & Walsh, 2013; Maldonado & Nguyen, 2020; Weiland, 2015; see section 'Progressing Towards Resolution' in Chapter Three). Despite present efforts that endeavoured to capture the voices of nonvisitors through an online survey with recruitment outside of a children's museum, this work has been constrained by capturing a homogenous sample of caregivers that identify with the profile of museumgoers. This persistent difficulty in engaging the full scope of voices from a community in not only museum visitation, but also museum-related research activities seeking to understand and close mismatch, poses a serious threat to the field.

Without striving towards resolution that respects what both diverse visitors and the museum bring with them and offer, museums unfairly risk disengagement and/or stifled experiences for select visitors. This could prevent visitors' museum learning (see section '(Mis)match' in Chapter Three), especially their creativity, which necessitates engagement and time to unfold (see section 'Creativity is an Experience' in Chapter Six). While this work has echoed the significance of museum-visitor tensions of power and equity that call for more inclusive children's museum research and practice, future work with diverse samples is imperative to better understand and alleviate museum-visitor mismatch, which could, in turn, contribute to maximising visitor outcomes, including creativity.

Child Creativity During Family Visits to the Children's Museum: Strengths, Weaknesses, Opportunities, and Threats

Unfortunately, and counter to the reasons research should be undertaken, research does not always find its way into the hands of the very people who could benefit from it (see section 'Evaluation' in Chapter Seven). However, as Biesta (2007) emphasises:

> It seems to be a huge waste of time and resources if the outcomes of educational research never reach educational practice. Educational research is, after all, never simply research *on* education but always in some sense also research *for* education. (p. 299, emphasis in original)

Through a progressive focusing approach, this research strived to be relevant to children's museums and beneficial for their visitors (see section 'Positionality' in Chapter Four). Thus, to support children's museums' practice-oriented conversations and research agendas, the findings that were discussed in each empirical chapter (see Chapter Five, Kupiec, 2024; see Chapter Seven; see Chapter Eight) have been synthesised through a lens inspired by an organisational SWOT analysis, or an identification of the most significant strengths, weaknesses, opportunities, and threats. This synthesis can be found in Appendix S.

Stakeholder Limitations and Future Directions

Beyond a homogenous and narrow sample constraining the present findings, the foci of this thesis on museum and caregiver perspectives, the family visiting group composition, and the American context add limitations to the work and, accordingly, indicate where future research would be beneficial.

Children's Perspectives

Although "when you engage in design, you intentionally create something in order to produce a desired change" (Rossman & Duerden, 2019, p. 14), "the intentions of the museum curatorial groups and designers may or may not align with the mission and knowledge of the visiting groups" (Leinhardt & Knutson, 2004, p. 74). When there is too much mismatch between a visitor and their environment, the potential depth of and resulting growth from experiential museum engagement can remain latent (see section '(Mis)match' in Chapter Three). While this work has benefitted from each study of this thesis drawing upon a different voice (i.e., institutional, museum professionals, caregivers), it is limited by not capturing children's voices, as the design of effective museum experiences is likely to be supported by children's direct involvement in museums' design and feedback cycles (e.g., Andre et al., 2017). In addition, the little research that, to date, has explored children's and adolescents' creativity beliefs has primarily been conducted in relation to school classrooms (e.g., Coulson & Burke, 2013; McLellan & Nicholl, 2013), and the present work has shown that it is important to study creativity in context, including in children's museums.

Illustrating potential benefits of child-museum alignment, such as children's recognition and understanding of opportunities for their engagement, evidence suggests that children benefit from pre-visit museum activities and exhibit orientations (e.g., Acosta et al., 2021; Falk & Dierking, 2013; Lawson et al., 2018). This could hold true for creativity, as creativity is influenced by prior activity (Amabile, 1996). For example, children who participated in a 10-minute mindfulness induction at an art gallery created drawings that were judged as more creative than the control group's drawings (Zabelina et al., 2020). Additionally, findings from Study 2 (see Chapter Seven) suggest that repeat museum visits contribute to greater creativity, potentially due to visitors having already developed familiarity with what is available to engage with and how to engage with it. Another potential type of misalignment, child-caregiver misalignments regarding visit goals and expectations (see section '(Mis)alignment' in Chapter Three) might result in caregiver behaviours that are unintentionally mindless towards their children's engagement, which can hinder their creativity (see Chapter Seven). Study 2 (see Chapter Seven) findings also suggest that children do sometimes make bids for their caregivers' engagement; however, it would be valuable to better understand whether, how much, and in what ways children would like their caregivers to play with them at the children's museum. If, for instance, children prefer having time to play without their caregivers during their visits, mindfully disengaged caregiver behaviours could be more effective at enhancing children's creativity than mindfully engaged behaviours. Future work is needed to explore children's perspectives on creativity, whether they recognise children's museum opportunities for their creativity, their engagement preferences during family visits, and their expectations of their caregivers.

The Visiting Group

This thesis has used a broad and inclusive definition of "family" (see section 'A Focus on Family Visits' in Chapter Three), and future work is likely to benefit from exploring more nuanced family groups. For instance, observational evidence suggests that families tend to divide themselves when exploring museum exhibits, such as into caregiver-child dyads or into individual engagement (e.g., Ash, 2003; Erätuuli & Sneider, 1990; Vishkaie, 2021). These different and at times shifting configurations may influence museum engagement and learning, as evidence also suggests that exhibit interactions depend on factors of the family group, including the number of children and the age of the youngest child (e.g., Braswell,

2012; Heuken et al., 2021). Notably, while museum professionals often discussed caregiver-child interactions, siblings were rarely mentioned (see Chapter Seven).

Future work is also likely to benefit from exploring other types of groups children typically visit children's museums with, such as their school class. In fact, museum professionals reported some differences in both their practices and children's creativity between family visits and non-family group visits, including class field trips (see Chapter Seven). These findings from Study 2 suggest that explicit orientation and structured facilitation (e.g., guided activities, directed programmes) are more prevalent for non-family visiting groups, compared to greater free-choice and impromptu facilitation during family visits. Thus, non-family visiting groups' creative engagement may more closely resemble formal learning, or school contexts for creativity. Findings of Study 2 also suggest that children visiting with their classmates may role-play together longer. As a result, who children visit with might have implications on examining group creativity at the children's museum. Future work is needed to explore differences between children's various possible visiting group compositions, such as distinct family configurations and family versus non-family visiting groups.

American Children's Museums

The last significant stakeholder limitation is the focus on American children's museums. The decision to focus the present work on American children's museums was made to reduce the risk of compounding limitations (see section 'American Children's Museums' in Chapter Five, Kupiec, 2024). While museum-visitor tensions of power and equity, including those stemming from cultural backgrounds, have been discussed above (see section 'Echoing Tensions of Power and Equity' above), the limitations of a narrow cultural context could become compounded with the present focus on children's creativity. Creativity is not only circumstantially conditional, but it is also influenced by distal environmental factors, including an individual's culture (see section 'Climate' in Chapter Six). Moreover, notwithstanding some similarities, cross-cultural studies show that individuals from different cultures have some differences in their creativity conceptualisations, including those regarding children (e.g., Lim & Plucker, 2001; Runco, 2014; Runco & Johnson, 2002; Sawyer, 2012), which could influence how creativity is designed for, supported, and recognised. Thus, research conducted in other cultural contexts is needed.

An (Un)limiting Creativity Focus

Children's museum experience design elements that effectively support some types of museum engagement, (inter)action, and learning might not be effective for others (e.g., Braswell, 2012; Caporaso et al., 2022; Letourneau, Meisner, & Sobel, 2021; Puchner et al., 2001). While creativity is prioritised by children's museums (see Chapter Five, Kupiec, 2024), it is neither the only goal of engagement nor the only form of museum learning that visitors experience. Fortunately though, it is likely that creative places and creativity-enhancing environments may benefit more than creativity itself. For instance, a review of the impacts of creative school learning environments found that they support children's academic achievement; confidence and resilience; motivation and engagement; social, emotional, and thinking skill development; and attendance (Jindal-Snape et al., 2013). Evidence also suggests that students whose teachers use more creativity-eliciting behaviours make greater academic gains (Schacter et al., 2006). Importantly, caregivers' definitions of child creativity show that they recognise its ability to mediate towards other benefits (see Chapter Eight).

Though less evidence is known about out-of-school places, children's museum mission statement analysis indicates that creativity is considered a mediator for other museum outcomes (see Chapter Five, Kupiec, 2024). However, while learning was viewed as an important aspect of children's museums, museum professionals were not always sure about the relationship between creativity and learning in their exhibits, and it was clear that, to them, learning and creativity might be independent (see Chapter Seven). This link would be valuable to explore further, including through research into the temporal order of microexperience touchpoints and their outcomes—for instance, it might be that eliciting positive affective-conative increases creativity, which in turn increases learning. Moreover, evidence suggests that children's factual knowledge or conceptual museum learning might occur best collaboratively and with caregiver scaffolding (i.e., mindfully engaged behaviours) in various museum settings (e.g., Fender & Crowley, 2007; Puchner et al., 2001; Weisberg et al., 2023). However, to enhance creativity, findings from Study 2 suggest that caregivers can also be mindfully *dis*engaged (see Chapter Seven), which is reasonable given that creativity is less "teachable".

Future work needs to consider the following: if intervention successfully changes caregivers' behaviours and, in turn, enhances children's creativity, does this *support* or

replace other important aspects of children's museum family visit experiences and learning? Furthermore, and given that Lifelong Competencies support lifelong learning (see Chapter Five, Kupiec, 2024): if a focus on creativity was found to sacrifice other potential benefits during a children's museum microexperience, would that ultimately be detrimental in terms of potential change across the macroexperience, extending from short-term outcomes to contributing towards long-term impacts?

Applying Theoretical and Conceptual Contributions

Supporting Social Learning Theory

Findings support applying Social Learning Theory, particularly the concepts of reciprocal determinism, observation, and efficacy, as a promising approach to frame future children's museum research and practice (see section 'Fit of Applying Social Learning Theory' in Chapter Three), especially for experience-based outcomes, including creativity.

This work has demonstrated the relevance of *reciprocal determinism* in two ways. Firstly, findings across the three studies highlight the importance of shifting away from a sociocultural theoretical underpinning while also illustrating the significance of including a direct visitor-physical environment engagement link: mission statement findings suggest that children's museums plan for creativity through hands-on and interactive exhibits and experiences (see Chapter Five, Kupiec, 2024); museum professionals believe that hands-on engagement with exhibit materials makes the children's museum a unique place, and that open-ended materials enhance creativity (see Chapter Seven); and caregivers believe that being hands-on/interactive is the most important thing about a children's museum visit, whereas the socially interactive aspects of a visit are least important (see Chapter Eight). Secondly, caregivers and children have separate roles, and evidence shows that these reciprocally determine each other. For instance, findings of Study 2 (see Chapter Seven) suggest that child factors can influence caregiver behaviours, which, in turn, have a significant influence on children's creativity. Moreover, which behaviours caregivers enact and how (mis)aligned caregiver-child goals are may determine whether creativity at the museum is experienced as an episode of children's individual creativity, even if externally encouraged, or of jointly engaged group creativity. Future research conducted during children's museum family visits, particularly that which is framed by reciprocal determinism, has the potential to significantly contribute to understandings of group creativity, including

intergenerational group creativity (see section 'Group Creativity' in Chapter Six; see section 'Family Visits' in Chapter Six).

While a wealth of evidence suggests that learning through *observation* occurs during museum visits (see section 'Observation' in Chapter Three), present findings illustrate that consideration must be taken for *how* museum design and practice support observational learning. For instance, findings of Study 2 (see Chapter Seven) suggest that implicit caregiver guidance, including museum facilitator modelling, may not effectively support mindful behaviours. Moreover, Study 3 (see Chapter Eight) findings show that, even while caregivers would like to learn more about child creativity through watching others successfully support child creativity, caregivers do not believe that engaging with museum professionals during their visits is important. Study 2 (see Chapter Seven) further found that children's creativity depends on the examples offered in a space and that, to support creativity, these should be provided in ways that spark inspiration rather than imitation. Lastly, findings of Study 2 also suggest that mind-on caregiver behaviours may enhance children's creativity regardless of whether they are hands-on or *hands-off*, and support that the museum context offers opportunities for caregivers to learn about their children (e.g., their interests) through observation (see section 'Roles' in Chapter Three).

Finally, the findings demonstrate the central role that *efficacy* plays not only in understanding and supporting museum engagement more broadly but also in maximising children's creativity specifically. For instance, museum professionals observe that museum familiarity can support children's creativity, including by reducing creativity-hindering affective-conative states such as fear (see Chapter Seven). Highlighting creativity-specific efficacy, findings also suggest that caregivers may lack the creative self-efficacy necessary to engage with creative opportunities and to support their children's creativity (see Chapter Eight). Additionally, by successfully supporting episodes of their children's creativity, caregivers might build their self-efficacy (i.e., their creativity-related behavioural skills, as conceptualised in the IMB model) to enact creativity-enhancing mindful behaviours at other times and in other settings. Similarly, as creative experiences can nurture children's creativity over time, children may develop greater creative-self efficacy and stronger creative self-identities through their engagement with creative opportunities at children's museums (see section 'From Supporting to Nurturing Creativity' below).

Using The Visitor Experiencescape to Support Inclusive Design

A conceptual contribution applied throughout this thesis to model and understand visitors' experiences and their museum learning, the Visitor Experiencescape (see Figure 3.2) can also be used as a tool to support museums in optimally designing experiences. Museum-visitor mismatch is most apparent during the engaged participation phase of the microexperience. During participation, visitors' visitor portrait variables, which are partly informed by the anticipation phase of the macroexperience, interact with children's museums' beliefs and expectations, which are partly informed by the museum's anticipation of its visitors and embedded in the design and practices of the physical environment and social situation they offer. Thus, although mismatch does not arise until the participation phase, the foundation for its potentiality is set in the museum's anticipation of its visitors. In fact, findings from Study 2 (see Chapter Seven) illustrate the importance of distal influences in children's museum design and practices and, as a result, Bronfenbrenner's Ecological Systems Theory (1979) was suggested as a more complete experience design lens.

Rossman and Duerden (2019) note that "there is a tendency to focus on staging the participation phase while giving less attention to the anticipation and reflection phases" (p. 152). Despite that the Visitor Experiencescape is not a predictive model and cannot be used prescriptively, it does model the end-user's perspective and their experience from anticipation through reflection (see section 'Macroexperience' in Chapter Three). As such, it may be one promising avenue to alleviate mismatch before it arises, thereby contributing to maximising realised outcomes. For instance, although the field does not yet know enough about the diversity of visitor portraits (see section 'Echoing Tensions of Power and Equity' above), museum professionals can utilise the Visitor Experiencescape as a reflective tool, using personas to model diverse potential visitor portraits and, thus, potential experiences. This could support their understandings of visitors' anticipation and, consequently, inform their experience design and practice decisions.

The Value of a Seed Versus Soil Approach in Optimising Efforts

Another contribution of this work is the application of wise interventions to the field of visitor studies, including drawing the distinction between the "soil" and the "seed" in optimising experience design and practices to maximise museum learning. Though the present findings suggest that the "soil" of children's museums is fertile for children's creativity and that a well-designed "seed" could support caregiver behaviour change that

may, in turn, enhance children's creativity (see section 'Wise Interventions' in Chapter Eight), there are many types of museum engagement and museum learning (see section 'Why?' in Chapter Two). Designing for other outcomes may require contextual, or "soil", changes before being able to offer a productive "seed".

The focus of wise interventions on shifting individuals' subjective meaning-making, interpretations, and beliefs can also, in conjunction with the Visitor Experiencescape, support the field in engaging in critical reflection and in mutually closing, rather than unidirectionally bridging, gaps of mismatch. For instance, exploring museum engagement and learning through this lens demands that practitioners and researchers consider where efforts might be most effective (i.e., whether in the "seed" or the "soil") before assuming the visitor is "wrong" and needs to "change" simply to match pre-existing, but unexamined, museum practice (see section 'Tensions of Power and Equity' above). This would require thoughtful reflection across the field on how much could and should be done to adapt museum contexts versus supporting visitors, or, in other words, whether promising experience design and practice changes lie in the "soil" or the "seed". Such insights may further contribute not only to maximising visitor outcomes but also to optimising limited institutional resources.

Broadening Implications

From Supporting to Nurturing Creativity

Creativity is a growth-oriented competency (see section 'Creativity is Growth-Oriented' in Chapter Six), and findings from analyses of children's museums' mission statements and interviews with children's museum professionals indicate that they are not only concerned with supporting creative experiences during the children's museum visit but also with nurturing its lifelong development (see Chapter Five, Kupiec, 2024; see Chapter Seven). This is a reasonable aim given that children's museums support *lifelong* learning (see section 'What?' in Chapter Two), museum learning emerges from *or in relation to* a museum experience (see section 'Outcomes' in Chapter Two), and Lifelong Competencies, such as creativity, continuously develop across one's lifetime with unlimited growth (see section 'Lifelong Competencies' in Chapter Five, Kupiec, 2024). These longer-term changes can be captured by the macroexperience of the Visitor Experiencescape (see Figure 3.2). However, the immediate benefits, short-term outcomes, and long-term impacts of museum visits do not always align (see section 'Macroexperience' in Chapter Three). While it has been

necessary to first understand how children's museum design and practices can support creativity during family visits, it is also paramount to consider how these visits might nurture children's creativity.

Each experience an individual has sits within and connects to their ongoing life journey (see section 'Experience' in Chapter Three), such that "every experience enacted and undergone modifies the one who acts and undergoes, while this modification affects, whether we wish it or not, the quality of subsequent experiences" (Dewey, 1938/1997, p. 35). Relevant to the present work examining the caregiver-child dynamic during children's museum family visits, these changes may occur within the individual *and* in those they interact with. In fact, Bronfenbrenner (1979) proposed that, "if one member of a dyad undergoes developmental change, the other is also likely to do so" (p. 65), such that "the dyad [is] a context not merely of reciprocal interaction but of *reciprocal development*" (p. 65, emphasis in original). As a shared visiting group experience is simultaneously unique to each member within it and influenced by the role that they play (see Chapter Three), it is necessary to understand the distinct changes that the caregiver and the child each undergo, as well as how they might influence each other over time, including their later (self-)beliefs, behaviours, and engagements. It is also important to consider longer-term changes that may occur at the group level, such as how family creative practice could develop over time, as Ellenbogen et al. (2004) urge the field to "understand the role that museums play in family learning" (p. S56).

Modelling a growth-oriented competency, and as illustrated by its stem, the CLOVER (see Figure 6.1) is not only valuable for understanding episodes of creativity but also for considering how an individual's creativity changes over time. Together, the CLOVER and the IMB model (see Chapter Eight) offer a starting point for hypothesising about how implementing a caregiver-directed wise intervention to support caregivers in enacting creativity-enhancing mindful behaviours during family visits to children's museums might lead to enduring changes in caregivers' creativity-enhancing behaviours *and* children's creativity, both over repeated museum experiences and to out-of-museum contexts.

Caregiver

Children's museums cater to young children *and their caregivers* (see section 'What?' in Chapter Two). Highlighting their goal to support caregivers in ways that endure over time and carry into out-of-museum contexts, the Association of Children's Museums'

Fostering Character Through Children's Museums initiative aims to "work with the cohort museums to inform, engage, and educate parents and caregivers so they too can help sustain character development conversations, activities, and modeling in the home" (Association of Children's Museums, n.d.-c, para. 2). Although a small body of work, emerging evidence suggests that museum visits do impact adults' later out-of-museum behaviours (e.g., conservation behaviours: Kelly & Skibins, 2021; a teacher expressing more confidence using magnifying glasses in their classroom: Gutwill, 2018). However, there is little evidence to date on the long-term or sustained impact of children's museum experiences on caregivers' behaviours during later caregiver-child interactions.

The successful implementation of a wise intervention informed by the IMB behaviour change model offers promise for enduring, rather than episodic, caregiver behaviour change. Experience engaging with an intervention can affect future intervention acceptability (Casale et al., 2023), and seeing improvement and receiving positive feedback can lead to a self-enhancing cycle for lasting behaviour change, including maintaining and strengthening behaviours and increasing motivation (Bandura, 1988; Fisher et al., 2003; Walton & Wilson, 2018). Therefore, as part of reciprocal development, caregivers who see a positive change in their children's creativity may be more *motivated* to enact creativity-supporting behaviours during future museum visits and in different contexts. Additionally, "people's efficacy and outcome expectations influence how they behave, and the environmental effects created by their actions in turn alter their expectations" (Bandura, 1978b, p. 344). Mastery experiences, such as caregivers' successfully enhancing their children's creativity, are the most effective avenue to increase self-efficacy (Bandura, 1978a, 1988). Thus, through implementing intervention-supported mindful behaviours and witnessing positive changes in their children's creativity, caregivers are likely to not only build their abilities through practice but also gain self-efficacy and confidence, thereby increasing their creativity-enhancing *behavioural skills*. Finally, because changing individuals' subjective meaning-making, perspectives, and beliefs does not necessitate an extended period of time or practice (Walton & Wilson, 2018), the impact of *information* on caregiver behaviour is unlikely to change over time.

Through repeated positive episodes of enhancing their children's creativity, caregivers' creativity-supporting behaviours may become less consciously effortful and more automatic or habitual, thus becoming part of their family practice, and potentially

contributing to establishing a family creative practice. However, that wise interventions have "a narrow focus on situations carries another important limitation: Change may not generalize to new situations" (Walton & Wilson, 2018, p. 634). While self-efficacy tends to generalise to other situations and activities, it does so more predictably in those similar to the opportunity through which self-efficacy was "restored", such that an individual's practice of behavioural skills in their natural environment may best support their subsequent implementation (Bandura, 1978a, 1988). As children's museum exhibits do reflect real-life, visits are self-chosen activities, and caregiver-child play is an activity that occurs across settings, it is promising that caregivers' creativity-enhancing behaviours would transfer across contexts. On the other hand, because children's museums are unique from other places, visits tend to be infrequent, and *creative* self-efficacy is situational, even if an intervention is able to effectively support caregivers' behavioural skills during children's museum visits, transfer may be limited beyond the children's museum. More work is needed to understand the difference in caregiver behaviour change between accumulating episodes in the same context and its transfer across diverse contexts.

Lastly, factors of a caregiver's visitor portrait may moderate the long-term impact of a creativity-focused, caregiver-directed wise intervention in the context of a children's museum family visit. For example, evidence suggests that, despite similar levels of content knowledge upon entering a museum and immediately after exhibit engagement, adults who visit primarily to support the experience of another member of their visiting group (e.g., their children) do not maintain their museum content knowledge gains at a delayed post-test as much as those whose visits are primarily motivated by their own learning and curiosity (Falk, 2006). In addition, evidence suggests that increases in adults' science self-efficacy have greater follow-up staying power for women than men (Gutwill, 2018). This further substantiates the necessity of diverse samples in future work.

Child

As an experience, and as represented by the CLOVER (see Figure 6.1), creativity varies in response to changes in individual (i.e., thinking and feeling) and environmental factors (see Chapter Six). Although it has been suggested that it is easier to change an individual's environment than their personality traits or cognitive capabilities (e.g., Amabile, 1989; Csikszentmihalyi, 1996), it is crucial to consider how environmentally-supported creative episodes during children's museum family visits might accumulate and/or

compound to nurture children's creativity, particularly as childhood is a critical developmental period for creativity (see section 'Creativity is Growth-Oriented' in Chapter Six).

There has been limited research to date investigating how caregivers' behaviours during children's museum family interactions influence their children after caregiver-child engagement. Nonetheless, what little evidence does exist suggests that the effects of caregiver behaviours on children can persist. For instance, Sobel et al. (2021) found that child agency and caregiver roles during problem-solving exhibit interactions significantly impacted children's engagement and success on an immediate follow-up child-only activity. Thus, supporting caregivers' creativity-enhancing mindful (dis)engagement may not only support children's creativity during museum visits, it could also influence their later creative activity, contributing towards nurturing children's creativity.

Evidence suggests that being creative and having creative experiences increases creativity and creative achievement (see section 'Experience-Dependent and Opportunity-Linked' in Chapter Six). Moreover, while positive affective-conative states may enhance creativity, creativity itself can lead to positive emotions (Amabile et al., 2005). With repeated positive creative experiences, children may develop greater confidence in their own creativity and increased self-efficacy to express it, contributing to the formation of their creative self-identities (see section 'Critical Developmental Period in Childhood' in Chapter Six). Thus, if caregivers repeatedly provide a creativity-supporting environment for their children by enacting mindful behaviours, the positive effects from each experience could accumulate, thereby "watering" children's feeling leaflet. This growth of children's feeling leaflet, which operates as a creativity catalyst (see section 'The Distinct Contribution of Each Component to Creativity as a System' in Chapter Six), would likely result in a greater propensity to engage and act creatively, creating a compounding cycle for growth, or nurturing children's creativity. Conversely, if caregivers repeatedly behave mindlessly, children's stifled and disengaged experiences could trigger a downward spiral through which children do not experience mastery in creative experiences. This may result in children's lower creative capabilities and potentially limited creative self-identities, leading to children avoiding future engagement in creative activities.

Positive emotions, such as those experienced by children during children's museum engagement, can support the development of a wide range of personal resources

(Fredrickson, 2001; see section 'Nurturing Children's Creativity' in Chapter Six). As such, children's museum experiences could also support the growth of children's thinking leaflet. Although children's museums do not explicitly train creativity-specific strategies, by observing others' modelling creativity and using their own creativity (e.g., through perspective-taking during role-play), children's creativity-specific strategies are likely to develop. Furthermore, children's museums offer a variety of ideas and materials that are distinct from those encountered in other places in children's lives. Through gaining knowledge, such as that of exhibit themes, and by becoming familiar with novel materials, children's general cognitive abilities may also increase, including those that could contribute to their creative capital and, thus, future creativity. In fact, Study 2 findings (see Chapter Seven) suggest that children may be more creative with repeated children's museum visits because they can go deeper at an exhibit. Additionally, "creative activity can indirectly lead to an increase in domain-relevant learning by leading to an increase in intrinsic task motivation" (Amabile, 1996, p. 124). While children's museum professionals did not always link creativity and learning (see Chapter Seven), educational experiences are one way in which children's museums intend to achieve creativity *and* creativity is viewed as a mediator for learning (see Chapter Five, Kupiec, 2024), illustrating a significant link for further exploration.

Finally, a wealth of evidence suggests that children's museum experiences extend beyond the museum walls. For instance, museum field trips increase children's possibility thinking during related follow-up lessons in the classroom (Gregoriou, 2019). Additionally, caregivers sometimes seek future opportunities for children to continue exploring newfound interests, and children incorporate elements of their museum visits into their later imaginary, pretend, and role play (e.g., Anderson et al., 2002; Briseño-Garzón et al., 2007b; Taylor & Kervin, 2022; see Chapter Seven). Thus, it is likely that children's creativity in the museum setting would extend into their out-of-museum places, at least to the extent that the circumstantial factors (e.g., social environment, physical environment, affective-conative states) are conducive for creativity. In these ways, supportive episodes of creativity could contribute to children's and families' creative practices beyond children's museums.

Informal Educational Environments

This work has argued that it is imperative to consider creativity *in context*—physically and socially. Further underscoring the importance of conducting research on

creativity in context, present findings suggest that significant differences exist between schools' and children's museums' institutional constraints and between teachers' and caregivers' creativity-related information, motivation, and behavioural skills understandings (see Chapter Seven; see Chapter Eight). However, review evidence shows that 89% of child-directed creativity interventions have been conducted in schools and 41% have been administered by teachers, while 27% were used by children independently and 22% facilitated by researchers (Alves-Oliveira et al., 2021). Thus, by exploring children's creativity during family visits to children's museums, this work makes a significant contribution to the field of creativity. Chapter Two (see section 'Similar but Distinct: Implications') highlighted that children's museums are both distinct from *and similar to* other museum types, suggesting the relevance for and application of research and museum practice across museum types, while also cautioning against their implementation without deeper reflection. This section begins that reflection.

Present findings suggest that children's museums often have many exhibit themes, design elements, and practices in common, and that they collaborate in ways that support their development of both institutional practices and visitor opportunities; at the same time, they also sensitively adapt these to meet their own needs and identities, as well as to reflect their local communities (see Chapter Seven). As such, it is evident that museums already *are* reflective and that their design and practices *are* responsive to local contexts and interests, or, in other words, that children's museums engage in translation rather than replication. These findings support implementation science as a lens to frame the application and adaptation of design and practices across children's museums.

Other museum types and interpretive environments can usefully and successfully draw upon children's museum design and practices (e.g., Cohen, 1987; Enseki, 2007). However, cautions of feasibility and relevance across contexts must be considered. In fact, "a working model is not something to be copied; it is to afford a demonstration of the feasibility of the principle, and of the methods which make it feasible" (Dewey, 1900/1990, p. 94), and "there must be a reason for thinking that they will function in generating an experience that has educative quality with particular individuals at a particular time" (Dewey, 1938/1997, p. 46). For instance, psychological vulnerability and the relationships between intervention acceptability components (e.g., burden, self-efficacy, perceived social

acceptability) could influence the effectiveness of wise interventions between and across contexts, populations, and behaviours (Casale et al., 2023; Walton & Yeager, 2020).

The environment influences an individual's behaviour (Bandura, 1978b) and, moreover, according to Bronfenbrenner (1979), "if different settings have different developmental effects, then these effects should reflect the major ecological differences between the settings, as revealed by contrasting patterns of activities, roles, and relations" (p. 183). This proposition can help in identifying the contexts and situations in which the present work may hold the greatest promise to support caregivers and enhance children's creativity. As informal educational environments, children's museums are intentionally designed for pre-specified learning goals, including creativity, but experiential outcomes are visitor-dependent and determined through free-choice engagement (see Chapter One). When activities, roles, and relations remain, it is anticipated that creativity may be successfully enhanced elsewhere with the design and practices identified in this work. Thus, to the extent that free-choice opportunities for hands-on engagement are offered and families (inter)act with(in) these environments, the present findings are likely to not only be relevant, but also useful. For instance, findings that caregivers may not want to actively participate with their children during children's museum family visits, and that they may benefit from understanding how adult-child interactions can support children's creativity when adults enact mindful behaviours, hold great relevance to understanding potential mind-off caregiver behaviours and supporting caregiver behaviour change, especially regarding creativity-enhancing mindful behaviours, across informal educational environments. Future work is needed to both explore the applicability of the findings of this thesis to other informal educational environments and to continue examining the similarities and differences in children's creativity and the conditions that enhance it between their first, second, and third places.

Conclusion

A wealth of evidence suggests that creativity is fundamental to success and wellbeing, *and* it is a prioritised purpose of American children's museums themselves (see Chapter Five, Kupiec, 2024). Despite this, little has been known, to date, about creativity in children's museums, and even less is known about the design elements and practices that may enhance it during family visits. While surprising on the surface, this discrepancy between priority and evidence no longer seems odd in light of creativity perspectives,

models, and definitions that do not adequately capture creativity as growth-oriented or provide the language to discuss and identify children's creativity in particular.

Theoretical and conceptual contributions of this thesis to the field include two new models to understand the core elements of this work: the Visitor Experiencescape and the CLOVER. In addition, it was argued that Social Learning Theory would likely be a beneficial underpinning for understanding museum learning, and that wise interventions may be a promising approach for developing visitor support. This work has also refined definitions (e.g., museum, exhibit, museum learning) to continue these conversations through shared language that reflects where the field of visitor studies is today, and proposed and defined a sub-construct of creativity, child creativity, to more effectively discuss and identify the growth-oriented Lifelong Competency of creativity in children.

The understandings and insights gained through the series of three empirical studies of this thesis contribute to knowledge and practice. Findings suggest that, through their intentionally designed environments (e.g., experience design, museum practice) with pre-specified learning goals (e.g., mission statements), American children's museums offer opportunities with great potential for children's creativity. However, during family visits, children's creativity is also significantly influenced by their caregivers' behaviours. While findings suggest that caregivers' mindful behaviours may enhance children's creativity, caregivers do not always enact these during their visits. This may jeopardise otherwise promising children's museums' opportunities and efforts and, thus, sacrifice potential benefits. The present work further suggests that a wise intervention delivered via a caregiver-directed video may be a promising avenue for optimising children's museum design and practices in order to maximise children's creativity during family visits. To be wise to caregivers' perspectives and understandings, such a video should support caregivers in recognising the children's museum as a place for them to be creative with and alongside their children, highlight information about the conditions that support children's creativity, and demonstrate and teach about creativity-related behavioural skills.

Falk (2021) proposed that the societal value of museums can be increased by improving the quality of the experience for existing visitors and/or through reaching a greater quantity of visitors. Findings have suggested how children's museums might optimise the quality of museum design and practices in order to mobilise caregivers; however, tensions regarding increasing the quantity of visitors, particularly through

attracting and engaging current nonvisitors from nondominant communities, have only been echoed. Future work is urgently needed to support the field in resolving these tensions and mutually closing gaps of museum-visitor mismatch. Furthermore, according to Dewey (1938/1997), "the quality of any experience has two aspects. There is an immediate aspect of agreeableness or disagreeableness, and there is its influence upon later experiences" (p. 27). While longitudinal research is significantly lacking in both the fields of visitor studies and creativity, similar to how invested money can earn compound interest, the conceptual arguments of this thesis have offered insight into how investing into children's museum family visits might not only support, but also nurture, caregivers' creativity-enhancing behaviours and children's creativity over time. Lastly, this chapter has begun to reflect on the implications of the present work beyond the children's museum context.

Final Remarks

Education should prepare children for their future (Vygotsky, 1967/2004). In contrast to reproduction that imitates the past, creativity is oriented towards and focused on the future (Vygotsky, 1995, as cited in Lindqvist, 2003). In fact, “play skills and creative abilities help lay the foundation for a child's cognitive and emotional functioning and for a happy and meaningful adult life” (Russ, 1998, p. 478). The world is changing at an unprecedented pace in unpredictable ways. Lifelong Competencies, including creativity, and their impacts on individual and societal quality of life and success are coming to the forefront of discussions on policies, programmes, and interventions. However, we know less about effectively and efficiently supporting the development of these than we do about teaching for content and factual knowledge. Moreover, the field of creativity has been entrenched in traditions, methods, conceptualisations, and definitions that are not necessarily sensitive to children, their contexts, or growth-oriented approaches.

Coinciding with this growing attention, we have entered both the *conceptual age*, driven by creators and empathisers (i.e., the desire and need for Lifelong Competencies) (Pink, 2006), and the *experience economy* (Pine & Gilmore, 2020), positioning informal educational environments, including children's museums, as uniquely poised to contribute to children’s holistic development. In fact, “the activities and environments individuals choose affect the course their lives take” (Bandura, 2012, p. 12). It follows, then, that the field of museum research is on the cusp of another emerging shift that will provide valuable understanding, insight, and opportunity.

Through newly proposed definitions, refined models, and empirical findings, this work contributes to the next steps along encouraging paths forward. However, the field of creativity must not be immune to creativity’s inherent hurdle that “ideas that require changing the status quo will be ignored, because so much effort and capital has been invested in existing production methods” (Csikszentmihalyi, 1999, p. 326). In designing experiences to support and nurture children’s creativity, “it's also important to have the mindset that all experiences are prototypes that can continually be refined” (Rossman & Duerden, 2019, p. 86). There remains much to learn and for future research and practice to discover. After all, creativity is not an end point, but rather an engagement, a means to a

productive and healthy life, and a Lifelong Competency with unlimited growth. It is essential that the work on such a dynamic construct also continue to unfold.

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Appendix A

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Appendix B

Thematic Interview Schedule

Questions about the participant, such as:

- What is your current job title?
- How long you have held that position?
- How would you describe the work you typically carry out in your role?

Questions about the children's museum, such as:

- What is unique about children's museums?
- Why is having a children's museum important for communities? What are the benefits?
- What is the age range that the children's museum targets?

Questions about defining and valuing 'child creativity', such as:

- Does the children's museum have an institutional definition of creativity?
- How would you define 'child creativity'?
- Why is creativity important for a children's museum visit?
- How often/in what ways is creativity discussed among staff members?
- How central is creativity to the museum's design decisions and practice?
- Is the children's museum a place for supporting moments of creativity or nurturing the development of it?
- How is creativity related to learning?
- Is creativity expressed more in a specific domain or area, or across domains?

Questions about designing for creativity, such as:

- Does the children's museum have any ways (e.g., signage, facilitators) to signpost creativity to caregivers or children and/or orient them towards a creative mindset, as a way of indicating that this is a place where 'we want you to be creative'?
- While walking through and showing/describing exhibits, asking participants to discuss how creativity is seen or not seen in each, and what practices, conditions, materials, and interactions contribute to exhibit engagement and in supporting or hindering child creativity. Prompts and probes could include those about:
    - Exhibit materials, including hands-on and interactivity
    - Variety of ways in which visitors are expressing creativity
    - Caregiver engagement and interactions
    - Staff facilitation
    - Technology
    - Influence of visit frequency
    - Different age ranges
    - Different affordances for various types of play
    - Visitor enjoyment and preferences, including motivation
- Are there any specific obstacles that prevent child creativity?

Questions about identifying creativity, such as:

- Does the museum have a way of identifying or capturing child creativity?
- Does the museum conduct any evaluation of child creativity. If so, how is the information used?

Appendix C

Participant Information Sheet for Museum Professionals' Interviews

Curating for creativity: Exploring practices at American children's museums

PARTICIPANT INFORMATION SHEET

Central University Research Ethics Committee Approval Reference: CIA-2223-010

1. Introductory paragraph

You are being invited to take part in a research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and ask if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part.

2. Why is this research being conducted?

Children's museums are unique spaces that offer many benefits to their communities, with great potential in supporting children's development of Lifelong Competencies. The results of a completed mission statement analysis have identified creativity as a prioritized purpose of children's museums in the United States of America. This study is being conducted to explore how children's museum professionals define, design for, and recognize child creativity during family visits.

3. Why have I been invited to take part?

You have been invited to participate in this research because of your current employment as a museum educator, an exhibit designer, or an executive director at a children's museum. Your experience and practice-based insights will be valuable, and you will be one of approximately 15 participants taking part in this research study. You will not be able to participate if you have not been employed with the current children's museum in one of the roles listed above for less than 1 year.

4. Do I have to take part?

No. It is up to you to decide whether or not to take part. You can withdraw yourself from the study, without giving a reason, by advising me of this decision. The deadline by which you can withdraw any information you have contributed to the research is March 31, 2023. If you do decide to withdraw at any point before this date, all data will be destroyed upon withdrawal.

5. What will happen to me if I take part in the research?

If you wish to take part in the research project, written consent will be sought. After this, the research will take place during a researcher's single visit to your children's museum. The research will include an interview on child creativity at your children's museum and will last for approximately one hour. This will be a walking interview through your museum space, including exhibits, such that hands-on practices may be more easily discussed. Where it might be helpful to capture specific design features, photographs may be taken. These photographs will not have any people, including

yourself, in them. With your consent, I would like to audio record you so I can have an accurate record of our conversation. You may ask to pause or stop the research activities at any time.

6. **What are the possible disadvantages and risks in taking part?**

There are no risks in participating in this research. All data will be anonymised to protect your privacy so that you will not be identifiable from the data or the research outputs. The data will be safely stored and destroyed in line with the University of Oxford's regulations.

7. **Are there any benefits in taking part?**

Aside from reflection on current creativity practices, there are no immediate benefits for those people participating in the project. However, it is hoped that this research will lead to a better understanding of creativity in the children's museum and contribute towards the development of a framework that would help children's museums improve their museum practice and design to better support child creativity during family visits.

8. **What information will be collected and why is the collection of this information relevant for achieving the research objectives?**

Written consent forms, audio recordings of interviews that will be transcribed into anonymized files, and photographs of exhibit features (if and when taken, there will be no people in these photos) will be collected.

Consent forms will be electronically scanned and stored in a password protected folder paper copies immediately shredded. Digital files of audio recordings and photographs, where taken, will be destroyed from memory cards upon electronic upload. During data analysis, data will be stored in a password protected folder on the researcher's computer and backed up on the University of Oxford's OneDrive for Business. After publication or public release of the work of the research, all research data will be stored on OneDrive for Business for 3 years.

The researcher and supervisors will have access to the research data.

9. **Will the research be published? Could I be identified from any publications or other research outputs?**

The findings from the research may be written up in a thesis, academic publications, and conference presentations. All participants will be anonymised and their employing children's museum de-identified. You will not be identifiable in the research outputs.

I would like your permission to use direct quotations but without identifying you in any research outputs.

A copy of my thesis/dissertation will be deposited both in print and online in the Oxford University Research Archive where it will be publicly available to facilitate its use in future research.

10. **Data Protection**

The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the study. The University will process your personal data for the purpose of the research outlined above. Research is a task that is performed in the

public interest. Further information about your rights with respect to your personal data is available at https://compliance.admin.ox.ac.uk/individual-rights.

11. Who has reviewed this study?

This study has received ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee. (Ethics reference: CIA-2223-0100).

12. Who do I contact if I have a concern about the research or I wish to complain?

If you have a concern about any aspect of this study, please contact Kathleen Kupiec (kathleen.kupiec@education.ox.ac.uk) or Sonali Nag (sonali.nag@education.ox.ac.uk), and we will do our best to answer your query. We will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:

The Chair, Education Research Ethics Committee;
Email: student.curec@education.ox.ac.uk; Address: Department of Education, University of Oxford, 15 Norham Gardens, Oxford OX2 6PY, United Kingdom

The Chair, Social Sciences & Humanities Interdivisional Research Ethics Committee;
Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Boundary Brook House, Churchill Drive, Headington, Oxford OX3 7GB

13. Further Information and Contact Details

If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

Kathleen Kupiec
University of Oxford, Department of Education
15 Norham Gardens
Oxford OX2 6PY
United Kingdom
University email: kathleen.kupiec@education.ox.ac.uk

Appendix D

Consent Form for Museum Professionals' Interviews

Consent to take part in
Curating for creativity: Exploring practices at American children's museums

University of Oxford: Central University Research Ethics Committee (CUREC) approval reference: **CIA-2223-010**

Purpose of Study: This study aims to explore how children's museum professionals define, design for, and recognize child creativity during family visits.

	Please initial each box if you agree with the statement
I confirm that I have read and understand the information for the above research. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	
I understand that my participation is voluntary and that I am free to withdraw at any point March 31, 2023, without giving any reason.	
I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.	
I understand that I will not be identifiable from any research outputs, including publications and presentations.	
I consent to being audio recorded.	
I understand how audio recordings and museum exhibit photos will be used in research outputs.	
Use of quotations: Please indicate your preference (select *one* option): a) I do not wish to be quoted. **or** b) I agree to the use of quotations in research outputs if I am not identifiable.	a. b.
I understand how to raise a concern or make a complaint.	
I agree to take part.	

_____	_____	_____
Name of participant	Date	Signature
_____	_____	_____
Name of person taking consent	Date	Signature

Appendix E

Coding Framework: Study 2

1. **Children's Museum**
    - 1.1. Children's museum unique place
        - 1.1.1. From other museums or cultural institutions
        - 1.1.2. From home
        - 1.1.3. Relative to other children's museums
            - 1.1.3.1. Different from other children's museums
            - 1.1.3.2. Domain/area of focus that is unique
            - 1.1.3.3. Similar to other children's museums
        - 1.1.4. From school
        - 1.1.5. From playgrounds
        - 1.1.6. From 'the rest of life'
    - 1.2. Children's museum unique because
        - 1.2.1. Designed for children
            - 1.2.1.1. Ergonomically
            - 1.2.1.2. Ways of learning
        - 1.2.2. Engagement
            - 1.2.2.1. Playful
            - 1.2.2.2. Hands-on, exploratory, discovery-oriented
        - 1.2.3. Learning
            - 1.2.3.1. Open-ended
            - 1.2.3.2. Nontraditional
        - 1.2.4. 'Community hub'
        - 1.2.5. Fun
        - 1.2.6. New or unexcepted exposures
        - 1.2.7. Real tools
        - 1.2.8. Safe
        - 1.2.9. Work at own pace
        - 1.2.10. Less rules
        - 1.2.11. Facilitation
    - 1.3. Expansion
        - 1.3.1. Increasing inclusivity offerings
        - 1.3.2. Locations and geographic accessibility
        - 1.3.3. New exhibit space or programming
    - 1.4. Foundation for life
        - 1.4.1. Lifelong
        - 1.4.2. Career exploration
        - 1.4.3. Introduction to ideas or skills
        - 1.4.4. Seed for later
        - 1.4.5. Visitor feedback of extending beyond museum
    - 1.5. Museum target age

2. **Community**
    - 2.1. Visitor diversity
    - 2.2. Inclusive activity; diversity of offerings

2.3. Distinct place as a community need
2.4. Reflects community
    2.4.1. Physical space personalization opportunities
    2.4.2. Local people and themes
    2.4.3. Historical space and reclaimed materials
2.5. Coming together and collaborative
    2.5.1. Social skill development
    2.5.2. Modelling and inspiring others
2.6. Outreach
    2.6.1. Breaking barriers

3. Creativity
3.1. All creative in ways
3.2. Multiple ways to express
3.3. Defined in terms of
    3.3.1. Discovery
    3.3.2. Exploration
    3.3.3. Imagination
3.4. Example or anecdote used to define
    3.4.1. Museum-based
    3.4.2. From personal life
3.5. Process
3.6. Condition-dependent
    3.6.1. Variety
    3.6.2. Freedom
    3.6.3. Hands-on
3.7. Domain
    3.7.1. General
    3.7.2. More limited to art
3.8. New approaches or perspectives
3.9. Approach
3.10. 'Being creative'
3.11. Unique to individual
3.12. Joyful
3.13. Lifelong
3.14. Play
3.15. Problem solving
3.16. Skill-based
    3.16.1. Divergent thinking
    3.16.2. Using skills or past experiences
3.17. Spontaneous
3.18. Trying new things
3.19. Uninhibited, flexible
3.20. Child versus adult creativity
    3.20.1. Natural approach
    3.20.2. Developmental
    3.20.3. Different from adult

3.20.4. Same as adult
3.21. Learning
3.21.1. Alongside creativity
3.22. The museum as supportive versus nurturing
3.22.1. Not nurture creativity over time
3.22.2. Nurture on top of support moment

4. Exhibit
4.1. Unique from home
4.2. At home but unique here
4.3. Real-life links or contexts
4.4. Fun
4.5. Materials
4.5.1. Cross exhibit
4.5.2. Open-ended
4.5.3. Multi-sensory
4.5.4. Allows safe risk
4.5.5. Variety
4.5.6. Costumes
4.5.7. Interactive
4.5.8. Loose parts and props
4.5.8.1. Undefined
4.5.9. Messy
4.5.10. Intuitive
4.5.11. Keeping fresh
4.5.12. Display/organization
4.6. Creativity obstacles
4.6.1. Examples/prompts in space
4.6.2. Prescribed use
4.6.3. Goal-driven
4.6.3.1. Challenge
4.6.3.2. Competition
4.6.3.3. Reward
4.6.4. Heavily structured or guided
4.7. Technology
4.8. Creativity versus learning
4.9. Physical environment
4.9.1. Aesthetics
4.9.2. Ergonomics
4.9.3. Balance
4.9.4. Interactivity
4.9.5. Size and layout
4.9.6. Accessibility
4.10. Crowded
4.11. High creative space
4.11.1. Art
4.11.2. Building and making

5. Institution

5.1. Creativity undefined
5.2. Institutional ethos
5.2.1. Institutional board
5.2.2. Mission
5.2.2.1. In mission
5.2.2.2. Limited by mission
5.3. Staff creativity conversations
5.3.1. Explicitly or in forefront
5.4. Design starting point
5.4.1. Community need or trend
5.4.2. Fun
5.4.3. Funder
5.4.4. Includes creativity
5.4.5. Interesting
5.4.6. Learning goals
5.4.7. Mission alignment
5.4.8. Play goal
5.4.9. Safety
5.5. Institution resource limitations
5.5.1. Institutional time
5.5.2. Staffing
5.5.3. Money
5.6. Held responsible for safety
5.7. Partnership
5.7.1. Supportive
5.7.1.1. Artists-in-residence
5.7.1.2. Design or fabrication company
5.7.1.3. Other children's museums
5.7.1.4. Other cultural institutions
5.7.2. Restrictive
5.7.2.1. Corporate companies
5.7.2.2. University; trade school
5.7.2.3. Foundations
5.7.2.4. External organizations
5.7.3. Neutral
5.7.3.1. Donors
5.7.3.2. Government
5.7.3.3. Community members or organizations
5.7.3.4. Schools
5.7.3.5. Therapy

6. Staff

6.1. Personal reflections
6.2. Facilitation or guidance
6.2.1. Modes

6.2.1.1. Conversation
6.2.1.2. Play
6.2.1.3. Guided discovery
6.2.1.4. Open-ended exploration
6.2.2. What
6.2.2.1. Open-ended questions
6.2.2.2. Ask what child thinking
6.2.2.3. Prompts
6.2.2.4. Using museum materials
6.2.3. Manner
6.2.3.1. Light touch then recede
6.2.3.2. Guide without doing
6.2.3.3. Find child interest, meet child where at
6.2.4. Too much as obstacle
6.2.5. Targeted at parent
6.2.5.1. Only support to an extent
6.2.6. Depends on
6.2.6.1. The day and its visitors
6.2.6.2. Staff availability
6.2.6.3. Exhibit
6.2.6.3.1. No facilitation needed exhibits
6.2.6.3.2. Staffed space, always
6.2.6.4. Training
6.2.6.4.1. Some facilitators more skilled
6.3. Staff creativity
6.3.1. Not child
6.4. Understanding less involved parent

7. Child
7.1. Personality and individual view
7.2. Age, developmental stage
7.3. Background
7.4. Who they are visiting with
7.5. Prior experience, interests, favourite, continue
7.6. Prior visitation experience
7.7. Interest
7.8. Preferred type of play
7.9. Inclusion (mobility/neurodivergence)
7.10. Affect
7.10.1. Enjoy
7.10.2. Fun
7.10.3. Fear of failure/psychological safety
7.10.4. Joy
7.10.5. Pride
7.10.6. Serious
7.10.7. Shy
7.10.8. Wonder; awe

7.10.9. Frustration
7.11. Gender
7.12. Age divide
7.12.1. Youngest visitors different space
7.12.2. Programming age difference
7.12.3. Different building
7.12.4. Exhibit age intention
7.12.5. For everyone
7.12.5.1. Usage within changes
7.12.5.2. Different facilitation
7.12.6. Subject focus – makerspace vs art studio
7.13. Child 'activates' experience
7.13.1. Child activation
7.13.1.1. Autonomy, from open ended maybe
7.13.1.2. Child makes experience
7.13.1.3. Child-led
7.13.1.4. Not used as intended
7.13.2. Attracting rename motivation
7.13.2.1. Aspirational
7.13.2.2. Inspiration
7.13.2.3. Interest; hook
7.13.2.4. Motivation
7.13.3. Action
7.13.3.1. Discovery
7.13.3.2. Experimentation
7.13.3.3. Exploration
7.13.3.4. Imagination
7.13.3.5. Play
7.13.3.6. Problem solving

8. Caregiver
8.1. Depends on
8.1.1. Perceived safety
8.1.2. Open-endedness or unknown what to do at exhibit
8.1.3. Comfort
8.1.4. Familiarity with the materials/themes/novelty (stairs setting)
8.1.5. Visit frequency/museum experience
8.1.6. Misunderstanding what a children's museum is
8.1.7. Parent not knowing how to play
8.1.8. Exhibit design intention for individual/group; size
8.1.9. Signage
8.1.10. Child bid
8.1.11. Parent interests
8.1.12. Personal differences
8.1.13. Gender
8.1.14. Parent childhood, reminds of that
8.1.15. Parent; child's age

8.1.16. Cell phone use
8.1.17. Seating
8.1.17.1. Encourage from within
8.1.17.2. Discourage from without
8.2. Engagement behaviours
8.2.1. Mindfully engaged
8.2.1.1. Parent play in script; like in exhibit and with materials
8.2.1.2. Engaged nondirective
8.2.1.3. Parent initiate or prompt
8.2.1.4. Helping child
8.2.2. Mindlessly engaged
8.2.2.1. Controlling activity
8.2.2.2. Parent prompting, more closed-ended
8.2.2.3. Parent supervisory
8.2.2.4. Rush; parent-driven agenda; time
8.2.3. Mindfully disengaged
8.2.3.1. Learn about child
8.2.3.2. Parent own engagement
8.2.3.3. Parent creativity
8.2.3.4. Present but stepping back/watch play from outside
8.2.4. Mindlessly disengaged
8.2.4.1. Uninvolved with exhibit and child

9. Creativity-specific orientation efforts
9.1. Signal creativity
9.1.1. Creativity-titled space
9.1.2. Implicit in design and materials
9.1.3. Implicit in communications
9.1.4. Only for large groups
9.2. Facilitated by prompts and open-ended questions/activities
9.3. Directed towards parents
9.4. Signage

10. Evaluation
10.1. Collecting feedback/informing design change
10.2. Evaluation and research
10.2.1. No
10.2.2. Yes
10.3. Thinking or asking about 'creativity', not measuring

Appendix F

Intervention Designed as Initial Study 3 Methods

Study 3 was originally intended to be an intervention conducted during family visits to a children's museum. The purpose of this Appendix is to explain and detail its development.

Research Aims

Study 2 found that while American children's museums are well-designed for creativity during family visits, caregivers often hinder their children's creativity as a result of not being "mind-on". Museum visitors benefit from various forms of museum-provided orientation and guidance during their museum visits (Bitgood, 1994; Hooper-Greenhill, 1994; Loomis, 1987). Moreover, interactions *between* children's caregivers and the museum can support children (Bronfenbrenner, 1979). In fact, evidence suggests that museum-provided, resource-based interventions directed at caregivers can support parent-child interactions (Kupiec et al., 2023). This study intended to investigate whether a caregiver-directed physical resource with information about creativity and its importance (i.e., motivation) and behavioural skills suggestions, could support caregivers in becoming more "mind-on" in their behaviours during their children's exhibit engagement, and whether this would, in turn, result in greater child creativity.

This study also sought to understand what caregivers and children think about creativity, as well as whether specific conative-affective factors that previous research has shown to affect creativity (i.e., psychological safety, enjoyment, interest, intrinsic motivation) influence children's creativity at the children's museum (see Chapter Six). The lower age limit for this intervention was selected to be five years, such that children could self-report on items designed to measure these conative-affective factors. The upper age limit of eight years was informed by the upper age limit of the sub-construct of child creativity, as proposed and discussed in Chapter Six (see section 'Age'), as well as by Study 2 findings on children's museum target age ranges—selected so as not to go above the target age of most children's museums, particularly their "sweet spot" of visitation and engagement (see section 'The Children's Museum' in Chapter Seven). Finally, as this study was primarily designed to investigate elements of environmental influence and situation-

specific variables, the intervention resources and assessment tools were designed to be suitable for implementation across exhibit types.

Focusing on family visitors with one target child aged 5–8 years, this study planned to explore:

RQa: (How) can a resource-based, caregiver-directed intervention effectively increase caregivers' creativity-enhancing mindful behaviours during a family visit to the children's museum?

RQb: What type(s) of creativity do children engage in during children's museum play?

RQc: Do increased caregiver creativity-enhancing behaviours increase children's creativity?

RQd: Which factors contribute to differences in children's creativity?

RQe: What perceptions of child creativity do children's museum family visitors hold?

Intervention Resource

The intervention resource design was framed and informed by literature on wise interventions and the IMB model (see Chapter Eight). As such, a caregiver-directed resource (see Appendix H), the "seed", was constructed from literature review that provided key *information* about creativity that is most commonly misunderstood (i.e., creativity is for all domains, all people, malleable, and a process: Robinson, 2009), *motivation* in the form of why creativity is beneficial and the recognition that it is something caregivers have an ability to support, and *behavioural skills* suggestions for caregivers to utilise at the children's museum. Due to Study 2 findings (see Chapter Seven) that museum professionals want to respect less engaged caregivers, both hands-on and hands-off behavioural skills were provided as suggestions. In addition to the three core constructs of the IMB model, individuals also need to recognise the opportunity for the usefulness of even the most accepted intervention (Casale et al., 2023). Thus, the resource included explicit acknowledgement that children's museums offer a good opportunity for supporting and encouraging creativity.

Data Collection Focus

This work focuses on caregivers' creativity-enhancing behaviours and children's creativity as it unfolds during children's museum exhibit engagement. In addition, it seeks to examine how environmental and situational factors affect behaviour and creativity during

the museum visit. In line with these aims, data collection has been designed to target the influence of immediately present environmental (i.e., social and physical) and situationally elicited affective-conative factors on child creativity (See Figure F1). As such, factors that will not be included but, due to their relevance to caregivers' creativity-enhancing behaviours and children's creativity, would be of interest for future work include the following: caregiver, child, and/or family creative practices; caregiver and/or child creative self-beliefs (e.g., creative self-efficacy, creative self-concept, creative personal identity); caregiver and/or child personality (e.g., openness to experience, risk-taking, tolerance of ambiguity, preference for thinking concretely, sensitivity); caregiver and/or child creative achievements; caregiver and/or child trait motivation to engage in creativity; caregiver and/or child preferred modes of learning, working styles, and thinking styles; caregiver and/or child creativity domain activity preferences and/or prior performance and behaviours; parenting style and caregiver involvement/investment, including family practice beyond what is observable as in-museum behaviours; amount of caregiver-child play and caregiver's playfulness outside of the children's museum; child's social environment outside of the museum (e.g., how often caregiver models creativity, how encouraging children feel caregivers generally are); and child general cognitive abilities (e.g., working memory) and creativity-specific strategies (e.g., divergent thinking).

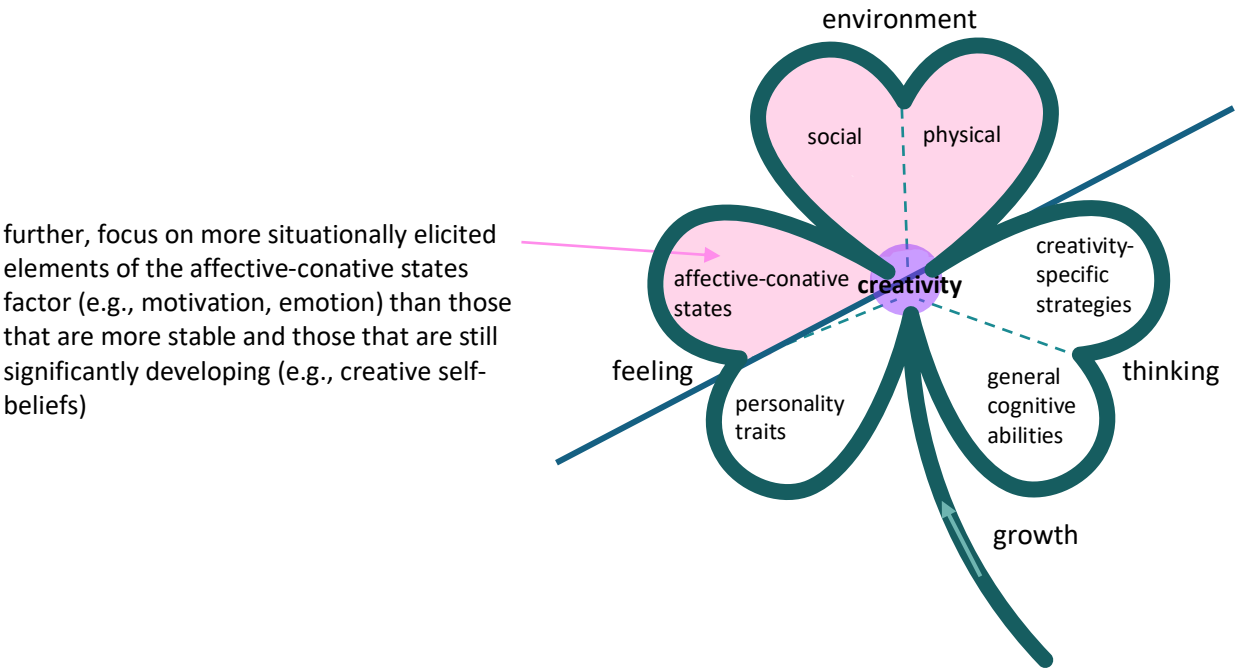
Data Collection Instruments

Interview findings on how children's museum professionals view children's creativity and caregivers' behaviours during children's museum visits (see Chapter Seven), evidence from literature review (see Chapters Three; see Chapter Six), and definitions and conceptualisations introduced throughout this thesis were used to inform the development of new tools that could assess caregivers' creativity-related behaviours and children's creativity during family visits to children's museums (i.e., an observational tool), as well as capture pertinent understandings, beliefs, and affective-conative information (i.e., caregiver and child questionnaires). The development of these instruments was further supported by existing play, creativity, and museum literature via current frameworks, observational tools and coding manuals, questionnaires, and empirical findings (Activation Lab, 2016; Amabile, 1989; Amabile et al., 1996; Al-Abdali & Al-Balushi, 2016; Anderson & Haney, 2021; Atzaba-Poria et al., 2014, as cited in Cabrera et al., 2017; Bright & Stockdale, 1984; Bustamante et al., 2020; Coulson & Burke, 2013; COVES, 2024; Cropley et al., 2019; Erätuuli & Sneider,

1990; Foutz & Emmons, 2017; Gajda, Beghetto, & Karwowski, 2017; Gregoriou, 2019; Karwowski, 2014; Karwowski et al., 2018; MakEval, 2008; Mayfield & Mayfield, 2010; Murcia et al., 2020; Nemiro et al., 2015; Robson, 2012, 2014; Ruscio et al., 1998; Pitts et al., 2018; Proctor & Burnett, 2004; Renzulli et al., 2013; Richardson & Mishra, 2018; Runco et al., 2001Russ, 1998 ; Schacter et al., 2006; Skard & Bundy, 2008; White et al., 2022; van Schijndel & Raijmakers, 2016).

Figure F1

Situational Influences for Intervention Data Collection Targets



Observational Tool

Measuring child creativity necessitates observation in play-based situations (see Appendix R). As a result, data collection to measure caregivers' creativity-related behaviours and children's creativity will take place *during* exhibit engagement. While family interactions might be artificially altered when they know that they are being observed as participants in a research study (Cohen et al., 2017), evidence from museum settings suggests that visiting groups typically do not behave artificially while participating in a museum study (Leinhardt & Knutson, 2004).

An observational tool was developed to measure caregivers' creativity-related behaviours, children's engagement and creativity, and how these sequentially unfold over the length of the observation. The tool begins with a few contextualising items to be filled out at the very beginning of the observation, which literature has suggested may influence visitors' engagement and (inter)actions with(in) museum exhibit spaces (see Chapter Three). Next, a set of items aims to explore caregivers' behaviours during the observation period and has been designed to not only include behaviours that are likely to support creativity but also those that are likely to hinder it. The next set of items has been developed to measure child creativity in two ways: a first set of items measures creativity-influencing processes (e.g., comfort, purpose, fluidity, collaboration, commitment), while another set of items have been designed to determine the degree of creativity (e.g., agency, conventionality, extension, complexity). High collaboration could also be utilised to indicate group creativity, but only if collaboration is together and simultaneous rather than inspired by. The following section of the tool indicates what type(s) of creative engagement(s) the child participated in during the observation. This has been included because creativity is expressed in many domains, exhibits offer different types of play, the visit is personal, and evidence suggests that, in adults, creativity differs by domain (e.g., Kaufman, 2012). The observational tool also has space to record which element(s) of the exhibit the child interacts with. Finally, as a process-oriented competency, field notes are especially important for creativity observations (Katz-Buonincontro & Anderson, 2020) and can document temporal and spatial contingency. Thus, there is space to record observation notes of the caregiver, the child, the exhibit environment, and their interactions in sequential order.

To further support the development of the observational tool, videos of parent-child interactions in a natural history museum, which had been recorded as part of a research study (Weisberg et al., 2023) and made available to researchers on Databrary (n.d.), and teacher-child interaction videos on Siren Films (n.d.) were used to reflect on initial caregiver behaviour items and child creativity dimensions. This resulted in fine-tuning of categories, their boundaries, and their coding manual descriptions.

The observational tool scoring template can be found in Appendix I and the detailed coding manual in Appendix J.

Questionnaires

Museum visitors may not always have the metaknowledge to describe their own informal learning (Diamond, 1999), and children, in particular, "may not be able to adequately verbalize their museum experiences" (Sanford, 2010, p. 67). Perhaps as a result of this, much museum research has relied on behaviours as learning indicators (e.g., Barriault & Pearson, 2010; Barriault & Rennie, 2019; Borun & Dristas, 1997; Foutz & Emmons, 2017; Sanford, 2010; van Schijndel et al., 2010). Although it has been proposed that behaviours do indicate museum learning (Borun & Dristas, 1997; van Schijndel et al., 2010), a positive relationship has not always been found (van Schijndel & Raijmakers, 2016). Thus, documenting museum conversation and/or using self-report measures can alleviate some of the risks of misinterpretation by overfocusing on actions and behaviours (Thomas & Anderson, 2013). As discussed in Chapters Two and Three, situational emotions during museum visits, such as those of belonging, comfort, and interest, vary between visitors and affect their museum experiences. In addition, as argued in Chapter Six (section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components'), children's creativity may be especially sensitive to environmental conditions and their affective-conative states, which include those experienced in response to a situation. Finally, wise interventions and the IMB model rest on individuals' beliefs and understandings. While these are important factors to consider and likely to influence caregivers' behaviours and children's creativity, they are more accurately reported by individuals themselves. Thus, while observations are able to capture some emotion-related process factors (e.g., frustration, persistence), after the observation phase, caregivers and children will each be asked to complete a questionnaire.

Caregiver Questionnaire

The caregiver questionnaire was designed as a paper-and-pencil questionnaire to be completed after the observation period. The first part of the questionnaire asks caregivers to report on their museum visitation habits with their children. The second set of items seeks to understand their levels of comfort and belonging, their perceptions of creativity during this specific children's museum visit and exhibit engagement, and whether this was the first exhibit they had visited, in order to account for museum fatigue and the influence of prior activity on creativity. The last item in this section gathers contextualising

information by asking caregivers to choose their motivation(s) for their visit, an area of significant interest and influence in visitor studies.

Rather than trying to infer caregiver engagement with the intervention materials during observation, caregivers in the intervention group are asked to self-report the extent to which they read the intervention resource: the "Spotlight on Creativity" information sheet (see Appendix H).

The caregiver questionnaire also includes a set of creativity items unrelated to the children's museum visit. First, caregivers are asked to define child creativity. Then, they are provided with a series of statements about creativity to rate on a 4-point Likert scale of (dis)agreement: strongly disagree, disagree, agree, strongly agree. These items were developed to map onto the IMB model constructs of information, motivation, and behavioural skills as a way to better understand not only whether the intervention resource would change caregivers' behaviours and/or children's creativity, but also which part of the behaviour change model maya have contributed to any significant changes. These statements were randomised. Caregivers are asked how they would define child creativity before completing the items related to information, motivation, and behavioural skills as an effort to mitigate the influence of creativity-related statements on their open-ended definition response.

Finally, as evidence suggests that museum visitation and caregiver-child interactions during exhibit engagement vary between sociodemographic groups, sociodemographic data is also collected. The choice was made to collect this information as the final set of questionnaire items as a way to help reduce the effects of survey fatigue, as sociodemographic items have become typical on surveys and would likely be more automatic in response.

Several rounds of feedback were gathered during development to refine and improve the caregiver questionnaire. First, the initial questionnaire was completed by three individuals to determine how long it would take to complete and to gather general feedback on the items. Changes were made and then cognitive interviews were used to further improve the questionnaire. A first cognitive interview was conducted, and this highlighted several key changes that needed to be made. These edits were completed and then five additional cognitive interviews were conducted to find out how well the items were understood, whether they were interpreted as they were intended and responded to in a

way that captured what they intended to, and to check that they were able to generate meaningfully different responses between individuals, particularly with the 4-point Likert scales. Several items required fine-tuning of word choice after this process. Finally, the 'Document stats' function within the 'Editor' pane of Microsoft Word (Microsoft Corporation, 2021) was used to verify that the Flesch-Kincaid Grade Level of the questionnaire was 8 or below. (See Appendix G)

Child Questionnaire

Similar to the caregiver questionnaire, the child questionnaire was developed to be completed after the observation period. However, while the caregiver questionnaire is administered in a paper-and-pencil format for caregivers to complete independently, the child questionnaire is administered by the researcher. To account for and investigate the influence of affective-conative states on children's creativity (see Chapter Six), this questionnaire was developed to measure children's emotional states (valence and activation) during exhibit play, the degree to which they were personally interested in the exhibit and its materials, the extent to how intrinsically motivated they felt playing in the exhibit, and how restrictive they felt the environment to be. In addition, little research to date has explored what creativity means to children themselves. As a result, to better understand children's perception of "creativity", children are asked what they think creativity means. Finally, they are asked about their recognition of the children's museum as an opportunity for them to be creativity, whether they recognise their own creativity during engagement, and what museum design and/or practices might enhance their creativity.

During questionnaire development, all word choices were carefully made with a best effort to ensure that children in the 5–8-year-old age range would understand them. These decisions were informed by Age-of-Acquisition age ratings by Kuperman et al. (2012) and emotion word comprehension findings by Baron-Cohen et al. (2010) (See Appendix K). Response formats were designed to be interactive in order to provide children with a non-verbal way to respond. Additionally, the response format changes several times across the researcher's administration of the questionnaire in an effort to hold young children's attention, with practice items after each response format change. (See Appendix L)

Appendix G

Intervention Post-Observation Caregiver Questionnaire

Script when giving caregiver the questionnaire: Even if you came with more than one child today or if you visit museums, including the [insert children's museum name], with other children, think about [participating child's name] while you are answering these questions.

Thank you for taking the time to answer these questions!
There are 2 sheets, each with a front and back.

1. Please list all the museums that you and your child have visited in the past year. This can include places such as children's museums, art museums, natural history museums, science centers, historic homes, zoos, aquariums, and botanical gardens.

   _____

   _____

   _____

2. Including today, how many times have *you* visited *[insert children's museum name]* in the past 6 months?

   ____

3. Including today, how many times has *your child* visited *[insert children's museum name]* in the past 6 months? ____
4. Including today, how many times have *you played with your child* in *[name of exhibit]* in the past 6 months? ____
5. Was *[name of exhibit]* the first exhibit space you visited today? (please circle) yes no

Please circle the response that most represents how you feel about each statement listed below.

6. I feel welcome at *[insert children's museum name]* today.	strongly disagree	disagree	agree	strongly agree
7. My child feels at ease playing at *[insert children's museum name].*	strongly disagree	disagree	agree	strongly agree
8. I feel at ease playing with my child at *[insert children's museum name].*	strongly disagree	disagree	agree	strongly agree
9. I enjoyed being in *[name of exhibit]* with my child today.	strongly disagree	disagree	agree	strongly agree
10. There is a right way to play at children's museums.	strongly disagree	disagree	agree	strongly agree
11. *[Name of exhibit]* was a good environment for my child to express their creativity.	strongly disagree	disagree	agree	strongly agree
12. When we arrived at the children's museum today, I was thinking about my child's creativity.	strongly disagree	disagree	agree	strongly agree

13. My child was creative in *[name of exhibit]* today.	strongly disagree	disagree	agree	strongly agree

14. We are really interested in creativity. In this study, we are hoping to learn more about **child creativity**. Could you help us better understand how adults think about it by telling us what **child creativity** means to you? There is no right answer.

    _____

    _____

    _____

15. **Intervention group only:** Did you use the '**Did you know?** A Spotlight on *Creativity'* sheet you were given today?

    ___ No.
    ___ Yes, but I only skimmed it.
    ___ Yes, I read it.
    ___ Yes, I read it and referred back to it during our time in the exhibit.

16. Why did you decide to visit *[insert children's museum name*] today? Please select up to 3 of the *most important* reasons you decided to visit.

    ___ To spend time together as a group/family
    ___ My child(ren) asked to come
    ___ To participate in a specific program or activity
    ___ For an educational experience for child(ren)
    ___ For fun/entertainment for child(ren)
    ___ Wanted something to do because we couldn't do what we typically do, such as due to poor weather or a school holiday
    ___ For my child(ren) to have a new experience/do something we can't elsewhere
    ___ Because that's what good parents do
    ___ Because it's a safe place for my child(ren) to play
    ___ To give my child(ren) an opportunity to play with other children
    ___ Had a free pass/coupon
    ___ It was recommended to me
    ___ Other: _____

Please circle the response that most represents how you feel about each statement listed below.

17. Being creative plays a role in determining a person's future success in working life.	strongly disagree	disagree	agree	strongly agree
18. If someone is really creative in one area of their life, they will be more creative in all areas.	strongly disagree	disagree	agree	strongly agree
19. Daydreaming is a waste of time.	strongly disagree	disagree	agree	strongly agree
20. With the right conditions, everyone can be creative.	strongly disagree	disagree	agree	strongly agree
21. I am able to be flexible and follow my child's lead when we are playing together.	strongly disagree	disagree	agree	strongly agree
22. To be creative, effort is more important than natural talent.	strongly disagree	disagree	agree	strongly agree
23. I feel confident expressing my own creativity.	strongly disagree	disagree	agree	strongly agree
24. It's easy for me to stand back and support my child in taking sensible risks.	strongly disagree	disagree	agree	strongly agree
25. Creativity doesn't take much time—it happens with a lightbulb or 'aha!' moment.	strongly disagree	disagree	agree	strongly agree
26. I find it difficult to be open to my child's impractical or wild ideas.	strongly disagree	disagree	agree	strongly agree
27. Truly creative people must be born that way.	strongly disagree	disagree	agree	strongly agree
28. I know questions I can ask my child to help them think of different possibilities or from different perspectives.	strongly disagree	disagree	agree	strongly agree
29. I want my child to have opportunities to use their creativity *every* day.	strongly disagree	disagree	agree	strongly agree
30. Creativity might happen in other subjects or during other activities, but art is the most creative.	strongly disagree	disagree	agree	strongly agree
31. It's important to give my child a variety of different experiences.	strongly disagree	disagree	agree	strongly agree
32. Creative activities are okay as hobbies, but more time should be spent on learning factual knowledge.	strongly disagree	disagree	agree	strongly agree
33. Being creative supports a person's overall well-being.	strongly disagree	disagree	agree	strongly agree

34. I have strategies for helping my child manage their frustration and try again when their solution doesn't work.	strongly disagree	disagree	agree	strongly agree
35. The more intelligent someone is, the more creative they are.	strongly disagree	disagree	agree	strongly agree
36. I am confident in my abilities to support my child's creativity.	strongly disagree	disagree	agree	strongly agree
37. It's important to encourage creative thoughts and activities.	strongly disagree	disagree	agree	strongly agree

38. Your age (please circle): 25-30 31-35 36-40 41-45 46-50 51-55 56-60 60+
39. Your child's birth month: _____ and year: _____
40. Your gender: _____
41. Your child's gender: _____
42. Your zip code: _____
43. Including yourself, how many adults are in your visiting group today? _____
44. Including your child that is participating in this study with you, how many children are in your visiting group today? _____
45. What is your relationship to your child (e.g., father, grandmother, uncle)? _____
46. Which of the following categories best represents your highest level of completed education?
    - ___ No high school diploma
    - ___ High school diploma
    - ___ Associate's degree
    - ___ Bachelor's degree
    - ___ Master's degree
    - ___ Ph.D. or professional degree (e.g., M.D. or J.D.)
    - ___ Prefer not to say
47. Which racial or ethnic group(s) do you identify with? Select all that apply.
    - ___ American Indian or Alaskan Native
    - ___ Asian
    - ___ Black or African American
    - ___ Hispanic or Latinx
    - ___ Native Hawaiian or Pacific Islander
    - ___ White or Caucasian
    - ___ Not listed here: _____
    - ___ Prefer not to say

Appendix H

Caregiver Intervention Resource

Did you know?

a spotlight on *creativity*

Creativity is related to many important benefits, including academic achievement, employability, societal advancement, resilience, well-being, and life-flourishing.

A lot of people think of *art* when they hear 'creativity', but creativity is in *all* areas of life! Creativity can also be in problem-solving, telling jokes, building and tinkering, make-believe, and more.

Creativity is for everyone, and everyone is creative—including you and your child! We aren't born with a certain amount of creativity. You can help your child develop theirs!

Some environments hinder creativity. Others support it. The children's museum is designed for interactive and safe open-ended play. It's also filled with all sorts of materials and props that your child might not get to play with anywhere else. These characteristics encourage creativity.

To support your child's creativity, you could:

- Ask your child questions like "What if…?" "Do you have any more ideas?" "How else might we…?" and "Then what?"
- Encourage your child by telling them "this is a place where we can be creative" or "it's okay to try out different ideas here, even if they don't work".
- Tap into your own creativity—we're all here to play!
- Allow your child to choose an activity and play at their own pace. There is a lot to see and do, but you don't have to visit all the exhibits in one visit—creativity is a process.
- Let your child know "it's okay" if things get a little messy while they're playing. We're very hands-on.

Appendix I

Caregiver-Child Creativity Observation Scoring Template

Crowdedness: low/medium/high Organization of exhibit materials at start: low/medium/high
Approximate age of most other children in exhibit: under 3/3-4/5+/none
Any part(s) of the exhibit not in working order or closed: _____

Caregiver:

Behaviour	Yes
Models	
Prompts	
Values	
Encourages	
Supports	
Connects	
Caring	
(R) Critical	
(R) Restricts	
(R) Interrupts	
(R) Ignores	

Involvement: uninvolved distant interacting interactivity
Attention: away from museum self passive active
Approach: unengaged instructive concrete playful
Technology use: none low mid high
Type: _____

Child:

Dimension	Low	Mix	High
Comfort			
Purpose			
Fluidity			
Agency			
Collaboration			
Conventionality			
Commitment			
Extension			
Complexity			

Creative Engagement	Yes
Narrative	
Problem-solving	
Building and making	
Physical	
Arts	
Ideation	
Emotionally expressive	
Object-based	

Which part(s) of the exhibit did the child play at?
[options to be added, specific to observed exhibit]

Observation Notes: details of engagement, in sequence:

Observation duration: _____ min _____ sec

Observation duration: _____ min _____ sec

Appendix J

Caregiver-Child Creativity Observation Detailed Coding Manual

Contextual Factor	**Detailed Description**
Crowdedness	*Low*: No visitors aside from participating family are in the space. *Medium*: Other visitors are present, but this does not interfere with being able to choose and move freely through the space. *High*: A lot of activity is happening around the participant. It is difficult to get a space doing what someone might want to do or being able to use the materials they might want to use. Needing to share, wait, or take turns.
Organisation of exhibit materials at start of observation	*Low*: Many exhibit materials have been taken out, including that they are scattered and/or in different parts of the exhibit than they are intended for. The exhibit space has a lot of used materials and may also have a high number of other visitors' completed or in-progress projects and products. *Medium*: Some exhibit materials have been used and are out, but they are not scattered. Some activities may be partially complete. *High*: This is how the exhibit would appear at the very beginning of the day. Materials are where they belong or have been intended by museum design. Some examples might be available to spark ideas, but there are no completed, in-progress, or attempted constructions or works by other visitors.

Caregiver Behaviour	**Detailed Description for Coding 'Yes'**
Models	The caregiver is being creative themself. This is a hands-on engagement. Examples of what would be included in this are engaging in their own building with materials, experimenting and problem-solving with materials rather than simply directing or prompting the child, pretending or taking on a role such as putting on a costume or expressing a character's thoughts and feelings, thinking aloud through wondering about alternative ideas or perspectives for child to hear, and telling jokes. This can be done on the caregiver's own and parallel to but not in interaction with the child, as long as it is done in a way that is close enough for the child to be aware of. When done with the child and going along with their ideas, modelling must include elaborating on their child's idea(s); it does not include when the caregiver takes their child's idea and follows child-direction without extending in some form. Caregiver modelling of creative behaviour also does not include when the caregiver engages with a goal-directed exhibit by only following directions, examples, or prompts that have been already provided.

Prompts	The caregiver provides jumping off points for their child's activities and thinking. Prompting does not include giving explicit directions (e.g., "put that here") but rather offering suggestions or asking open-ended questions and then allowing their child to take their own action (e.g., "let's see what happens" or "why don't you try?"). Prompting can also be showing examples; however, to be a prompt, sharing examples does not include caregivers encouraging their child to exactly follow and re-create or imitate something. Prompting also includes when a caregiver poses appropriate and constructive challenges, and these can come directly from museum prompting (i.e., supportive signage) or something the caregiver has thought of; however, it does not include competitive goals (see 'Critical'), providing a closed-ended goal, or insisting on a single approach (see 'Restricts'). The caregiver may provide clear expectations or helps their child get started and then steps back to let their child work on their own and then show/explain afterwards.
Values	The caregiver shares with the child that creativity is valued during their play, including by verbally validating creativity. Behaviours for doing this would include encouraging the child by praising unique ideas and creative effort and showing appreciation of applying prior knowledge and/or trying out new uses. This does not include simple praise such as "good job" or praising a child's intelligence such as "you're so smart." Valuing creativity also includes explicitly instructing for its utilisation, such as when the caregiver tells their child "this is a place where we can be creative", "use your imagination", or "it's okay to try out different ideas here, even if they don't work." The caregiver can also express that creativity is valued in non-verbal ways, including stepping back and giving their child time to complete an activity or task on their own or listening to their child's ideas and allowing their child to take initiative and explore these, even if the caregiver has already made a different suggestion.
Encourages	The caregiver remains open to their child's ideas and views, even when they are unconventional, wild, or impractical. The caregiver accepts uncertainty, tolerates ambiguity of their child's process, and allows their child to pursue further. The caregiver lets their child choose the activity and/or how to approach and engage with it, facilitates exploration or experimentation, promotes their child attempting things even if they won't work, and helps their child handle mistakes and frustration, including assuring their child that "there's no wrong way or answer." The caregiver asks their child for their thought process as a way to understand. They are also able to identify and help surmount obstacles, help the child with self-evaluation, and encourage ways to try again. The caregiver might draw attention to

	materials and discoveries or make suggestions, but then allow the child to incorporate them how they want to.
Supports	The caregiver helps their child in generating ideas and thinking in different ways, different directions, or from different perspectives. This can happen as a way to extend the child's thinking and engagement or to encourage them to try again after an error. This can be done through open-ended questions, questioning assumptions, answering questions with questions, and using counterfactual or conditional language. Examples include "Why?" "What if…?" "How about…?" "How else might we…?" "How could…?" "Then what?" "Okay, what else?" "Could be…" and "Do you have any more ideas?" This does not include closed-ended questions such as "How many?" or factual knowledge quizzes such as "Do you know…?" Supporting also includes when a caregiver gives suggestions but not directions or answers when their child is hesitant, as a way to initiate their child's engagement or guide their child in figuring something out.
Connects	The caregiver offers a connection between what their child is doing, focused on, or engaged with and their child's prior experiences or current understandings. These links to life can include recounting memories, drawing upon a shared history, bringing in familiar knowledge, connecting ideas from different domains, discussing aspects of a familiar environment, or referencing something in another exhibit. This can be done through examples, prompts, analogies, and metaphors.
Caring	The caregiver has a positive interaction style, supported by positive communication. This includes active listening, such as following up on their child's ideas, being responsive to what their child says and shares, exhibiting patience for what might appear aimless wandering or daydreaming, respecting and/or taking interest in their child's interest, smiling frequently at their child, speaking with a positive tone, showing affection, being supportive of and sensitive to their child's emotions, and accepting their child's bids to join in play.
(R) Critical	The caregiver is not open-minded towards their child's ideas and/or ways of playing. This includes evaluating or judging their child's actions or ideas and by openly comparing their child or their child's play to others, to provided examples, or to an "ideal". Another way of being of critical is a caregiver telling their child that they are wrong, particularly in open-ended activities. Being critical also includes when the caregiver poses a challenge that creates competition within an activity.
(R) Restricts	The caregiver acts rigidly in a way that prevents their child from having autonomy, free-choice, and agency. Restrictive behaviours include the caregiver choosing activities, giving directions, and teaching ideas or explaining concepts without allowing their child to experiment or explore for themselves. This

	can also be observed when caregivers impose overly strict rules, repeat rules often, and intervene to modify their child's behaviour in a way that is related to conduct but not necessary. Thus, while restricting represents too much surveillance, it does not include intervening for safety reasons; instead, it reflects not exercising thoughtful confidence in their child. A caregiver is restrictive when they do not allow their child to make flexible use of the space and do not tolerate appropriate levels of mess or noise during play. Thus, restricting behaviours can also be seen in a caregiver that does not allow their child to combine disparate elements of an exhibit or to explore further, such as wandering within the space or moving to other parts of the exhibit when the child appears ready or expresses the desire to do so. Restrictive behaviours can represent an overly cautious caregiver who prevents sensible risk or a very goal-oriented caregiver who tells the child how they "should" be doing something that is open-ended, including imposing ideas, structure, or their own goals rather than suggesting and allowing their child to choose.
(R) Interrupts	The caregiver does not allow their child to follow their own interests or complete activities that they are already engaged in at their own pace. The caregiver can do this in various ways, including expressing impatience; imposing their own agenda on top of their child's plan; talking over their child; taking over an activity to complete actions for/instead of their child, even when their child is showing interest and/or a willingness to try; and rushing their child to another activity or part of the museum when they do not yet appear ready.
(R) Ignores	When not engaged already, the caregiver rejects their child's bids to join in their play or activity, or the caregiver does not intervene or offer support when it would be appropriate, such as when a child is displaying difficulty or frustration and needing or wanting help. When engaged, this could be seen in a caregiver who does not allow their child opportunities to share their ideas and views or, if shared, rejects or fails to acknowledge and respond to their child's contributions.

Caregiver Behaviour	**Detailed Description, coded based on best fit in consideration of the full observation period**
Involvement	*Uninvolved*: Not involved with their child or the museum, such as sitting on bench by oneself while their child plays. *Distant*: Interested in and watching their child or keeping an eye on them, but doing so from a distance and without sharing immediate space and materials, conversation, or non-verbal cues with their child. *Interacting*: Interacting with their child and/or their child's play. The caregiver engages in verbal exchanges but does not extend

	their child's activities or ideas. Occasional joint attention, shared thinking, or eye contact. Occasional manipulation of exhibit materials, but these tend to be shallow, surface-level engagements. Greater focus on responding to their child than initiating with their child. *Interactivity*: Consistently high levels of interacting with their child and the materials or task at hand. Exhibit engagements tend to be longer, deeper, and more responsive to changing circumstances. Engages in serve and return verbal exchanges and extends their child's activities and conversation. Shows consistent joint attention, shared thinking, or eye contact. In addition to responding to their child, caregivers initiate. *Note*: Involvement can be positive (e.g., putting on a costume to role-play with their child) or negative (e.g., completing an action on behalf of their child instead of allowing their child to do so).
Attention	*Away*: Attention is directed away from museum activity (e.g., cell phone, book). *Self*: Attention is directed within the museum but not at their child (e.g., talking with another person, looking at a different part of the exhibit than their child is playing at). *Passive*: Physically present with their child or watching their child and following along, but in a neutral way (e.g., not pursuing their child's interests or play, but rather remaining present for safety and behaviour monitoring purposes). *Active*: Attending to their child and their child's play, such as responding to their child's interests and joining their child's agenda or what their child is doing or working on. This means participating with how their child is engaging and what they are playing with/working on (e.g., helping their child, offering encouragement, role-playing with their child, carefully watching their child take safe risks).
Approach	*Unengaged*: Not paying attention to their child or their child's play. *Instructive*: Engaged with their child, but for the purposes of directing, instructing, or managing their child. *Concrete*: Engaged with their child's activity, but for the purpose of concrete comments, such as labelling, telling facts, or giving explanations. This can also be when the caregiver quizzes the child for factual information or asks forced-choice questions. There may be turn-taking but it does not extend the play frame, such as following an expected script, using props in a conventional way, or completing simple directions from their child that are tangential to the play (e.g., holding something). *Playful*: Serving as a co-player or co-investigator by playing with their child from within their child's play frame. Assumes a collaborative and complementary role to their child's, with joint

	participation and idea sharing. Imagines, wonders, pretends, and experiments with their child.
Technology Use	Bustamante et al., 2020, Table S3: "Coded as None, Low, Mid, or High. Observer do not make a value judgment on technology use, but note the type of device and what activity it is used for (taking a picture, reading with child, reading independently, etc.). None is zero technology use. Low is a few brief instances of technology use (glancing at the time on a cell phone, or checking a text). Mid is a short engaged technology use (writing a text/email for 30 seconds). High is defined as long periods of engaged technology use (taking a phone call for several minutes, spending multiple minutes on social media etc.)"

Child Creativity Dimension	**Low**	**High**
Comfort	The child approaches the exhibit with some apprehension or hesitations, interacts timidly or nervously with materials and props, has difficulty joining in if others are already playing in the space, gives up when they make an error or do not understand, or seeks validation or (re)assurance. The child might also express a fear of failure or doing an activity the wrong way.	The child appears relaxed, has an easy time diving in and engaging with activities and materials, makes seamless transitions (e.g., between activities, tasks, or materials), feels safe to take risks by exploring ideas to the edge or trying again after failure. The child can tolerate uncertainty and flexibly adapt to new circumstances, improvisation, or change. The child also works through frustration and shows willingness to pursue discovery or complete tasks and activities.
Purpose	The child behaves in spontaneous or impulsive ways, such as by jumping into activities, working hastily, and moving on quickly with little indication that they have "completed" what they set out to do. The child does not seem to have a goal in mind but rather engages with joy in the process of doing the activity. This could be seen by repetition or remaining focused on materials and tools themselves, rather than using them together to accomplish a higher goal than discovery. This	The child is intentional in that they approach their play with a clear purpose. This can be evidenced by, for example, discussing plans, engaging in goal-oriented tasks (e.g., problem-solving), or setting up a play frame and announcing roles within it. The child moves beyond discovering features to manipulating them and putting them into use through trial-and-error to make progress towards a product. They may show self-satisfaction, pride, or relief upon completion of what they were trying to accomplish or share new

	may appear to be more exploratory than productive.	information as they seek to understand rather than just do. They may also display an orientation towards generativity by sharing a finished result before moving on to another activity.
Fluidity	The child is deliberate in their engagement. They take time to reflect or pause, such as considering options or weighing ideas against each other. They might step back to wonder or explore the exhibit space before jumping in and engaging with something within it.	The child behaves spontaneously. They think on their feet to adapt to new circumstances or a change in situation easily and quickly, such as in improvisation. They are able to quickly recognise the applicability of a new idea or concept, flexibly incorporate others' ideas, develop alternative directions, tolerate uncertainty, and handle ambiguity.
Agency	The child follows more than they lead. The child might observe others first or need suggestions and/or support from their caregiver to get involved in play or choose what to do. The child seeks out help or directions. This can be seen through play that reflects imitation, replication, repetition, or reproduction, where a child acts and does without change, personalisation, or incorporating alternatives. This can also be seen when the child accepts others' ideas without changing or extending them, follows instructions, sticks to a play frame or rules set by others, or builds on an existing creation rather than being inspired by it to build differently. The child might also ask how something should be done in tasks and activities that are not pre-defined; however, this would not include how to use a specific tool or exhibit material/component.	The child displays self-belief and self-confidence, takes initiative, and might lead others. The child acts with confidence and decisiveness in their own personal choices and does not need time or prompting to engage with play. The child may also negotiate play frames and offer others' roles or direct their participation (e.g., role, actions, behaviours, script) by imposing scope, rules, and/or goals to a shared activity. The child might lead a joint activity and model how to do something to their caregiver. The child is willing to try differently. The child may engage with others' ideas or examples without replicating them but rather modifying or transforming them into their own personal versions.
Collaboration	The child plays in solitude and prefers to do their own activity. They do not mind if/when their	The child is very social. This can include playing with the members of their visiting group. If their

	caregiver is less involved or disengaged. They might even tell their caregiver to stop doing something so that they can do it independently. The child does not get involved in what is developing around them. They exhibit frustration in sharing materials or props. They might attempt to direct others but not consider or incorporate others' ideas or contributions. The child may freely choose to engage with smaller scale exhibit elements rather than those that are multi-user, as a way to play solitarily.	caregiver is not involved or paying attention, they might make bids for their caregiver's attention, ask for help, or invite them into the play. The child might approach other visitors, engage in play that others are participating in, play cooperatively, and incorporate or build on others' ideas and suggestions. The child may engage with other guests' creations to expand or extend upon them, even if that other guest is no longer present. As such, collaboration can be seen in both a child directly working together with at least one other person *or* engaging independently but in a way that is mediated by others' expressions.
Conventionality	The child does the unexpected by breaking script or moving beyond functional fixedness of provided materials and props (e.g., a stick is used as a fishing rod). The child might also introduce new themes, draw far connections between ideas, and engage in a high level of imagination, pretending, or make-believe with storylines that fall outside of a familiar script typical of day-to-day encounters and experiences. This can also be evidenced when the caregiver expresses surprise at something the child does or shares. The child challenges assumptions and manipulates tools and materials in ways that use these things differently from how the exhibit was designed and/or intended.	The child uses the exhibit and materials in a way that is expected of suggested by its design. The child follows a more or less predictable or "everyday" script, such as re-enacting typical or familiar roles (e.g., pretending to cook in a kitchen) over fantasy roles (e.g., pretending to be a pirate on a ship). The child displays concrete engagement, such that they may engage with materials and props in ways that maintain functional fixedness (e.g., a cup is used to pretend drink from). The child may correct others about how they should be using materials and props. The child integrates reminisced anchors over newly imagined possibilities. High conventionality also includes imitating what others might be doing in the space or replicating an example provided by the museum instead of personalising it.

Commitment	The child may either be sporadically on task or not very active in an exhibit space. The child may make frequent transitions, move quickly from one thing to the next without apparent connection, be easily distracted, or appear off task. The child gives up in response to difficulty by showing disappointment or leaving activity. The child has a sudden or premature moment of disengagement after a period of engagement. The child may also appear bored, disinterested, or withdrawn. The child might watch others or touch materials, but without deep or long engagement. Low commitment typically results in shorter exhibit engagements.	The child sustains play and displays concentration. They appear engrossed, focused, invested, or absorbed in what they are doing. The child might talk through something or correct themself. The child retains their play frame or sticks with their task, even with distractions. The child displays determination in response to difficulty by persisting or trying again in another way. This typically results in longer exhibit engagements, but high commitment can be determined by long duration and/or high intensity.
Extension	The child does not elaborate within individual play frames or extend their interactions after an initial engagement. The child could show this by finishing one task or episode within the play frame and then moving to another activity or establishing a different play frame. In addition, the child may note a connection to their life but not pursue it further. The child might also reiterate or end their engagement with an activity rather than progressing it, such as by repeating the same actions even when they do not work or disengaging after a single attempt at an open-ended activity rather than engaging in trial-and-error. Low extension typically results in shorter exhibit engagements.	The child extends their initial activity in a way that develops their play (e.g., writing down the ingredients of a pretend recipe that they just "prepared" while pretending to be a chef) or that incorporates new materials or fresh ideas (e.g., incorporating a recollected memory). This could also result from using or building on new knowledge as it is being learned, such as during trial-and-error. As such, high extension can be marked by a child either deepening and elaborating on their current activity or laterally transferring to a related process with a clear point of connection. This typically results in longer exhibit engagements.
Complexity	The child uses few and/or a low variety of things, props, materials, and ideas. The child might engage intently with one exhibit material. When they engage with several exhibit materials, they do so	The child uses many and/or a high variety of things, props, materials, and ideas. The child combines and incorporates exhibit materials and ideas, and their story or project may evolve. The child can cope

	passively instead of using them in combination. When the child has a new idea, they might end their current engagement to pursue it rather than endeavouring to connect it to what they are already engaged with. When the child engages in role-play, they stick to playing out a familiar script rather than improvising or changing it.	with multiple ideas at the same time and may put them together. When repeating or trying again, the child tries differently rather than reiterating. The child may express imagined and pretend affect or emotional states of embodied roles. High complexity is also marked by far connection, which typically involves a displacement of time *and* context (e.g., using a stick as a fishing rod and a leaf as a fish, necessitating that the child brings both the behaviour *and the idea*, rather than simply using a plastic fishing rod to pretend they are fishing).

Child Creative Engagement	**Detailed Description for Coding 'Yes'**
Narrative	The child uses narrative or storytelling to play, guide their activities, or explain what they are doing. For example, the child enacts an imagined role, such as during make-believe, fantasy, or dramatic play. This would not include putting on a costume without entering that script, embodying that role, or taking on that perspective. This would also include telling a story through another's perspective (e.g., a puppet show, acting on a theatre stage) and telling a story with their materials as if narrating, such as adding figurines or dolls to a house they have built with blocks and acting out a story through these.
Problem-solving	The child has a goal-driven way of adapting ideas, seeing different points of view, or trying different ways of doing, but explores flexibly to reach that goal. The child engages with experimentation by playing with possibilities, investigating, or tinkering, and then builds on their emerging discoveries. The child displays trial-and-error by testing out ideas or playing with different combinations. This does not include merely touching things or pressing buttons, but is instead marked by doing something with a level of direction, such as discovering cause and effect through manipulating materials.
Building and making	The child uses exhibit materials to construct something. This includes activities such as using tools and building with blocks; this does not include artistic expressions (coded as 'Arts' below).
Physical	The child explores the physical space of the exhibit and uses their senses as a way of engaging. This includes moving their body in different ways, such as through dance or jumping over things. This also includes physical sensations, such as a child

	announcing a material is sticky or slimy. This can be expressed through gestures and physical actions during role-play; for example, crawling when pretending to be a dog.
Arts	The child engages in expression through arts or crafts. This includes open-ended activities, such as playing with and discovering the properties of colours and colour mixing. It also includes more product-oriented activities that use various mediums, such as a child painting, drawing, or sculpting something specific (e.g., "I'm going to paint a flower"). This can include playing music or writing, such as poetry. However, this excludes dance (see 'Physical') and theatre (see 'Narrative').
Ideation	The child engages more abstractly than concretely, such as by playing with ideas. A child can engage in ideation by wondering, speculating, problem finding, proposing "as if" or "what if", and attempting explanations over descriptions (moving from "it is" to "why" and "what could be"). This includes when the child brainstorms, recognises and articulates disparate connections, considers alternatives without yet choosing or acting on one, imagines multiple perspectives, or identifies multiple directions to pursue. Ideation is exemplified by a child making connections between what they are doing and their previous experiences or familiar contexts. Ideation can also be when a child thinks on their feet to recognise the applicability of a new idea or concept or when they incorporate others' ideas, even if this develops the play or activity in a new direction. Another example would be developing a game and proposing new rules or sharing a storyline *before* engaging in an activity.
Emotionally expressive	The child combines their ideas with emotion within or strongly connected to the play frame. This includes episodes where the child embodies the emotional state of the role they are playing (e.g., crying while pretending to be a baby). This must happen as part of the play frame and, thus, does not include emotion expressed *in response* to something happening in the play frame (e.g., expressing frustration that the tower they were building fell over). When outside of the play frame but in reference to it, this can include humour and telling jokes.
Object-based	The child uses materials or props to embellish their play. This can happen during a larger play frame (see 'Narrative') or as a single occurrence. When part of a larger script or performance, this can be done by using exhibit materials as intended (e.g., pretending a stuffed animal is sick at the vet). It can also be when a child overcomes functional fixedness by using materials or props in ways that they are not intended or to fulfil different uses than they might traditionally be associated with (e.g., using a pot as a drum, using a plastic hat as a cup to drink water from).

Appendix K

Intervention Post-Observation Child Questionnaire

The child seemed frustrated disappointed content very willing to pause play for questionnaire.

The child's mood appeared negative neutral positive when beginning questionnaire.

Additional notes: _____

_____

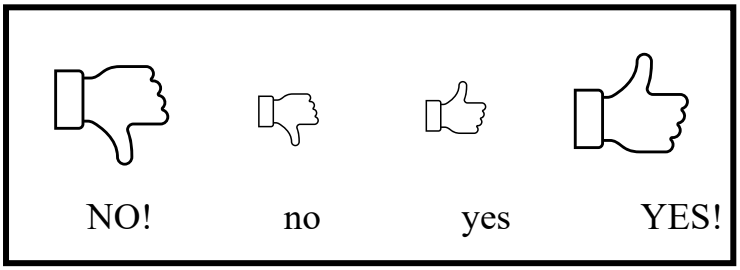
Response format: children will give two thumbs up, one thumb up, one thumb down, or two thumbs down.

1. I felt happy playing in *[exhibit name]* today.	-2 -1 1 2	emotion
2. I felt silly playing in *[exhibit name]* today.	-2 -1 1 2	emotion
3. I felt sad playing in *[exhibit name]* today.	-2 -1 1 2	emotion
4. I get to choose how I play in *[exhibit name].*	-2 -1 1 2	personal interest
5. I like the things I get to play with here in *[exhibit name].*	-2 -1 1 2	personal interest
6. I had fun playing in *[exhibit name]* today.	-2 -1 1 2	motivation
7. I like to try new things here in *[exhibit name]*.	-2 -1 1 2	motivation

Response format: 4 circles will be placed on the floor as response a scale in shades of red. They will be arranged left to right with the lightest circle (on the left) having a large thumb down, the next a small thumb down, the next a small thumb up, and the darkest red circle (on the right) having a large thumb up image (see below answering format). Children will stand on the circle they most agree with.

8. I felt mad playing in *[exhibit name]* today.	-2 -1 1 2	emotion
9. I felt scared to play in *[exhibit name]* today.	-2 -1 1 2	emotion
10. I felt sleepy playing in *[exhibit name]* today.	-2 -1 1 2	emotion
11. I like playing here in *[exhibit name]*.	-2 -1 1 2	personal interest
12. I needed help to choose what to do in *[exhibit name].* (R)	-2 -1 1 2	motivation
13. I want to keep playing in *[exhibit name].*	-2 -1 1 2	motivation

Response format: children will point for each response (In the event that a child has limited physical mobility, this format may be used for all responses.)



14. It's okay to make a mess here at the children's museum.	-2 -1 1 2
15. There are many rules here at the children's museum.	-2 -1 1 2
16. What rules are there here at the children's museum?	
17. What do you think it means to be creative?	
18. It's easy to be creative here at the children's museum.	-2 -1 1 2
19. I was creative in *[exhibit name]* today.	-2 -1 1 2
20. What can help you be *more* creative in *[exhibit name]*?	

Additional notes: _____

_____

_____

Appendix L

Intervention Post-Observation Child Questionnaire Researcher's Script

I'm trying to learn what kids, like you, think about playing here at *[exhibit name],* where you *just* played. [points to/gestures towards the exhibit that the child just played in as observational part of study] …

Items 1-7: Response format #1: children will give two thumbs up, one thumb up, one thumb down, or two thumbs down.

…to help me do this, I'm going to say some different things. Each time I say something, I'd like if you could show me what you think about it by giving me thumbs up or thumbs down. Giving me thumbs up or down will show me whether you think each sentence I say sounds like you or doesn't sound like you.
If what I say is *very* true for you and you *really* feel like it's something you think sounds right, I'd like you to show me *two* thumbs up. Like this: [shows child two thumbs up]. Can you give two thumbs up with me?
[waits for child to give two thumbs up.] Great.
If it's a little true for you, I'd like you to show me one thumbs up. Like this: [shows child two thumbs up]. Can you give one thumb up with me?
[waits for child to give one thumb up.] Great.
If it's *not* true for, I'd like you to show me one thumb down. Like this: [shows child one thumb down]. Can you give two thumbs down with me?
[waits for child to give one thumb down.] Great.
And if it's *not* true *at all* for you, I'd like you to show me two thumbs down. Like this: [shows child two thumbs down]. Can you give one thumb down with me?
[waits for child to give two thumbs down.] Great! Now let's try one!

PRACTICE SET

I like the color blue. If you *really* like the color blue *a lot*, show me two thumbs up. If you like the color blue, show me one thumb up. If you don't like the color blue, show me one thumb down. And if you *really* don't like the color blue *at all*, show me two thumbs down.
[if responds immediately]: Okay.
[if does not respond]: I like the color blue.
[if responds]: Okay.
[if no response – move on to next item]

I like to eat bananas.
[if responds immediately]: Okay.
[if hesitates or does not respond]: I like to eat bananas.
[wait, if still no response, prompt with reminder]: If you *really* like to eat bananas *a lot*, show me two thumbs up. If you like to eat bananas, show me one thumb up. If you don't like to eat bananas, show me one thumb down. And if you *really* don't like to eat bananas *at all*, show me two thumbs down.
[if responds]: Okay.

[if no response – move on to next item]

TEST

Item 1: I felt happy playing in *[exhibit name]* today.
[if responds immediately]: Okay.
[if hesitates or does not respond]: I felt happy playing in *[exhibit name]* today.
[wait, if still no response, prompt with reminder]: If you felt *very* happy playing in *[exhibit name]* today, show me two thumbs up. If you felt happy playing in *[exhibit name]* today, show me one thumb up. If you didn't feel happy playing in *[exhibit name]* today, show me one thumb down. And if you didn't feel happy *at all* playing in *[exhibit name]* today, show me two thumbs down.
[if responds]: Okay.
[if no response – move on to next item]

Repeat for Items 2-7.

Items 8-13: Response format #2: 4 circles will be placed on the floor as response a scale in shades of red. They will be arranged left to right with the lightest circle (on the left) having a large thumbs down, the next a small thumbs down, the next a small thumbs up, and the darkest red circle (on the right) having a large thumbs up image (see below answering format). Children will stand on the circle they most agree with.

Very good. I'm going to read some more things just like the ones we just did, but this time I'd like you to tell me how much you think each sounds like you by standing on one of these 4 circles [points to circles on the ground]. This time, if what I say is *very* true for you, I'd like you to stand on this circle all the way over here with the big thumbs up [moves towards and points to circle with the big thumbs up]. Can you stand on this circle with the big thumbs up? [waits for child to stand on circle.] Great.
If it's just a little true for you, I'd like you to stand on this circle with the little thumbs up. [moves towards and points to circle with little thumbs up]. Can you stand on this circle with the little thumbs up? [waits for child to stand on circle.] Great.
If it's *not* true for you, I'd like you to stand on this circle with a little thumbs down [moves towards and points to circle with a little thumbs down]. Can you stand on this circle with the little thumbs down? [waits for child to stand on circle.] Great.
And it's *not* true for you *at all*, I'd like you to stand on this circle with the big thumbs down. [moves towards and points to circle with the big thumbs down]. Can you stand on this circle with the big thumbs down? [waits for child to stand on circle.]
Great! Now let's try one!

PRACTICE SET

I like cookies. If you *really* like cookies *a lot*, stand on the circle with the big thumbs up [points to circle with the big thumbs up]. If you like cookies, stand on the circle with the little thumbs up [points to circle with the small thumbs up]. If you don't like cookies, stand on the circle with the small thumbs down [points to circle with the small thumbs down]. And

if you *really* don't like cookies *at all*, stand on the circle with the big thumbs down [points to circle with the big thumbs down].
[if responds]: Okay.
[if hesitates or does not respond]: I like cookies.
[if responds]: Okay.
[if no response – move on to next item]

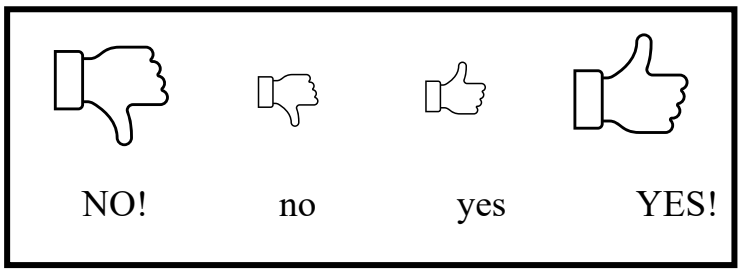
I like to play in the snow.
[if responds immediately]: Okay.
[if hesitates or does not respond]: I like to play in the snow.
[wait, if still no response, prompt with reminder]: If you *really* like to play in the snow *a lot*, stand on the circle with the big thumbs up [points to circle with the big thumbs up]. If you like to play in the snow, stand on the circle with the little thumbs up [points to circle with the little thumbs up]. If you don't like to play in the snow, stand on the circle with the little thumbs down [points to circle with the little thumbs down]. And if you *really* don't like to play in the snow *at all*, stand on the circle with the big thumbs down [points to circle with the big thumbs down].
[if responds]: Okay.
[if no response – move on to next item]

TEST

Item 8: I felt mad playing in *[exhibit name]* today.
[if responds immediately]: Okay.
[if hesitates or does not respond]: I like to play in the snow.
[wait, if still no response, prompt with reminder]: If you felt *very* mad playing in *[exhibit name]* today, stand on the circle with the big thumbs up [points to circle with the big thumbs up]. If you felt mad playing in *[exhibit name],* stand on the circle with the little thumbs up [points to circle with the little thumbs up]. If you didn't feel mad playing in *[exhibit name]*, stand on the circle with the little thumbs down [points to circle with the little thumbs down]. And if you didn't feel mad *at all* playing in *[exhibit name]*, stand on the circle with the big thumbs down [points to circle with the big thumbs down].
[if responds]: Okay.
[if no response – move on to next item]

Repeat for Items 9-13.

Items 14-22: Response format #3: some open-ended, some children will point for each response (In the event that a child has limited physical mobility, this format may be used for all responses.)



Very good. I'm going to read some more things just like the ones we just did, but this time I'd like you to tell me how much you think it's true for you by pointing to one of these four pictures.
This time, if what I say is *very* true for you, I'd like you to point to this big thumbs up that has a large YES! [points to big thumbs up] Can you point to the big thumbs up? [waits for child to correctly point] Great.
If what I say is a little true for you, I'd like you to point to this small thumbs up that has a small yes [points to small thumbs up] Can you point to the small thumbs up? [waits for child to correctly point] Great.
If what I say is *not* true for you, I'd like you to point to this small thumbs down that has a small no [points to small thumbs down] Can you point to the small thumbs up? [waits for child to correctly point] Great.
If what I say is *not* true for you, I'd like you to point to this big thumbs down that has a big NO! [points to big thumbs down] Can you point to the big thumbs up? [waits for child to correctly point]
Great! Now let's try one!

PRACTICE SET

I like the color yellow. If you *really* like the color yellow *a lot*, point to the big thumbs up. If you like the color yellow, point to the small thumbs up. If you don't like the color yellow, point to the small thumb down. And if you *really* don't like the color yellow *at all*, point to the big thumbs down.
[if responds immediately]: Okay.
[if does not respond]: I like the color yellow.
[if responds]: Okay.
[if no response – move on to next item]

I like to play in the rain.
[if responds immediately]: Okay.
[if hesitates or does not respond]: I like to play in the rain.
[wait, if still no response, prompt with reminder]: If you *really* like to play in the rain *a lot*, point to the big thumbs up. If you like to play in the rain, point to the small thumbs up. If you don't like to play in the rain, point to the small thumbs down. And if you *really* don't like to play in the rain *at all*, point to the big thumbs down.
[if responds]: Okay.
[if no response – move on to next item]

TEST

Item 14: It's okay to make a mess here at the children's museum.
[if responds immediately]: Okay.
[if hesitates or does not respond]: It's okay to make a mess here at the children's museum.
[wait, if still no response, prompt with reminder]: If you think that it's *really* okay to make a mess here at the children's museums, point to the big thumbs up. If it's okay to make a

mess here at the children's museum, point to the small thumbs up. If it's not okay to make a mess here at the children's museums, point to the small thumbs down. And if it's *really* not okay to make a mess here at the children's museum, point to the big thumbs down.
[if responds]: Okay.
[if no response – move on to next item]

Repeat format for Items 15, 18, and 19
[before Item 18] Let's answer by pointing again.

I also have a few questions that we won't point for. But you can tell me your answer. Let's do one of those now.
Item 16: What rules are there here at the children's museum?
[if responds with only a few words]: Are there any other rules at the children's museum?
[if responds]: Okay.
[if no response] What rules are there here at the children's museum?
[if responds or responds with more detail]: Okay.
[if no response – move on to next item]

Repeat format for Item 20

Item 19: What do you think it means to be creative?
[if responds with only a few words]: What else do you think it means to be creative?
[if responds]: Very good. Yes, you can be creative (use child's answer). Being creative means thinking of or imagining different things and ideas, and then using them when we are playing or making something. You can be creative in a lot of different ways! Some other ways of being creative are when we tell jokes, when we build with blocks, when we paint, when we use our imaginations to tell stories, when we think of ways to solve problems, when we dance, and when we pretend to be someone else, like a pirate. These are just some ways to be creative. There are lots of ways to be creative!
[if no response] What do you think it means to be creative?
[if responds or response with more detail]: Very good. Yes, you can be creative (use child's answer). Being creative means thinking of or imagining different things and ideas, and then using them when we are playing or making something. You can be creative in a lot of different ways! Some other ways of being creative are when we tell jokes, when we build with blocks, when we paint, when we use our imaginations to tell stories, when we think of ways to solve problems, when we dance, and when we pretend to be someone else, like a pirate. These are just some ways to be creative. There are lots of ways to be creative!
[if no response]: Being creative means thinking of or imagining different things and ideas, and then using them when we are playing or making something. You can be creative in a lot of different ways! Some ways of being creative are when we tell jokes, when we build with blocks, when we paint, when we use our imaginations to tell stories, when we think of ways to solve problems, when we dance, and when we pretend to be someone else, like a pirate. These are just some ways to be creative. There are lots of ways to be creative!

Closing

We're all done! Thank you so much for telling me all about how it was to play here in *[exhibit name]*! I hope you have fun during the rest of your visit at the children's museum today!

[if at any point during the test, the child asks a question or makes an unrelated comment]: That's interesting. Why don't we wait to talk about that at the end? [repeat prior statement]

Appendix M

Creativity-Related Information, Motivation, and Behavioural Skills Survey Items

Table M1

Information, Motivation, and Behavioural Skills Survey Item Categorisation, Score Transformation, and Mean

Creativity-related understanding statement	Creativity-related IMB understanding category	Item score transformation	Mean
It's important to me that I give my child a variety of different experiences.	Motivation		1.09
Creativity might happen in other subjects or during other activities, but art is the most creative.	Information	Reverse coded	0.39
Creativity supports learning.	Motivation		1.22
Creativity doesn't take much time—it happens in a lightbulb or 'aha!' moment.	Information	Reverse coded	-0.24
I find it difficult to be open to my child's impractical or wild ideas.	Behavioural skills	Reverse coded	0.65
It's important to encourage creative thoughts and activities.	Motivation		1.19
I have trouble prompting my child to notice similarities or connections between different ideas or situations.	Behavioural skills	Reverse coded	0.60
With the right conditions, everyone can be creative.	Information		1.06
I want my child to have opportunities to use their creativity every single day.	Motivation		1.13
Truly creative people must be born that way.	Information	Reverse coded	0.81

Being creative plays a role in determining greater future success in a person's working life.	Motivation		0.54
Daydreaming is a waste of time.	Motivation	Reverse coded	0.86
Creative activities are okay as hobbies, but more time should be spent on learning factual knowledge.	Motivation	Reverse coded	0.72
I don't always know how to best support my child in expressing their individuality.	Behavioural skills	Reverse coded	0.20
If someone is really creative in one area of their life, they will be more creative in all areas.	Information	Reverse coded	0.18
I am confident in my abilities to support my child's creativity.	Behavioural skills		0.59
I am able to be flexible and follow my child's lead when we are playing together.	Behavioural skills		0.72
I know questions I can ask my child to help them think from different perspectives or of different possibilities.	Behavioural skills		0.46
The more experience someone has with an activity or subject, the more creative they can be in it.	Information	Reverse coded	0.12
There are many different ways of being creative.	Information		1.29
It's easy for me to stand back and allow my child to take sensible risks on their own.	Behavioural skills		0.69
Creativity only benefits the person who is being creative.	Motivation	Reverse coded	0.92
Someone's mood affects how creative they can be in that moment.	Information		0.64
To be creative, effort is more important than natural talent.	Information		0.14
Being creative supports a person's overall well-being.	Motivation		0.85

The higher someone's IQ is, the more creative they are.	Information	Reverse coded	0.55
I am a creative person.	Behavioural skills		0.49
I feel confident expressing my own creativity.	Behavioural skills		0.49
I have strategies for helping my child manage their frustration and try again when their solution doesn't work.	Behavioural skills		0.54
Anyone can learn strategies to become more creative.	Information		0.76

Appendix N

Caregiver Elicitation Research Survey

Start of Block: Block 12

Thank you for your interest in participating in A Spotlight on Creativity.

Participant Information and Consent:

This study aims to understand how caregivers of 5–8-year-old children think about children's museums and creativity. If you have any questions or you'd like to participate in the study but have trouble with the online survey in any way, please don't hesitate to reach out: kathleen.kupiec@education.ox.ac.uk Inquires will be confidential.

This study has received ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee. (Ethics reference: EDUC_C1A_23_346).

The survey will take approximately 15-20 minutes to complete. You can withdraw yourself from the study at any time during the survey by closing the window. If you decide to withdraw by doing this, any responses that have been collected from you will not be recorded. Once you complete the survey, your responses will be recorded and you will not be able to withdraw your data.

All data is collected anonymously and your IP address will not be recorded, such that you will not be identifiable from the data or the research outputs. The findings from the research may be written up in a thesis, academic publications, and conference presentations. As a student at the University of Oxford, all data will be safely stored, managed, protected, and destroyed in alignment with the University of Oxford's policies. Further information about your rights with respect to your personal data is available at https://compliance.admin.ox.ac.uk/individual-rights. Although every reasonable effort has been taken, confidentiality during actual internet communication procedures cannot be guaranteed. Data may be stored on backups or server logs beyond the timeframe of this research project.

This study is being undertaken by a student researcher under supervision. If you have a concern about any aspect of this study, please contact the student researcher Kathleen Kupiec (kathleen.kupiec@education.ox.ac.uk) or her supervisors: Sonali Nag (sonali.nag@education.ox.ac.uk) and Sandra Mathers (Sandra.mathers@education.ox.ac.uk). We will do our best to answer your query. We will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:

The Chair, Education Research Ethics Committee
Email: student.curec@education.ox.ac.uk
Address: Department of Education, University of Oxford
15 Norham Gardens
Oxford OX2 6PY
United Kingdom

The Chair, Social Sciences & Humanities Interdivisional Research Ethics Committee
Email: ethics@socsci.ox.ac.uk
Address: Research Services, University of Oxford
Boundary Brook House
Churchill Drive
Oxford OX3 7GB
United Kingdom

Participant Consent

	Yes	No
I confirm that I am at least 18 years old.	○	○
I confirm that I am the parent, guardian, or regular caregiver of at least one child aged 5-8 years.	○	○
I understand that my participation is voluntary and that I am free to stop the survey at any time by closing the window.	○	○
I understand that I will not be identifiable in any research outputs.	○	○
I agree to take part.	○	○

Skip To: End of Survey If Participant Consent = No

End of Block: Block 12

Start of Block: Default Question Block

When a question states 'your child', please think about the child(ren) who are aged 5 to 8 years that you are the parent, guardian, or regular caregiver of.

Please list all the museums that you and your child(ren) aged 5 to 8 years have visited together in the past year, to the best of your memory. This can include places such as children's museums, art museums, natural history museums, science centers, historic homes, zoos, aquariums, and botanical gardens. If you and your child(ren) have not visited any museums together in the past year, please write *none*.

_____

_____

_____

_____

_____

How many times have you and your child(ren) aged 5 to 8 years visited a **children's museum** together in the past year? If you and your child(ren) have not visited a children's museum together in the past year, please enter 0.

_____

End of Block: Default Question Block

Start of Block: Block 1

Please rank the following aspects of a children's museum visit, with 1 being the **most important** reason for a children's museum visit. *To rank the listed items, click on the item bars to drag and drop them into order.*

_____ community
_____ creativity
_____ curiosity
_____ discovery
_____ exploration
_____ family-oriented
_____ inspiration
_____ learning
_____ play

End of Block: Block 1

Start of Block: Block 11



What do you think are the 3 **most important** things about a children's museum visit? Please select 3.

- [ ] Having fun
- [ ] Doing something new or that couldn't be done elsewhere
- [ ] Interacting with museum staff
- [ ] Having a positive atmosphere, such as feeling welcoming, inclusive, or non-judgmental
- [ ] Being a comfortable space, such as being safe, easy to navigate, or not too crowded or noisy
- [ ] Having a variety of exhibits and materials to choose from
- [ ] Playing with other visitors
- [ ] Talking together as a group/family
- [ ] Being hands-on/interactive

End of Block: Block 11

Start of Block: Block 2



What do you think are the 3 **most important** roles for an **adult** during a children's museum visit? Please select 3.

- [ ] To supervise their child, such as their child's behavior or for their child's safety
- [ ] To encourage or prompt their child's engagement
- [ ] To serve as a teacher for their child, such as explaining concepts, modeling how to use materials, reading signs, or helping complete difficult tasks
- [ ] To direct or guide their child in order to move the visit along
- [ ] To have a moment to themselves, such as to rest, explore by themself, or check their phone
- [ ] To join in their child's play as a playmate, following their child's lead
- [ ] To learn new knowledge alongside their child
- [ ] To watch their child as a way to learn about their child, such as their child's interests or the ways their child learns
- [ ] To step back, allowing their child the freedom to do their own thing without any interference

End of Block: Block 2

Start of Block: Block 3

Please select the response that most represents how you feel about each statement listed below.

	strongly disagree	disagree	agree	strongly agree
I am familiar with what a children's museum is.	○	○	○	○
Children's museums are a good environment for children to be creative.	○	○	○	○
It would be my job to support my child's creativity during a children's museum visit.	○	○	○	○
I would feel at ease playing with my child at a children's museum.	○	○	○	○
There are many different ways for children to be creative at a children's museum.	○	○	○	○
It's important to visit all of the exhibits at a children's museum during each visit.	○	○	○	○
There is a right way to play at children's museums.	○	○	○	○
Children are most creative without any adult involvement.	○	○	○	○
There are plenty of opportunities for adults to support children's creativity at the children's museum.	○	○	○	○
It's hard for adults to be creative at children's museums.	○	○	○	○

End of Block: Block 3

Start of Block: Block 4

We are really interested in creativity. In this study, we are hoping to learn more about **child creativity**. Could you help us better understand how adults think about it by telling us what **child creativity** means to you? There is no right answer.

_____

_____

_____

_____

_____

End of Block: Block 4

Start of Block: Block 5



Please select the response that most represents how you feel about each statement listed below.

	strongly disagree	disagree	agree	strongly agree
It's important to me that I give my child a variety of different experiences.	○	○	○	○
Creativity might happen in other subjects or during other activities, but art is the most creative.	○	○	○	○
Creativity supports learning.	○	○	○	○
Creativity doesn't take much time—it happens in a lightbulb or 'aha!' moment.	○	○	○	○
I find it difficult to be open to my child's impractical or wild ideas.	○	○	○	○
It's important to encourage creative thoughts and activities.	○	○	○	○
I have trouble prompting my child to notice similarities or connections between different ideas or situations.	○	○	○	○
With the right conditions, everyone can be creative.	○	○	○	○
I want my child to have opportunities to use their creativity every single day.	○	○	○	○
Truly creative people must be born that way.	○	○	○	○

End of Block: Block 5

Start of Block: Block 6

Please select the response that most represents how you feel about each statement listed below.

	strongly disagree	disagree	agree	strongly agree
Being creative plays a role in determining greater future success in a person's working life.	○	○	○	○
Daydreaming is a waste of time.	○	○	○	○
Creative activities are okay as hobbies, but more time should be spent on learning factual knowledge.	○	○	○	○
I don't always know how to best support my child in expressing their individuality.	○	○	○	○
If someone is really creative in one area of their life, they will be more creative in all areas.	○	○	○	○
I am confident in my abilities to support my child's creativity.	○	○	○	○
I am able to be flexible and follow my child's lead when we are playing together.	○	○	○	○
I know questions I can ask my child to help them think from different perspectives or of different possibilities.	○	○	○	○
The more experience someone has with an activity or subject, the more creative they can be in it.	○	○	○	○
There are many different ways of being creative.	○	○	○	○

End of Block: Block 6

Start of Block: Block 7

X→

Please select the response that most represents how you feel about each statement listed below.

	strongly disagree	disagree	agree	strongly agree
It's easy for me to stand back and allow my child to take sensible risks on their own.	○	○	○	○
Creativity only benefits the person who is being creative.	○	○	○	○
Someone's mood affects how creative they can be in that moment.	○	○	○	○
To be creative, effort is more important than natural talent.	○	○	○	○
Being creative supports a person's overall well-being.	○	○	○	○
The higher someone's IQ is, the more creative they are.	○	○	○	○
I am a creative person.	○	○	○	○
I feel confident expressing my own creativity.	○	○	○	○
I have strategies for helping my child manage their frustration and try again when their solution doesn't work.	○	○	○	○
Anyone can learn strategies to become more creative.	○	○	○	○

End of Block: Block 7

Start of Block: Block 8

Please select the response that most represents how you feel about the statement listed below.

	strongly disagree	disagree	agree	strongly agree
I would like to learn more about child creativity.	○	○	○	○

Please rank the following things you can learn about child creativity, with 1 being what you would **most** like to learn more about. *To rank the listed items, click on the item bars to drag and drop them into order.*

_____ What child creativity is
_____ Strategies I can use to best support my child in being creative
_____ When I can most appropriately support my child's creativity
_____ Why child creativity matters
_____ The conditions that impact child creativity

Please rank the following ways you could learn about child creativity, with 1 being how you would **most** like to learn more about child creativity. *To rank the listed items, click on the item bars to drag and drop them into order.*

_____ Receiving a text
_____ Talking with someone who has expert knowledge
_____ Reading a sign/poster
_____ Reading a handout/pamphlet
_____ Watching others successfully support child creativity
_____ Watching a video

End of Block: Block 8

Start of Block: Block 9

What is the name of the school(s) that your child(ren) aged 5 to 8 years attends?

_____

Your gender:

_____

What is your relationship to your child(ren) (e.g., father, grandmother, uncle)?

_____

Your age:

- ○ under 30
- ○ 31-35
- ○ 36-40
- ○ 41-45
- ○ 46-50
- ○ 51-55
- ○ 56-60
- ○ 61-65
- ○ 66-70
- ○ 71+

End of Block: Block 9

Start of Block: Block 10

Your zip code:

_____

Which of the following categories best represents your highest level of completed education?

- ○ No high school diploma
- ○ High school diploma
- ○ Associate's degree
- ○ Bachelor's degree
- ○ Master's degree
- ○ Ph.D. or professional degree (e.g., M.D. or J.D.)
- ○ Prefer not to say

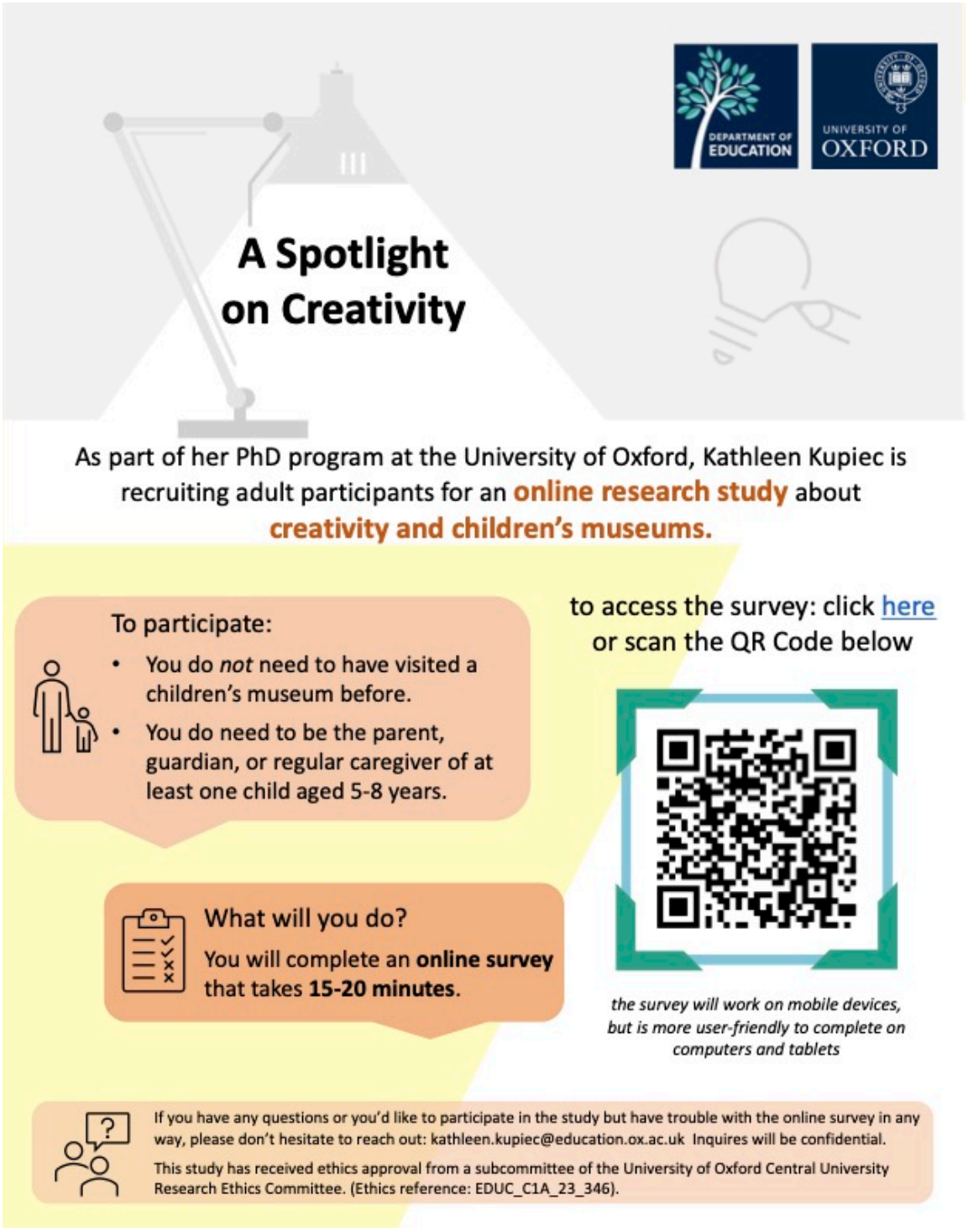
Which racial or ethnic group(s) do you identify with? Please select all that apply.

- ☐ American Indian or Alaskan Native
- ☐ Asian
- ☐ Black or African American
- ☐ Hispanic or Latinx
- ☐ Native Hawaiian or Pacific Islander
- ☐ White or Caucasian
- ☐ Not listed here: _____
- ☐ Prefer not to say

End of Block: Block 10

Appendix O

Elicitation Research Recruitment Flyer



Appendix P

Coding Framework: Study 3

1. **Conditional**
    - 1.1. Permission to, allowing
        - 1.1.1. Freedom
            - 1.1.1.1. No right or wrong, risk-free
            - 1.1.1.2. Mess
        - 1.1.2. Opportunity
    - 1.2. Child-centred
        - 1.2.1. Child-only
        - 1.2.2. Child-led, -directed, or -decided
        - 1.2.3. Active participation
    - 1.3. Adult interaction
        - 1.3.1. Little or no adult input, guidance, or rules
            - 1.3.1.1. Adult can be constraint
        - 1.3.2. Balancing support with stepping back
            - 1.3.2.1. Observing child to learn
        - 1.3.3. Encouragement and guidance
        - 1.3.4. Adult modelling
    - 1.4. Environment
        - 1.4.1. Materials and tools
        - 1.4.2. Safe
        - 1.4.3. Space and place
        - 1.4.4. Balance and variety
        - 1.4.5. Developmentally appropriate
        - 1.4.6. Hindered by technology
    - 1.5. Open-ended

2. **Engagement or "how"**
    - 2.1. Play
    - 2.2. Manipulate materials, hands-on
    - 2.3. Related terms
        - 2.1.1 Exploration
        - 2.1.2 Using imagination
        - 2.1.3 Discover
        - 2.1.4 Experimentation
    - 2.4. Process
    - 2.5. Engage
    - 2.6. Interact
    - 2.7. Spontaneity
    - 2.8. Multi-sensory
    - 2.9. Takes time
    - 2.10. Unfiltered

3. **Generativity, external expression (e.g., create, make)**
    3.1. New or different
        3.1.1. New to them
        3.1.2. Not always meaningful to adults
    3.2. Imagination
    3.3. Creative
    3.4. Fun
    3.5. Outside the box
    3.6. Unexpected

4. **Mediate towards another benefit**
    4.1. To learn, understand, or discover
    4.2. To have fun
    4.3. Outlet for self-expression
    4.4. Self-discovery (e.g., interests, enjoyments)
    4.5. Build their confidence
    4.6. Form own ideas
    4.7. Further build creativity
    4.8. Experience their surroundings
    4.9. Find new ways to engage with others

5. **Cognitive**
    5.1. Ideas
    5.2. Thinking
    5.3. Ability
    5.4. Capacity

6. **Multiple ways of being creative and expressing creativity**
    6.1. Types of play
        6.1.1. Pretend play
        6.1.2. Physical play
        6.1.3. Imaginary play
    6.2. Art
    6.3. Problem solving
    6.4. Story
    6.5. Self-care
    6.6. With natural elements
    6.7. With what they found

7. **Individualised, unique, or personally experienced**
    7.1. Related to interests
    7.2. Unique perception or approach
    7.3. Dependent on emotions
    7.4. Dependent on personality
    7.5. Some inherently creative, others not

8. **Integration**

9. **Supported by new experiences**
    9.1. Variety of experiences

10. **A form of self-actualisation**

11. **Versus adult creativity**
    11.1. Adult trying to see as if child, open mind
    11.2. Children's perspective
    11.3. Creativity performed by child
    11.4. Different from adult
    11.5. Immature imagination

12. **Connection**

13. **Caregiver enjoy seeing children's creativity**

14. **Sensory**

15. **With other children**

16. **Inspiration**

17. **Unlimited**

Appendix Q

Ethics Approval and Amendment Approval Letters

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION
15 Norham Gardens, Oxford OX2 6PY
student.curec@education.ox.ac.uk; staff.curec@education.ox.ac.uk
DREC Chair: Professor Liam Gearon

CONFIDENTIAL

Kathleen Kupiec

November 9, 2022

Dear Kathleen,

Research Ethics Approval – CUREC 1a

Ethics Approval Reference: CIA-2223-010

Study Title: Curating for creativity: Exploring practices of American children's museums

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for Ethical Approval of all research involving human participants.

I am pleased to inform you that, on the basis of the information provided to the DREC, the proposed research has been judged as meeting appropriate ethical standards, and accordingly, approval has been granted.

Please continue to follow *COVID-19: CUREC guidance on research involving human participants* https://researchsupport.admin.ox.ac.uk/governance/ethics/coronavirus

If relevant, please also check the CUREC website for their **best practice guidance**: https://researchsupport.admin.ox.ac.uk/governance/ethics/resources/bpg

Amendments

Should there be any subsequent changes to the study, you should submit details to the DREC for consideration and approval. Details of changes must be listed on an amendment form.

Please do not hesitate to contact me if you have any queries.

Good luck with your research study.

Yours sincerely,

Dr Pinar Kolancali
Post-doctoral Researcher
Departmental Research Ethics Committee Member
Email: pinar.kolancali@education.ox.ac.uk

Delete | Archive | Report | Move to | Reply | Reply all | Forward | Share to Teams | Zoom | Read /

Re: Amendment form for application CIA-2223-010

From: Pinar Kolancali <pinar.kolancali@education.ox.ac.uk>
Sent: 12 April 2023 16:58
To: Kate Kupiec <kathleen.kupiec@education.ox.ac.uk>; Sandra Mathers <sandra.mathers@education.ox.ac.uk>
Cc: Student CUREC <student.curec@education.ox.ac.uk>
Subject: Re: Amendment form for application CIA-2223-010

Dear Kate,

I hereby approve your amendment application. Best of luck with your research.

Best wishes,
Pinar

Dr Pinar Kolancali
Postdoctoral Researcher
Departmental Research Ethics Committee Member
15 Norham Gardens, Oxford OX2 6PY
Email: pinar.kolancali@education.ox.ac.uk
LiFT: http://www.education.ox.ac.uk/research/lift-learning-for-families-through-technology/



Kolancali, P., & Melhuish, E. (2021). Effects of Migration on the Language and Literacy Practices of Turkish Parents in England. Journal of Family Issues. https://doi.org/10.1177/0192513X21104198

SOCIAL SCIENCES & HUMANITIES
INTERDIVISIONAL RESEARCH ETHICS COMMITTEE
DEPARTMENTAL RESEARCH ETHICS COMMITTEE

Department of Education
15 Norham Gardens, Oxford OX2 6PY
student.curec@education.ox.ac.uk; staff.curec@education.ox.ac.uk



Kathleen Kupiec
Department of Education, Social Sciences Division
University of Oxford

20 December 2023

Dear Kathleen,

Research ethics approval

Research title: Mindfully creative: A caregiver-directed intervention to support child creativity during family visits to the American children's museum.

Research ethics reference: EDUC_C1A_23_346

The above application has been considered on behalf of the Education Departmental Research Ethics Committee (DREC) in accordance with the University's procedures for ethical approval of all research involving human participants.

I am pleased to confirm that, on the basis of the information provided to the DREC, ethics approval has now been granted for this study.

Please note the following:

Personal data: It is the responsibility of the PI to ensure that all personal data collected during the project is managed in accordance with the University's guidance and legal requirements.

In-person activities: Any data collection involving in-person interactions with participants must have an up-to-date fieldwork risk assessment in place; further guidance is available from the Safety Office's website.

Amendments: Please notify the committee if you intend to make any amendments to the information in your ethics application as submitted at date of this approval, as all changes must receive ethical approval prior to implementation. The amendment form is available on the SSH IDREC webpage.

We welcome feedback on your experience of the ethical review process and suggestions for improvement. Please email any comments to staff.curec@education.ox.ac.uk / student.curec@education.ox.ac.uk or ethics@socsci.ox.ac.uk.

Yours sincerely

Lulu Shi

DREC member

cc: Sandra Mathers, sandra.mathers@education.ox.ac.uk; Sonali Nag, sonali.nag@education.ox.ac.uk; student.curec@education.ox.ac.uk

SOCIAL SCIENCES & HUMANITIES
INTERDIVISIONAL RESEARCH ETHICS COMMITTEE
DEPARTMENTAL RESEARCH ETHICS COMMITTEE

Department of Education
15 Norham Gardens, Oxford OX2 6PY
student.curec@education.ox.ac.uk; staff.curec@education.ox.ac.uk



Kathleen Kupiec
Department of Education, Social Sciences Division
University of Oxford

9 March 2024

Dear Kathleen,

Research ethics approval

Research title: A spotlight on creativity: What caregivers think about child creativity and supporting it at American children's museums

Research ethics reference: EDUC_C1A_23_346

Date of amendment: 7 March 2024

Amendment number: 1

The above amendment has been considered on behalf of the Department of Education Departmental Research Ethics Committee (DREC) in accordance with the University's procedures for ethical approval of all research involving human participants.

I am pleased to confirm that, on the basis of the information provided to the DREC, ethics approval has now been granted for this amendment.

Please note the following:

Personal data: It is the responsibility of the PI to ensure that all personal data collected during the project is managed in accordance with the University's guidance and legal requirements.

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We welcome feedback on your experience of the ethical review process and suggestions for improvement. Please email any comments to student.curec@education.ox.ac.uk or ethics@socsci.ox.ac.uk.

Yours sincerely

Lulu Shi



DREC member

cc: Sandra Mathers, sandra.mathers@education.ox.ac.uk; Sonali Nag, sonali.nag@education.ox.ac.uk; student.curec@education.ox.ac.uk

SOCIAL SCIENCES & HUMANITIES
INTERDIVISIONAL RESEARCH ETHICS COMMITTEE
DEPARTMENTAL RESEARCH ETHICS COMMITTEE

Department of Education
15 Norham Gardens, Oxford OX2 6PY
student.curec@education.ox.ac.uk; staff.curec@education.ox.ac.uk



Kathleen Kupiec
Department of Education, Social Sciences Division
University of Oxford

14 June 2024

Dear Kathleen,

Research ethics approval

Research title: A spotlight on creativity: What caregivers think about child creativity and supporting it at American children's museums

Research ethics reference: EDUC_C1A_23_346

Date of amendment: 28 May 2024

Amendment number: 1

The above amendment has been considered on behalf of the Department of Education Departmental Research Ethics Committee (DREC) in accordance with the University's procedures for ethical approval of all research involving human participants.

I am pleased to confirm that, on the basis of the information provided to the DREC, ethics approval has now been granted for this amendment.

Please note the following:

Personal data: It is the responsibility of the PI to ensure that all personal data collected during the project is managed in accordance with the University's guidance and legal requirements.

In-person activities: Any data collection involving in-person interactions with participants must have an up-to-date fieldwork risk assessment in place; further guidance is available from the Safety Office's website.

Amendments: Please notify the committee if you intend to make any further amendments to the information in your ethics application as submitted at date of this approval, as all changes must receive ethical approval prior to implementation. The amendment form is available on the SSH IDREC webpage.

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Yours sincerely

Lulu P. Shi



DREC member

cc: Sandra Mathers, sandra.mathers@education.ox.ac.uk; Sonali Nag, sonali.nag@education.ox.ac.uk; student.curec@education.ox.ac.uk

Appendix R

Developing an Observational Tool to Support Measuring Creativity During Children's Museum Family Visits

The Purpose of Documenting Child Creativity

> In his field-sparking address, Guilford (1950) stated:
>
> Once the factors have been established as describing the domain of creativity, we have a basis for the means of selecting the individuals with creative potentialities. We should also know enough about the properties of the primary abilities to do something in the way of education to improve them and to increase their utilization. (p. 454)

However, a wealth of evidence shows that few widely used creativity assessments, approaches, or measured variables (e.g., divergent thinking) are significantly correlated with creative achievement or real-world creativity (e.g., Amabile, 1996; Hocevar & Bachelor, 1987; Jaschek et al., 2023; Jung & Hunter, 2023). While this is unsurprising given that these are, typically, narrowly targeted (e.g., divergent thinking) and decontextualised assessments of an experience-based Lifelong Competency, some researchers have begun to consider the lack of assessments' predictive validity of real-world creativity and creative achievement a contemporary challenge for the field (e.g., Jung & Hunter, 2023; Plucker, 2023; Weisberg, 2023). This goal is misguided, as it creates artificial separations for a competency that is *for everyone* and *growth-oriented*, not just a skill for a selectively identifiable subset of eminent creatives to hone and utilise. When viewed as a developmental, experience-dependent, and opportunity-linked competency (see section 'Creativity is Growth-Oriented' in Chapter Six), in which every child has creative potential, it becomes more important to be able to identify children's creativity in order to understand creativity-enhancing variables, circumstances, and opportunities as a way to inform the design of environments and experiences that will support and nurture creative expression and growth for all, rather than a narrowly identified few, such that everyone can benefit from the work.

Necessitates Observation

Observation is extremely underutilised and underappreciated in the field of creativity (e.g., Katz-Buonincontro & Anderson, 2020; Snyder et al., 2019). Moreover, a review of 184 studies investigating creativity in 6- to 12-year-olds found that only 20% incorporated methods to examine creativity at a micro-level, or to measure engagement

within the task and between the child and their environment (Kupers et al., 2018). This could be due, in part, to the lack of creativity conceptualisations and definitions that would not only inform but also necessitate such an observational approach, particularly one that is able to capture experiential engagement as it unfolds and creative generativity as it emerges. Thus, the conceptualisation of creativity represented by the CLOVER and the proposal of the sub-construct of child creativity, defined as the integration of something that is not already in the present moment and context into the present moment and context (see Chapter Six), have significant methodological implications for recognising and measuring children's creativity.

Creativity is most appropriately conceptualised as an experience and, as shown by the CLOVER (see Figure 6.1), emerges at the interactive and interdependent overlap of individual (i.e., thinking and feeling) and environmental components functioning through continuous and mutual (re)definition (see section 'Componential Intersection: A Dynamic Systems Model' in Chapter Six). According to Bandura (1978b), "the methodology for elucidating psychological processes requires analysis of sequential interactions between the triadic, interdependent factors within the interlocking system" (p. 346). Thus, and accounting for change over time, measures of creativity need to not only identify the presence or absence of influencing variables but also their spatial and temporal contingency, or the way in which individuals' (inter)actions unfold with(in) their social and physical environments during engagement. In other words, creativity measures must go beyond identifying *what* variables are present to also include their involvement and progression, allowing *how* each shapes creativity to be examined. Moreover, the term "integration" in the definition of child creativity indicates that time is a fundamental consideration for children's creativity, and that this integration must be into the child's present moment and context underscores the importance of context (see section 'Proposing and Defining a Sub-Construct: "Child Creativity"' in Chapter Six). Therefore, measuring child creativity in the children's museum requires a methodological approach that is sensitive to both time and context. Observations allow researchers to attend to "rich contextual information"—social and physical—and to examine processes as they unfold (Cohen et al., 2017).

Creative engagement occurs through (inter)action with(in) an individual's environment, and creative generativity can take on many diverse forms of communicative

manifestation. As such, capturing both social and material (inter)actions, including verbal and non-verbal engagements and expressions, observational approaches are essential for fully understanding creativity. This has important implications for creativity during family visits to children's museums, as it means that observations can capture hands-on and hands-off *and* mind-on and mind-off caregiver behaviours. Additionally, creativity and museum visits are each temporally contingent and influenced by both fluctuating situational and sustained variables. By identifying and documenting *what* variables are contributing to an individual's environment and *how* they unfold during engagement, observations are also able to inform the influence of others in two important ways: (1) as variables of the social environment and (2) as engaged partners, such as during group creativity (see section 'Group Creativity' in Chapter Six). Further, observations can explore reciprocity, such as whether more creative children elicit more creativity-enhancing caregiver behaviours and/or vice-versa. Since children's creativity can manifest to various degrees and does not require that integration is successful, observations of how children's creative engagements unfold could be helpful in examining social and physical environmental variables that both support *and* hinder creativity, as well as the strength each influence has. These insights could inform where it may be optimal to focus museum resources and design efforts, as well as when it may be most important to encourage caregiver support, in an effort to maximise children's creativity.

The Importance of Observing During Play-Based Situations

While standardised and lab-based tasks have contributed important insights to the field, Amabile (2017) argues the following:

> In order to fully understand creativity and what influences it, and in order to confidently prescribe ways in which individuals, organizations, and societies can enhance it, we must undertake studies of creative behavior—and the accompanying psychological states and environmental contexts—*in situ*, as it is happening. (p. 336)

This could be more important for children, as opposed to adults, because of the pronounced influence that circumstantial and situational factors are likely to have on their creativity (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components' in Chapter Six).

Much of the literature on children's play focuses on learning through play, including creativity. In fact, Zosh et al. (2017) have suggested "that guided play is likely to be a

springboard for creativity" (p. 172). However, children also engage in creative processes during play (Smolucha, 1992; Vygotsky, 1967/2004), such that play is a powerful window into *and out of* children's thinking. In other words, creativity is not only developed but also *expressed* through play. This is particularly important because identifying and measuring child creativity not only necessitates observational methods, but observations conducted during play-based situations are expected to be the most informative and effective. This is because children enjoy playing, and affective-conative states may have an especially heightened influence in children (see section 'Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components' in Chapter Six). Without positive affective-conative states, such as those linked to children's play, the catalyst of the "feeling" component in the CLOVER could remain dormant (see section 'Componential Intersection: A Dynamic Systems Model' in Chapter Six). As a result, standardised tasks and artificial efforts to induce creativity may be too disengaging for some children, potentially sacrificing the possibility of generative integration. Consequently, non-play-based contexts or standardised tasks may lead to inaccurate or unusable information that observations during play-based engagement could otherwise capture.

It is crucial to draw the distinction that play-based situations do not mean playful situations. In fact, creativity testing phases that employ observation during a standardised task, even when made to be child-friendly and playful (e.g., Ball and Jar Task: Evans et al., 2021; the Affect in Play Scale: Russ, 1998), often constrict children to particular tasks, domains, and forms of expression. This may limit the recognition and appreciation of some children's creativity. Moreover, even if playful, as a result of the constraints of a specified task, such approaches may elicit less intrinsic motivation, interest, and positive affect in some children than others. Additionally, because these measures are standardised, they prioritise the *task* context rather than beginning with the *child's* context, as necessitated by the definition of child creativity. In doing so, they become tests more concerned with identifying *who* is creative rather than what might be creativity-enhancing. Instead, play-*based* situations begin with the child's context while permitting a greater degree of open-ended engagement, in which children can follow their own interests and a wider range of child-directed expressions can be captured. Furthermore, playful tasks revolving around standardisation minimise the dynamic impacts of environmental variables, whereas play-based observations can capture the unique impacts of various environmental variables,

offering insights to not only better understand but also enhance children's creativity. As children's museum visits and museum learning are based in play (e.g., Luke et al., 2021; Luke & Windleharth, 2013; see Chapter Three; see Chapter Seven), exhibit engagement during family visits to children's museums is an appropriate experience during which to observe child creativity and explore the influences of environmental variables, both social and physical.

Proposing an Observational Tool

Drawing on the findings of this work, literature review, and existing observational tools, an observational tool scoring template (see Appendix I) and accompanying detailed coding manual (see Appendix J) were developed in preliminary form, with the intention of supporting future evaluation and research through the measurement and documentation of caregiver creativity-related behaviours, child engagement and creativity, and how these unfold over the length of children's museum exhibit play during family visits.

The tool begins with a few key contextualising items, which were informed by literature suggesting that some factors likely to influence visitors' (inter)actions with(in) museums, including their creative engagement, are less predictable at the children's museum, such that they must be reported individually for each visitor (see section '(Un)predictability' in Chapter Three). The first item is used to indicate the level of exhibit crowdedness. This is informed by the influence that crowding and noise have on the museum experience, including on family interactions (see Chapter Three), and that "practically everything that increases the level of arousal generates lower achievement or failure in creativity tests" (Urban, 2003, p. 91) (e.g., noise: Mehta et al., 2012). In fact, evidence suggests that crowded spaces and interruptions disrupt workplace creativity (Amabile, 2003). The second item is used to capture the (dis)organisation of materials. This is informed by findings that the level of completion that problem-solving museum exhibits are in when visitors arrive at an exhibit can impact their engagement (Henderlong & Paris, 1996), museum professionals believe that messy activities are unique, engaging, and creativity-enhancing during children's museum visits (see Chapter Seven), and the presentation of task materials and environmental organisation can influence creativity (e.g., Isen et al., 1987; Vohs et al., 2013). As findings suggest that children engage with exhibits differently depending on their age, including in their creative engagement (see Chapter Seven), and observational learning occurs during museum visits (see Chapter Three; see

Chapter Seven), the age of other child visitors in the exhibit during engagement has been included. Finally, and particularly in light of reports about technology breaking down in museum exhibits (see Chapter Seven), there is a place to identify whether any exhibit features were unavailable for play, as this could impact children's opportunities for engagement and, consequently, their creative generativity, or integration.

Next, a set of items is used to record caregiver behaviours during the observation period. This has been designed to not only include behaviours that are likely to support creativity but also those that are likely to hinder it, which are indicated as reverse coded. In addition, and building from the matrix of caregiver roles that was generated through the analysis of walking interviews with museum professionals (see Figure 7.1), there is a place to select the type of caregivers' involvement and attention, as well as their approach to interacting with their child. These items could be particularly important for future work exploring differences in caregiver-supported children's creativity and caregiver-child group creativity. Finally, as cell phones were discussed across interviews with museum professionals as a significant form of caregivers' mindless disengagement (see Chapter Seven), a place to document caregivers' personal technology use is included. This section is followed by a set of items developed to measure child creativity in two ways: a first set of items measures creativity-influencing engagement processes (e.g., comfort, purpose, fluidity, collaboration, commitment), while another set of items have been designed to determine the degree of creativity (e.g., agency, conventionality, extension, complexity). High collaboration could also be utilised to indicate group creativity, but only if collaboration is together and simultaneous rather than inspired by.

These observational tool items and their descriptions were developed through and informed by a synthesis of the present work, including interview findings of what children's museum professionals notice about caregivers' behaviours and children's creativity during children's museum family visits (see Chapter Seven), along with literature review and the conceptualisations of children's museum visits and creativity proposed in this work (see Chapter Three; see Chapter Six). The development of the observational tool and the detailed coding manual were supported by existing play, creativity, and museum literature; observational tools and coding manuals; and empirical findings (Amabile, 1989; Amabile et al., 1996; Al-Abdali & Al-Balushi, 2016; Atzaba-Poria et al., 2014, as cited in Cabrera et al., 2017; Bright & Stockdale, 1984; Bustamante et al., 2020; Erätuuli & Sneider, 1990; Foutz &

Emmons, 2017; Gajda, Beghetto, & Karwowski, 2017; Gregoriou, 2019; MakEval, 2008; Mayfield & Mayfield, 2010; Murcia et al., 2020; Nemiro et al., 2015; Robson, 2012, 2014; Ruscio et al., 1998; Pitts et al., 2018; Proctor & Burnett, 2004; Renzulli et al., 2013; Richardson & Mishra, 2018; Russ, 1998 ; Schacter et al., 2006; Skard & Bundy, 2008; White et al., 2022; van Schijndel & Raijmakers, 2016). For both the caregiver behaviours and child creativity dimensions, the detailed coding manual (see Appendix J) includes verbal and non-verbal indicators.

The following section of the observational tool has been included to identify which type(s) of creative engagement(s) the child participated in during the observation period and which key element(s) of the exhibit the child (inter)acted with(in). This has been included because experiences can manifest through various types of engagement (see section 'Engagement' in Chapter Three), creativity is expressed in many domains and through various communicative manifestations (see section 'Responsivity to Engaged Activity, but Forgoing a Component of Task and Domain' in Chapter Six; see section 'Proposing and Defining a Sub-Construct: "Child Creativity"' in Chapter Six), children's museums are made up of a variety of exhibits that offer different types of play (see section 'What?' in Chapter Two; see Chapter Seven), museum engagement and creativity are influenced by visitor interests (see Chapter Three; see Chapter Six; see Chapter Seven), and evidence suggests that, in adults, creativity differs by domain (e.g., Kaufman, 2012).

In addition to recording the presence and/or level of various caregiver and child behaviour indicators, the observational tool has space for recording qualitative observation notes over the course of the observation period. This allows for the documentation of the sequence of inter(actions) between the caregiver and the child (with)in the exhibit environment. These notes can help capture reciprocal interactions and the interdependent (re)definitions of experiential engagement, particularly important as creativity is influenced by the temporal and spatial contingency of contributing variables (see section 'Necessitates Observation' above). This could also inform role patterns between children and caregivers, including whether caregiver support fades across the length of exhibit interaction (e.g., Braswell, 2012). Finally, as creativity unfolds over time (see section 'Creativity Unfolds Over Time' in Chapter Six) and caregivers can hinder their children's creativity by rushing their children's exhibit engagement (see Chapter Seven), the length of the observation is recorded.

To further support development of the observational tool, videos of parent-child interactions in a natural history museum, which had been recorded as part of a research study and made available to researchers on Databrary (n.d.) (Weisberg et al., 2023), and teacher-child interaction videos on Siren Films (n.d.) were used to reflect on initial caregiver behaviour items and child creativity dimensions. This resulted in fine-tuning of categories, their boundaries, and their descriptions in the detailed coding manual. As the field develops and the understandings of caregivers' creativity-related behaviours grow, future work could benefit from adding items that assess the quality or skilfulness of caregiver behaviours, rather than merely the presence or quantity of them (e.g., Katz-Buonincontro & Anderson, 2020; Schacter et al., 2006).

Since creativity is circumstantially conditional and situationally sensitive and, thus, influenced by elements of an individual's engaged activity (see section 'Responsivity to Engaged Activity, but Forgoing a Component of Task and Domain' in Chapter Six), it is critical to acknowledge that, similar to how creativity measures should not be used to compare individual children (see section 'The Purpose of Documenting Child Creativity' above), this observational tool should not be used to compare exhibits; however, it can be applied across exhibits.

Used on its own, this observational tool has great potential to be an informative starting point for children's museum professionals' critical reflections on caregivers' creativity-related behaviours, children's creativity during family visits, and their own museum design and practices. Moreover, this tool can be useful for assessing the effectiveness of the implementation of a caregiver-directed wise intervention. This observational tool could also be used in conjunction with other data collection tools (e.g., questionnaires) to support the further development of creativity understandings, conceptualisations, and theorisations (e.g., the influential weight of children's affective-conative states; museum visitation habits), as well as their practice-oriented applications (e.g., significant IMB model pathways for targeted caregiver-directed wise interventions) (e.g., see Appendix F).

Appendix S

Child Creativity During Family Visits to the Children's Museum:
Strengths, Weaknesses, Opportunities, and Threats

Strengths

The findings from the studies comprising this thesis suggest that children's museums' strengths for enhancing creativity lie (1) in institution-caregiver alignment regarding what children's museums are, including an opportune place for children's creativity, and how children's museum learning happens and (2) in their child-centred experience design and practices, particularly through offering a variety of exhibits with developmentally appropriate themes that provide materials for interactive and hands-on child engagement.

Understanding the Children's Museum

One concern about children's museums that has been seen as an obstacle in attracting and engaging visitors is their distinction from traditional museum institutions (see section 'What?' in Chapter Two; see section 'Where?' in Chapter Two; see section 'Who?' in Chapter Two). In particular, the shift from characterising the things of an exhibit as objects or artefacts, which is typical in traditional museums, to materials indicates a substantial shift in *how* learning happens at the children's museum: through hands-on (inter)action with(in) the museum, and marked by reciprocal determinism. Children's museum mission statements indicate that they prioritise this distinction, with "play" appearing as the third most frequent term in mission statements (49%) (see Chapter Five, Kupiec, 2024). In addition, "discovery", a form of generative engagement, is the third most frequent term (15%) in children's museum names after "child" and "museum" (see Chapter Five, Kupiec, 2024). Findings from Study 2 (see Chapter Seven) show that children's museum professionals believe that children's museums are distinct from other places children may spend their time, including traditional museums, because of their play-based, hands-on, and exploratory engagement, but that a general societal misconception of what children's museums are, including the precedent set by the term "museum" as indicative of being "hands-off", may leave caregivers uncertain. However, caregivers rank exploration as the top reason to visit a children's museum and being hands-on/interactive as the most important thing about a children's museum visit, while they rank inter-personal interactions (e.g., family, conversation) substantially lower and less important (see Chapter Eight). It is

apparent that caregivers do understand the hands-on ways in which visitors can and "should" (inter)act with(in) children's museums. This growing awareness and familiarity are strengths for children's museum family visits.

Another strength for children's museums is that the expanding understanding of the types of museum learning that can emerge from children's museum visits (see section 'Why?' in Chapter Two), including Lifelong Competencies (see Chapter Five, Kupiec, 2024), is acknowledged by caregivers. In fact, caregivers rank "learning" lower as a reason to visit a children's museum than they do "creativity" and "curiosity", suggesting an understanding that the benefits of children's museum visits may be unique from museums' traditional focus on content and factual knowledge learning (see Chapter Eight). In addition, findings across this work support an approach to group museum visits that acknowledges that, while being part of a joint visit experience, each visitor also simultaneously has their own experience, one which includes distinct museum learning that is marked by differences between child and caregiver roles (see section 'Roles' in Chapter Three). For instance, museum professionals noted that caregivers are afforded opportunities to learn about their children in the museum (see Chapter Seven), and nearly half (47%) of all caregivers selected watching their child to learn about their child as one of the three most important adult roles during children's museum visits (see Chapter Eight).

Finally, a strength of alignment is the acknowledgement across institutional, museum professionals', and caregivers' voices that the children's museum is a place for children's creativity, a particular type of engagement and museum learning: it is a priority to children's museums (see Chapter Five, Kupiec, 2024), it is discussed across the museum and designed for by museum professionals (see Chapter Seven), and opportunities for children's creativity are recognised by caregivers (see Chapter Eight).

Although identified as a strength, it should be noted that future research is necessary, particularly in light of a limited homogenous sample that has constrained the work (see section 'Echoing Tensions of Power and Equity' in Chapter Nine). For example, that findings from Study 3 (see Chapter Eight) suggesting that caregivers are familiar with children's museums and understand them as places for hands-on engagement (see Chapter Eight) contrast with Study 2 (see Chapter Seven) findings that children's museum professionals believe that caregivers may not know what a children's museum is or how to

engage during their visits (see Chapter Seven) may, in part, reflect a sample that is representative of museumgoers.

Experience Design: Child

The most obvious strength for children's museums in enhancing creativity during family visits is their physical environments, particularly the interactive and hands-on engagement they not only invite but also explicitly provide for. In fact, interactive and hands-on elements are the most frequently mentioned qualifying theme across mission statements for indicating how children's museums aim to design the museum environment and experience for creativity (see Chapter Five, Kupiec, 2024). Further, findings from Study 2 (see Chapter Seven) show that children's museum exhibits do offer a variety of loose, sometimes undefined, parts, supplies, and props that support interactivity and open-ended, and at times messy, play. Museum professionals reported that these elements provide greater possibilities and significantly contribute towards children's creativity. While not mentioned in mission statements and not evident in all children's museums, many museum professionals also recognised the provision of costumes, which permit children to take on different perspectives and develop narratives in role-play, as significant in enhancing children's creativity.

Another strength of the opportunities that children's museums offer is that they draw upon real-life links *and* provide "only at" activities, including novel materials and unique ways of engaging with them (see Chapter Seven). By offering novelty and undefined possibility anchored in the familiar, children are likely to be invited to integrate what they already know with their present moment and context, supporting their creativity (see section 'Proposing and Defining a Sub-Construct: "Child Creativity"' in Chapter Six). Furthermore, tangible spatial design and aesthetic elements can elicit intangible feelings (Lee, 2018), which may influence a visitor's affective-conative states and, thus, their creativity (see section 'Feeling' in Chapter Six). Evidence from this work suggests that many considerations of children's museums' general physical environments are likely to enhance children's creativity. These include that exhibits are ergonomically designed for children, accommodate multi-user engagement, permit free movement and self-direction, and are aesthetically designed (e.g., using colour, incorporating visual interest intended to be inspirational) (see Chapter Seven).

Additionally, findings of Study 2 (see Chapter Seven) indicate that children's museum professionals understand that children's creativity is influenced by variables of their visitor portrait, including a child's personality, affect, age, developmental stage, background, prior visitation, interests, preferred type of play, mobility, and neurodivergence. While creativity can vary between exhibit factors (e.g., themes, provided materials, the type(s) of play invited (e.g., role-play, building or construction, art)), these findings also show that each children's museum provides a variety of exhibits and materials to accommodate a diversity of person-environment fits. Moreover, caregivers do not only recognise the children's museum as a good place for children to be creative in general, but they similarly highly agree that there are many different ways for children to be creative at a children's museum (see Chapter Eight). As well as offering a variety of opportunities, supporting creativity can require a balance of variables (e.g., boring versus overwhelming: Amabile, 1998; stimulation and reflection: Abdulla & Cramond, 2017). Museum professionals report balance both across the museum (e.g., offering quiet spaces) and within exhibit activities (e.g., providing materials and examples with some familiarity and cue without being too generic) (see Chapter Seven). Together, the variety of opportunities and their balanced tempo (see section 'Variety' in Chapter Three; see section 'Balance' in Chapter Three) is likely to increase visitors' comfort, intrinsic motivation, and personal interest, affective-conative states that could further enhance creativity. Significantly, the elements discussed here as enhancing children's creativity are also recognised as relatively important to caregivers, as 54% of caregivers in Study 3 (see Chapter Eight) felt that having a variety of exhibits and materials to choose from is one of the most important things about children's museum visits, and 42% selected doing something they could not elsewhere.

While observational learning is an important avenue for museum learning (see section 'Observation' in Chapter Three), museum professionals identified that it could also be a potential hindrance to creativity, such as if it led to imitation or children wanting to do things "the right way" (see Chapter Seven). Thus, in addition to opportunities that predominantly prioritise open-ended engagement, a strength of children's museum experience design is the intentionality of offering opportunities for a creativity-enhancing form of observational learning, including by modelling *engagement* of creativity in exhibit spaces to serve as inspiration without over-prescribing what its generativity *should* be (see Chapter Seven).

The last significant strength of child-centred, creativity-enhancing museum practice is the staff. They both draw upon their own creativity during the experience design process *and* support children's creativity through their facilitation practices, primarily by using open-ended scaffolds and prompts (see Chapter Seven).

Weaknesses

Significant weaknesses in enhancing children's creativity during children's museum family visits that have been identified across the present body of work include (1) the lack of a shared language of child creativity and a way to identify and measure it, and (2) children's museum experience design and practices regarding how caregivers are engaged during family visits and, less so, how visitors across visiting groups are engaged in interacting with one another.

Understanding Child Creativity

A significant weakness for children's museums in optimising their spaces for creativity is that museum professionals lack clarity and consistency in defining and understanding what child creativity is, what it would look like, and how it relates to, and is different from, general museum engagement (e.g., exploration, discovery) (see Chapter Seven). This work has proposed and defined a sub-construct of creativity: "child creativity" (see section 'Proposing and Defining a Sub-Construct: "Child Creativity"' in Chapter Six), which holds promise to be a meaningful contribution in supporting productive conversations, thereby strengthening the field

One specific child creativity (mis)understanding that has been identified through this work as inconsistent relates to the widely held myth that creativity is primarily associated with art-related activities (e.g., Robinson, 2009). For instance, only three mission statements discussed planning for creativity through a specific domain (e.g., STEAM, history, art) (see Chapter Five, Kupiec, 2024); however, the only exhibits across the walking interviews that explicitly used the term "creativity" in their title were arts-prominent (see Chapter Seven). This suggests an institutional weakness in narrowing their message and, potentially, limiting their support for all applications, uses, and manifestations of creativity when implementing their intended practice. A similar discrepancy was identified in the ways that museum professionals expressed their personal conceptualisations of child creativity; despite saying, quite emphatically at times, that creativity is for all types of applications and domains, they often noted when arriving at art studio and makerspace exhibits that these were the most

creative spaces in the museum (see Chapter Seven). These biases and inconsistencies nested in children's museums' implemented practice and museum professionals' beliefs could potentially contribute to or reinforce caregivers' misunderstandings, especially as caregivers expressed less agreement on whether other subjects and activities or art are the most creative than they did other creativity-related information statements (see Chapter Eight). Together, these inconsistencies could inadvertently prevent museum professionals and/or caregivers from facilitating, supporting, and encouraging the many unique ways that children engage with and express creativity across the variety of children's museum opportunities.

Another significant weakness related to not having a shared language for child creativity is that, although museum professionals discuss creativity and share anecdotes, their perceptions and thus their identification of creativity problematically rest on personal, implicit definitions (see section 'A Limited "Standard Definition"' in Chapter Six; see section 'Leaving Creativity Undefined' in Chapter Six) (see Chapter Seven). Children's museum professionals' reliance on anecdotal evidence identified through personally implicit definitions may be contributing to the lack of within-institution agreement about the creative potential of individual exhibits that was identified in Study 2 (see Chapter Seven). Moreover, although mission statements should serve as the benchmark for determining museum success (American Alliance of Museums, n.d.-c; see section 'Internal Communication' in Chapter Five, Kupiec, 2024), children's museums do not have a tool for measuring child creativity (see Chapter Seven). Thus, in addition to benefitting from a shared language, if there were a way to measure creativity, it is likely that children's creativity and the conditions that support it could be better understood, contributing towards creativity-enhancing design and practices. Furthermore, this work has identified that caregivers' behaviours may influence their children's creativity (see Chapter Seven). As such, it is also important to be able to capture caregivers' creativity-related behaviours and explore potential intra-group reciprocal determinism (see section 'Reciprocal Determinism' in Chapter Three), such as whether more creative children elicit more creativity-enhancing behaviours from their caregivers, and/or vice versa.

Identifying children's creativity could further support better understanding the outcomes it mediates towards and planning for these. In fact, mission statements specify that creativity is an important mediator towards other children's museum goals (e.g.,

learning, engagement, affect) (see Chapter Five, Kupiec, 2024), and nearly half of caregivers' definitions of "child creativity" recognised creativity as a mediator that can lead to a variety of beneficial outcomes (e.g., learning, having fun, expressing or learning about oneself) (see Chapter Eight). However, museum professionals expressed uncertainty about the relationship between learning and creativity across exhibits (see Chapter Seven). As understanding the benefits of creativity contributes to caregivers' high level of creativity-related motivation (see Chapter Eight), clarifying and harnessing the secondary benefits of creativity during children's museum family visits could support caregivers in valuing creativity as a form of museum engagement and, thus, in enacting creativity-enhancing mindful behaviours.

Finally, museum visits and creativity are both experiences (see Chapter Three; see Chapter Six). Interestingly, "learn" appeared in 59% of children's museum mission statements and "play" in 49%, suggesting that, while both experiential elements are important, children's museums may institutionally prioritise experiential generativity over engagement (see Chapter Five, Kupiec, 2024). In contrast, findings from Study 3 (see Chapter Eight) suggest that caregivers prioritise engagement over generativity. Not having a clear goal to guide their children towards could be one reason why caregivers may not facilitate, support, or participate in the visit as much as museum professionals may hope for. In addition, "experience" is the most frequent theme for how children's museums aim to achieve creativity (see Chapter Five, Kupiec, 2024). While nearly all caregivers' definitions of "child creativity" incorporated an element of engagement, findings from their creativity-related information understandings suggest that they may not believe effort and time are essential for creativity (see Chapter Eight). While having a variety of experiences can support the growth of creativity, experiential disengagement, such as that which results from moving between them quickly, may result in limited, or even a complete lack of, change from a single episode of creativity (see section '(Mis)match' in Chapter Three). Therefore, findings that caregivers may hinder their children's creativity by rushing them between exhibits (see Chapter Seven) may reflect caregivers' misunderstanding of the value of time for each engaged activity in comparison to the benefits of exposure to many shorter engagements. Caregivers' potential difficulty with recognising and balancing both engagement and exposure during children's museum visits could be considered a weakness in enhancing children's creativity during children's museum family visits.

Experience Design: Caregiver

Children's museums are intended to cater to children and their caregivers (see Chapter Two, section 'What?'). This is acknowledged in the Visitor Experiencescape, in which a "visitor" can refer to (1) an individual or (2) a visiting group, such as a family (see section 'Visitor Experiencescape: Visitor Portrait' in Chapter Three; see section 'Roles' in Chapter Three). It is also reflected in children's museum mission statements: "family" is the fifth most commonly appearing term (26%) (see Chapter Five, Kupiec, 2024). Moreover, mission statements specifically indicate that experiences and environments characterised with *family-friendly* features are an intended practice for achieving creativity aims (see Chapter Five, Kupiec, 2024). However, although experience design for child engagement is a strength of children's museum design and practices, including enhancing creativity (see section 'Experience Design: Child' above), a weakness identified through this body of work is that substantially less implemented practice seems to be designed with the caregiver at the forefront, despite their central but unique role during family visits and the acknowledged influence of their behaviours on children's creativity (see section 'A Focus on Family Visits' in Chapter Three; see section 'Caregivers in Family Visits' in Chapter Three; see Chapter Seven). In fact, findings suggest that caregivers recognise children's museums as a good place for children to be creative, but the strength of their agreement is nearly half when it comes to whether children's museums are a good place for adults to be creative (see Chapter Eight).

Furthermore, caregivers do not believe it as important for an adult to interact with their child at the children's museum (e.g., learning alongside their child, joining their child's play as a playmate) as it is to manage their child and their visit from outside the play frame (e.g., supervising, stepping back, watching child) (see Chapter Eight). This could, at times, hinder children's creativity (see Chapter Seven). Notwithstanding the influence of their general engagement behaviours, caregivers might feel that adults should not participate in children's creativity altogether. For instance, as reflected in their definitions of "child creativity", caregivers may believe that not only do children need permission and freedom to be creative, but also that any caregiver involvement hinders their creativity (see Chapter Eight). Without implementing explicit, caregiver-directed design and practices, including those to shift caregivers' beliefs, children's museums may not be optimally engaging their audiences to achieve institutional aims, including creativity. Undertaking efforts that

consider caregivers and their beliefs as the starting point for decision-making would likely be particularly fruitful in strengthening children's museum design and practices to support caregivers and, consequently, enhance children's creativity.

Experience Design: Across Group Interactions

In addition to who visitors come to the museum with, an important variable of their social situation is who they interact with during their visit (see section 'Visitor Experiencescape: Social Situation' in Chapter Three). "Community" is in 21% of children's museum mission statements (see Chapter Five, Kupiec, 2024), and visitors coming across difference and collaboratively playing together are not just important to museum professionals—they also view these aspects of community as significantly unique benefits of children's museums (see Chapter Seven). However, caregivers feel that community is the least important reason to visit children's museums and, further, no participant of Study 3 selected playing with other visitors as one of the three most important things about a children's museum visit (see Chapter Eight). Moreover, despite its overall prevalence in mission statements, only in one mission statement was "community" a way that children's museums intend to achieve creativity (see Chapter Five, Kupiec, 2024). Similarly, although findings suggest that museum professionals often see and value when visitors and their engagements spontaneously inspire each other's creativity (see section '(Un)predictability' in Chapter Three), this was rarely identified as a significant factor or intentional consideration during design and practice decision-making (see Chapter Seven).

The limited explicit experience design to support both intra-group (i.e., children with their caregivers) and inter-group (i.e., children with other visitors) creative engagement is a notable divergence from institutional emphasis and a weakness of current children's museum design and practices. Future work is needed to better understand which museum experience elements may enhance creative interactions amongst visitors (e.g., group creativity) rather than simply between visitors (e.g., passive inspiration via the CLOVER's environment leaflet), as well as to explore the similarities and differences in how these two routes of engagement impact children's creativity.

Opportunities

Three promising opportunities for children's museums to enhance children's creativity lie in (1) supporting caregivers to enact creativity-enhancing mindful behaviours during family visits, particularly through the application of a wise intervention approach; (2)

applying Social Learning Theory to better understand and design for creativity-enhancing affective-conative states; and (3) encouraging creativity-oriented collaboration across children's museums, potentially framed by principles of implementation science.

Caregiver Support through Wise Intervention

Each of the three different voices captured by the empirical studies of this thesis recognise the children's museum as an opportune place for children's creativity (see section 'Understanding the Children's Museum' above). However, the outcomes of a children's museum visit are not determined solely by the potential of what *could* be learned, but also by *how* visitors (inter)act with(in) the museum and its exhibits. Findings of Study 2 (see Chapter Seven) identified that the most promising opportunity for enhancing children's creativity during children's museum family visits may lie in the untapped potential of mobilising caregivers, particularly in supporting them to enact mindful behaviours.

Experience design that offers effective support and guidance to caregivers is both important and possible during family museum visits (see section 'Caregivers in Family Visits' in Chapter Three). In fact, upon entering a new place, a supportive link, including one that encourages goal consensus and offers orientation, can improve the developmental potential of a setting (Bronfenbrenner, 1979). Children's museums can provide such a supportive link to caregivers by implementing efforts to help reduce the misalignment between their beliefs and expectations and those of caregivers. While a wealth of research suggests that conceptual and physical orientations can effectively reduce visitor uncertainty, cognitive load, overstimulation, and museum fatigue while also increasing comfort, belongingness, engagement, and learning (Bitgood, 1994; Hein, 1998; Hooper-Greenhill, 1994; Loomis, 1987; see section 'Creativity-Specific Visitor Support' in Chapter Seven), an opportunity for children's museums could be expanding orientation efforts to include behavioural orientation. In fact, children's museums are distinct from other museum institution types in part because of the different behavioural affordances they permit and the hands-on interactivity they invite (e.g. Lewin, 1989; see section 'The Children's Museum' in Chapter One; see section 'Where?' in Chapter Two; see section 'Insufficiencies Pronounced in the Children's Museum' in Chapter Three). Although it is a strength that there is caregiver-children's museum alignment in this understanding (see section 'Understanding the Children's Museum' above), and that caregivers report that they would be comfortable playing with their children at a children's museum (see Chapter Eight), museum

professionals believe that caregivers may not always know *how* to play with their children (see Chapter Seven). This belief is supported in relation to creativity-enhancing behaviours by findings that caregivers have a significantly lower understanding of creativity-related behavioural skills than motivation and, moreover, that they ranked strategies to help their children be more creative as what they would most like to learn about creativity (see Chapter Eight).

As museum visits are free-choice experiences, the museum environment needs to be controlled enough to guide visitors, but open-ended enough for them to have a sense of freedom (Hein, 1998). Chapter Eight argued that the brief and minimally directive approach of wise interventions holds great promise for museum settings, including due to museum visits' short durations, infrequency, personalisation, and long-lasting impact, and, further, that the IMB model may be a helpful approach to framing caregiver-directed behaviour change efforts. Guided by these approaches, findings in Chapter Eight suggest that one promising avenue for supporting caregivers in enacting creativity-enhancing behaviours during family visits may lie in focusing on shifting caregivers' perspectives, such that they better recognise the children's museum as an opportunity for them to facilitate their children's creativity and to be creative alongside and with their children. Findings also suggest that these efforts may be most accepted and effective as personal interactions or videos that highlight information about the conditions that support children's creativity and that demonstrate and teach about creativity-related behavioural skills. Optimising their resources and respecting that, in the museum context, caregivers do not believe it is important to interact with others, including museum staff (see Chapter Eight), museum efforts should prioritise exploring the potential of caregiver-directed videos. In fact, museums often show videos to support visitors in learning about exhibit themes, and during the museum visit, caregivers both learn about their children and believe that doing so is an important role for an adult during their visit (see section 'Roles' in Chapter Three; see Chapter Seven; see Chapter Eight). Lastly, visitors' entry agendas and expectations shape their museum experiences (see section 'Why?' in Chapter Two; see section 'Microexperience' in Chapter Three), and supporting changes in individuals' subjective meaning-making may be most effective when done early in an experience (Walton & Wilson, 2018). As such, the greatest opportunity for museums to orient visitors towards

creativity and provide caregiver-directed support would likely be at the *beginning* of families' visits.

While children's museums prioritise families (see Chapter Five, Kupiec, 2024), that there is no one type of caregiver or caregiver need is represented by the visitor portrait of the Visitor Experiencescape (see Chapter Three), respected by museum professionals (see Chapter Seven), and supported by caregivers' survey responses (see Chapter Eight). Evidence from Study 2 (see Chapter Seven) suggests that creativity-enhancing mindful behaviours can be either hands-on *or* hands-off and, further, that each caregiver role comprises a variety of behaviours to enact. As families and caregivers bring a diversity of family practices and worldviews with them to the children's museum, which inform how they participate and behave, wise interventions are particularly well-suited for this work. In fact, Walton and Wilson (2018) acknowledge that

> Interveners cannot anticipate everything, however, particularly not each recipient's personal context. Thus, intervention exercises should both be built to clearly convey the important psychological idea but also to allow recipients to customize that content in ways that make it maximally relevant and helpful for them. (p. 638)

As a result, and similar to how children's museums design for a variety of children's interests and needs (see section 'Strengths' above), in optimising caregiver-directed museum practice, it is essential to provide caregivers with a variety of creativity-enhancing mindful behaviours they can draw upon and enact, including those that support hands-on behaviours (e.g., asking open-ended questions, role-playing together with their child, explicitly telling their child to be creative) and those that support hands-off behaviours (e.g., tolerating appropriate levels of noise and mess, allowing sensible risk without intervening, giving their child the time to work at their own pace, modelling creativity by engaging in their own personal creative activities).

Finally, investigating the differences between caregivers' hands-off and hands-on behaviours would provide a unique opportunity to explore the differences between children's creativity that unfolds individually but is influenced by how their caregivers contribute to their social environment, as represented by the CLOVER, and that which emerges through group creativity. Valuable for advancing current understandings in the field of creativity, such work would also contribute to understandings of intergenerational

group creativity (see section ‘Group Creativity’ in Chapter Six; see section ‘Family Visits’ in Chapter Six).

Social Learning Theory for Supporting Affective-Conative States and Creative Self-Beliefs

Creativity depends on an individual’s situational affective-conative states (see section ‘Feeling’ in Chapter Six), which this work has argued may have a heightened influence in children (see section ‘Children Versus Adults: Rebalancing the Relative Weight of CLOVER Components’ in Chapter Six). Thus, beneficial for enhancing creativity, mission statement analysis suggests that children’s museums’ intended practice for achieving creativity goals includes designing experiences and environments that elicit a positive affect (see Chapter Five, Kupiec, 2024). Moreover, 62% of caregivers believe that having fun is one of the three most important things about a children’s museum visit, second only to being hands-on/interactive (75%), and, additionally, they believe that an individual’s mood influences their creativity (see Chapter Eight). However, though museum professionals recognised that negative affective-conative states (e.g., fear) are likely to hinder children’s engagement and creativity, they did not necessarily recognise this link between children’s positive affective-conative states and their creativity, despite often discussing exhibits as fun, enjoyable, and something that children loved (see Chapter Seven). Further, findings from Study 3 (see Chapter Eight) suggest that caregivers might benefit from gaining confidence in their own creativity, and evidence suggests that creative self-efficacy is situationally elicited and that creative anxiety is domain dependent (Daker et al., 2020; Karwowski et al., 2019). These findings from Studies 2 and 3 of this thesis support meta-analytic evidence that negative moods oriented towards avoidance and prevention (e.g., fear, anxiety) decrease creativity (Baas et al., 2008).

It is evident that museum-elicited affective-conative states contribute to visitors’ creativity. Despite children’s museums being environments that prioritise and are valued for positive emotional engagement, an opportunity for enhancing creativity during children’s museum family visits lies in not only minimising the hindering impact of negative affective-conative states, but also in appreciating and harnessing the creativity-enhancing influence of positive affective-conative states in children and caregivers alike. Thus, supporting museum professionals in drawing this link could lead to more optimal creativity-enhancing design and practices that contribute to maximising visitors’ positive affective-conative states and, in turn, their creativity. This may be particularly beneficial for children who, as

proposed in this thesis, are in a critical developmental period, one in which their creative self-beliefs may form (see section 'Critical Developmental Period in Childhood' in Chapter Six). In fact, in light of their findings that adolescents' creative metacognition and creative self-beliefs mediate the effects of diverse creativity-influencing factors (e.g., conative, cognitive, environmental, and personal factors) on their creative production, Anderson and Haney (2021) highlighted the importance of explicitly supporting them by asserting the following:

> The effort to support students' creative development in school should include, not only the typical creative thinking often associated with creative potential, but also the self-beliefs and metacognitive capacities that fuel the agency to create and give shape to the possible. (p. 624)

Museum engagement both relies on and contributes to various types of visitors' self-efficacy beliefs, which, in turn, influence their engagement and learning (see section 'Efficacy' in Chapter Three). In fact, findings suggest that children's fear of failure could be counteracted by comfort gained through repeated museum visits (see Chapter Seven). Findings also suggest that supporting caregivers' creative self-efficacy may hold promising potential for encouraging them to engage in creativity with and alongside their children during children's museum family visits (see Chapter Eight). Thus, the contribution of framing museum learning with a Social Learning Theory lens that explicitly considers the concept of efficacy offers an opportunity to explore how to enhance creativity during and as a result of children's museum family visits (see section 'Fit of Applying Social Learning Theory' in Chapter Three), and to examine the influence of creative activities on visitors' affective-conative states, as well as the influence of visitors' affective-conative states on their creativity.

Collaboration Across Children's Museums

Research findings can only *contribute* to practice, rather than prescribe it, because "educational practice consists of situations that in a sense are always new and unique" (Biesta, 2007, p. 299). Nonetheless, a notable opportunity for enhancing children's creativity is inter-institutional collaboration, and findings suggest that it is possible to implement shared practices while retaining local sensitivities.

Findings from Study 2 (see Chapter Seven) suggest that children's museums engage in informal visitor observations and, less often, formal evaluations, which they use to make

specific exhibit changes in a process reminiscent of improvement science (e.g., the Plan-Do-Study-Act cycle: Lemire et al., 2017). This exhibit-specific focus is relatively unsurprising. In fact, while children's museum professionals most want to know the impacts and outcomes of children's museum visits and which factors contribute to these, they are least interested in knowing "best practices" (Luke & Windleharth, 2013). One reason for this could be that children's museums may share aims, theoretical underpinnings, and pedagogical approaches, but they use their own contexts when translating them into practice (Carter, 2017; Mayfield, 2005).

Despite children's museum professionals' beliefs that children's museums are not only distinct from other places in children's lives, but that they each also have their own identity and themes (see Chapter Seven), prior research suggests that frameworks, common language, and identified facilitation techniques that can be flexibly draw upon with situational responsiveness do support practice in informal settings (e.g., White et al., 2021). In fact, findings from Study 2 (see Chapter Seven) suggest that children's museums are often in dialogue, both formally and informally, with each other and with other museum institution types that have child-focused spaces and practices. Moreover, museum professionals discussed across-museum collaborative exchanges and external site visits with enthusiasm, and they shared how these inform their own museum decisions. However, although "creativity" is the sixth most frequent term in children's museum mission statements, appearing in 26% (see Chapter Five, Kupiec, 2024), and there were no significant discrepancies in design and practices between children's museums that had "creativity" in their mission statements and those that did not, there was no evidence that these collaborative efforts addressed creativity (see Chapter Seven). As it is clear that creativity is a central priority with high interest across children's museums, a significant opportunity is, thus, to hold space for and encourage creativity-oriented discussions and collaboration.

Children's museums are non-profit organisations, which means that their capacity to implement new design elements and practices may differ; however, their existing collaborations and knowledge exchange suggest organisational acceptability and readiness to change (Halle et al., 2013). One potentially productive opportunity for framing this work and these discussions is through the lens of implementation science. This might especially support smaller children's museums, as they are more limited in their resources and

capacity to do evaluation, yet they make up a large proportion of children's museums (Luke et al., 2021), indicating great potential for impact.

Threats

The threats identified through this work as most likely to be significantly counterproductive in enhancing children's creativity during children's museum family visits are (1) internal communication and external funding sources, (2) caregivers' expectations and beliefs, and (3) tensions of power and equity. These threats also constitute key areas of focus that future work can, and should, address in order to support children's museums' in fulfilling their creativity-enhancing potential during family visits.

Institutional Obstacles

The present work's focus on creativity was informed through a progressive focusing approach that drew upon findings of a mission statement analysis (see Chapter Five, Kupiec, 2024). Although mission statements should be used as a benchmark for museum evaluation (American Alliance of Museums, n.d.-c; see section 'Internal Communication' in Chapter Five, Kupiec, 2024), they may be primarily used for public perception and public relations purposes instead of guiding internal institutional direction and decision-making (see section 'Limitations and Future Directions' in Chapter Five, Kupiec, 2024). Unsurprisingly, then, one way that children's museum professionals in Study 2 (see Chapter Seven) reported signalling to visitors that the children's museum is a place for them to be creative was through general public-facing materials (e.g., marketing, mission statements, website). Nonetheless, and suggesting a supportive institutional ethos, museum professionals also reported that creativity *is* internally discussed, both during board meetings and regularly within their staffs; however, for many participants, such creativity-related conversations did not seem explicit and/or at the forefront of their practice. In fact, creativity was only reported once as a consideration during the start of an exhibit design process.

In addition, while "for practitioners, the most obvious advantage to knowing about research lies in using it to inform design decisions" (Gutwill, 2016, p. 205), institutionally, "evaluation data may simply not be as important as the influence of an outside source, such as a trustee board or a municipal budget authority" (Loomis, 1987, p. 12). In fact, prior work suggests that board members do not always act on research findings, even when these come from within their own spaces (Weiland, 2015, p. 103; see section 'Evaluation' in Chapter Seven). Although findings from the walking interviews with museum professionals

suggested a strong commitment to creativity, institutional obstacles that could serve as a threat to accomplishing them were also identified, including restrictive external partnerships and funders (see Chapter Seven). As a result, even if children's museum professionals are equipped with the language and tools to support and measure children's creativity, their decisions could be shaped by more distal voices, which could limit their efforts to implement creativity-enhancing design and practices.

Placed into dialogue with caregiver perspectives from Study 3 (see Chapter Eight), it is promising that caregivers do recognise a variety of opportunities for children's creativity in children's museums, suggesting that children's museums are able to support creativity within constraints. Even so, caution remains in being able to optimise efforts that could maximise children's creativity.

Caregiver Expectations and Beliefs

Wise interventions hold great potential for the museum context in part because they focus on changing perspectives rather than directing individuals or their actions. This work has identified that supporting caregivers in enacting mindful behaviours may be a promising avenue for enhancing children's creativity during children's museum family visits (see Chapter Seven; see section 'Caregiver Support through Wise Intervention' above). However, as museums are free-choice environments, it is imperative to consider caregivers' beliefs and expectations, as these inform the in-museum choices they make. In fact, while they remain important for understanding visitors, inclusion efforts need to expand beyond the narrow focus on sociodemographics that has traditionally defined them to also include diverse intraindividual cognitive and conative-affective variables (e.g., prior knowledge, interests, values, visit motivations and expectations, concept of self, goals), as captured by the visitor portrait of the Visitor Experiencescape (see section 'Visitor Experiencescape: Visitor Portrait' in Chapter Three).

Despite identifying caregiver-children's museum alignment regarding what children's museums are and the hands-on engagement through which learning happens as a strength (see section 'Strengths' above), this work has also found that caregivers may not believe it is their responsibility to (inter)act with(in) their child and the children's museum during their visits (see Chapter Eight). Nonetheless, children's museums prioritise both children and families (see Chapter Five, Kupiec, 2024), and museum professionals hope for and

appreciate caregiver participation (see Chapter Seven). This presents a key misalignment that could threaten the effectiveness of caregiver-directed, creativity-enhancing efforts.

Although museum professionals respect and understand that caregivers may sometimes come to the museum as a safe and educational place for their children when they need a break themselves, they also express wanting caregivers to engage with their children's activities and play alongside them (see Chapter Seven). On the other hand, findings from Study 3 (see Chapter Eight) show that even though caregivers report most wanting to learn about strategies to support children's creativity and would feel at ease playing with their children in children's museums, they do not necessarily believe it is an important role for them to fulfil during their visits. This suggests that caregivers may perceive children's museums not only as child-centred and child-driven, but rather as child-exclusive spaces in which they are not meant to be active participants themselves; if so, efforts to support them in being mindfully (dis)engaged may be futile. In other words, even if an intervention were to successfully support caregivers' recognition of opportunities for them to support their children's creativity, as well as increase their motivation (e.g., social acceptability, positive effects) and behavioural skills (e.g., self-efficacy) to enact creativity-enhancing behaviours in the children's museum context, concerns of burden might prevent them from developing an intention to engage with the opportunities to do so (Casale et al., 2023). If this were the case, potential benefits for children could be threatened by caregivers choosing not to enact creativity-enhancing mindful behaviours during their visits. It is important to note that, as restoration is an important motivation for and outcome of museum visits (see section 'Why?' in Chapter Two), it may be counterproductive to expect caregivers to always be mind-on, as this may preclude them from having an opportunity to temporarily be mind-off when they may need and benefit from it most. Though museum professionals did acknowledge this possibility (see Chapter Seven), future work endeavouring to better understand this misalignment is needed.

Caregivers report that they would most like to learn about creativity through watching others successfully support creativity or talking with an expert (see Chapter Eight). Aligning with this, current children's museum practice relies on facilitation as a dominant strategy to support caregivers and enhance family engagement, including creativity (see Chapter Seven). However, caregivers do not consider interacting with museum staff to be an important part of a children's museum visit (see Chapter Eight). Thus, in addition to findings

that suggest caregivers may not recognise the children's museum as a place for their engagement generally, if museum professionals are prioritising and drawing upon a museum practice (i.e., staff facilitation) that caregivers do not feel is important about their visit, as evidence suggests, they might be even less likely to engage with it. Consequently, an additional threat to enhancing children's creativity through caregiver-directed support is *how* museums are offering orientation and incorporating guidance. To address this, one promising strategy identified through this work for the field to explore is the implementation of caregiver-directed videos.

Tensions of Power and Equity

While a strength of children's museum design is the inclusion of a variety and balance of exhibit themes, types of engagement, and materials to accommodate a diversity of individual differences, such as learning styles, interests, and preferred forms of creative expression (see section 'Strengths' above), the most significant threat to enhancing children's creativity in children's museums lies in the museum-visitor tensions of power and equity.

"Child" is, unsurprisingly, the most frequent term in children's museum mission statements (appearing in 60% of all children's museum mission statements), "family" (26%) is the fifth most frequent, and "community" (21%) the tenth (see Chapter Five, Kupiec, 2024). As such, museum design and practices need to not only consider family behaviours that occur within the museum, but also family practices from across the community. Findings of Study 2 (see Chapter Seven) suggest that museum professionals are reflective and self-critical in some ways (e.g., using their own creativity, thoughtful implementation of technology, careful use of examples) but not others (e.g., power). For instance, this work shows that children's museums may, at times, believe it is their responsibility to model a way of educating and to help visitors "understand" how to learn from it (see Chapter Seven). However, the (mis)match between visitors' behaviours in the museum and institutional expectations might also reflect family practices brought *to* the museum rather than simple misunderstanding. As a result, findings that illustrate how museum professionals are seeking to bridge gaps through familiarity (e.g., bringing nonvisitors to the museum for them to "get it", visit frequency) and teaching or explaining opportunities for and ways of engaging (e.g., understanding the name "museum" may not be good, staff facilitating hands-on interactions) (see Chapter Seven) are problematically asking visitors to

accommodate museum practice, rather than serving to resolve mismatch through match. While building efficacy to engage with museums through museum engagement and familiarity is important (see section 'Efficacy' in Chapter Three; see section 'Social Learning Theory for Supporting Affective-Conative States and Creative Self-Beliefs' above), including in enhancing children's creativity (see Chapter Seven), it is also necessary to understand the differences and misalignments between museum practice and family practice in order to more equitably serve all audiences (see section 'Equity' in Chapter Three). Without this, a significant threat to the field remains museum design and practices that benefit a narrow slice of the population instead of the very community that museums set out to serve.

If museum practice remains at odds with family practice, visitors may have little comfort, interest, efficacy, and motivation to engage. Applied to the present focus on children's creativity and caregivers' creativity-enhancing behaviours, such limited positive affective-conative states could result in potential creative experiences being stifled, or worse, sacrificed. Future research examining connections between the variety of visitors' observable behaviours *in* the museum and their family practices brought *to* the museum may provide an important starting point for understanding how family visiting groups experience mismatch in the children's museum context. These insights could lay a foundation for exploring how to jointly close, rather than unidirectionally bridge, these gaps, such that all visitors can experience optimised museum design and practices that maximise their museum learning.