**Exploring the writer's toolbox:**
**a study of how writers and their use of writing implements and surfaces relate to their ways of thinking for writing**

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*Dissertation submitted to the University of Oxford in partial fulfilment of the requirements for the Degree of Doctor of Philosophy.*

*Trinity 2015* *Harris Manchester College*

## Acknowledgements

I have had the great fortune of learning from and working with exceptional individuals throughout this project. At times when profound gratitude is felt, words seem to fail. This, however, is a study on writing, and so one must try.

This thesis has benefited from the supervision of the insightful, conscientious, and ever knowledgeable Dr Chris Davies. I am endlessly grateful to him for his wisdom and patience, and for the many hours and thoughts that he contributed to this project.

Without the five students who participated in this study, this thesis would not have been achievable. Their generosity of time, words, and spirit made the research both enjoyable and engaging.

I remain indebted to Sir John Hood for his conversation, encouragement and understanding. His singular intellect and invaluable guidance have inspired numerous ideas raised throughout this thesis.

Finally, I am and always will be grateful to my family. Their love keeps me whole.

## Abstract

The state of writing abilities throughout the United States presents an urgent issue. Low student achievement in English Language Arts (ELA) exams and standardized English assessments persist (National Center for Education Statistics, 2012), while businesses spend billions of dollars on remedial writing instruction (Dillon, 2008). Technology is increasingly cited as a potential solution to these issues. Evidence for this is limited, as is existing research into the basis of the issues that technology might address. On account of that context, this thesis turns to a basic distinction between digital and non-digital writing: the writing surface and implement, or pen and paper – screen and keyboard. Conceptualizing such artefacts through a view of writing as a way of thinking raises the following question, which is this study's guiding inquiry. Might we use digital implements and surfaces to support the ways of thinking involved in composing written works of semantic cohesion?

Building on research into writing as thinking, the study presented in this document analyses how uses of writing surfaces and implements relate to ways of thinking while writing, and which contextual factors influence those relationships. Drawing on a neuro-anthropological approach, the study focuses on the writer's mind as the driver and source of the lived experience of writing. Expert writers, therefore, are considered to be those who exhibit the ways of thinking while writing to which other writers aspire. To examine a range of uses of writing surfaces and implements with reference to expert writers' ways of thinking, the study was conducted in two parts. Part 1involved a content analysis of published interviews with professional writers. This generated a framework through which to conduct in-depth qualitative research with college student writers – part 2.

This thesis is as much about thinking while writing as it is about the different tools available for writing. As such, the study refutes the hyperbolic and deterministic claims about technology and writing, and finds that technology is not leading to new ways of thinking while writing. Instead, surfaces and implements available allow writers to change how they practise their ways of thinking while writing. By considering this distinction and developing understandings of the dynamics involved and their implications, writers may begin to realize the potential of technology for writing. Ultimately, this thesis contributes to existing theories on writing through an informed discussion of how to think about implements and surfaces in ways

that support writerly thinking, and by offering fresh ways to think about the lived practice of writing.

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# Chapter 1: Introduction

*Although even the initial users of technology can often sense the changes in their patterns of attention … the most profound shifts play out more slowly, over several generations … How is the way we write changing? How is the way we think changing? Those are the questions we should be asking, both of ourselves and of our children.*

– Nicholas Carr, *The Shallows*, pp. 199–200

## 1.1 Introduction

*How is the way we write changing?* Carr (2010) raises this question in a two-page, first-person digression, half-way through *The Shallows,* his book on how the internet is restructuring our brains. The digression – on the process of writing the said book – shares how Carr's experience of his own daily, networked life influenced his writing process. After months of experiencing constant interruptions, scattered thoughts, and disconnected text spurts, Carr moved from a Boston suburb to the mountains of Colorado. In the digression's two pages, Carr shares how daily technology altered his behaviour and thought processes in ways that challenged his capacity to compose sophisticated writing. That, however, is obvious. More intriguing is how his ways of thinking were continually shaped by automated interactions with his devices and how he perceived his context. Why could Carr simply not turn off or disconnect his devices? For Carr, mental space – and activity – required both temporal control and actual physical distance.

For writers and writing, this is arguably the most exciting time since Gutenberg (Harnad, 1991). Though his thesis encourages, *ad minimum*, an awareness of the influences of our environments, Carr's provocative question ('How is the way we write changing?') implicates both writers and writing as passive recipients of this change. Writers and writing, by nature, however, are active. Such a view inspires a reorientation of Carr's question. How might writers develop the way they write by using technology? Further, how might we use digital writerly tools in ways that support – and possibly enhance – the thinking involved in writing? This dissertation grows from these curiosities to understand whether and, if so how, thinking while composing, and uses of writing implements and surfaces interrelate. In three sections, this chapter aims to explain the reasons for pursuing this study (*1.2 Research Rationale*), and to elaborate briefly on its focus (*1.3 Focus of the Study*) and content (*1.4 Comments on Content*). The chapter concludes with an overview of this document and the thesis's proposed structure.

## 1.2 Research Rationale

Might we use digital implements and surfaces in ways that support – and possibly develop – the ways of thinking involved in composing written works of semantic cohesion? The focus of this dissertation is driven by this guiding inquiry and the context, practical and theoretical, from which it emerges. Certain features of that landscape are critical to understanding the research questions, their formulation, and investigation that this study sets out to examine.

### 1.2.1 Context: Implications of Writing Abilities and Research

Four contextual points, in particular, ground the reasoning that forms the rationale for this study. First, writing abilities in education and the workplace are persistently poor (National Center for Education Statistics, 2012; Dillon, 2008) despite the increasingly text-based nature of communications via technology (Graham, 2013). Fundamental to addressing this issue is point 2: writing skills must be learned (Dehaene & Cohen, 2011; Fischer, 2003). Support for the learning and teaching of writing reveals a growing interest in using technologies (Graham et al., 2013), while – point 3 – research available to inform this work is limited or out-dated (Laitusis et al., 2012; Kirschenbaum, 2011; Mangen & Velay, 2010). Finally, here is point 4: modern technologies are designed to be intuitive to allow users to concentrate singularly on their desired task without interruption or disruption. Recalling point 1, it is increasingly evident that intuitive use – and integration – does not equate automatically to better, or even consistent, writing outcomes.

For research into the digitization of writing, the crux of the context outlined above is the state of the knowledge base: disparate and incohesive. This may be attributed to a range of reasons. Of relevance to the rationale for this study, particularly its design, is where conceptual gaps and disconnections occur: at the foundational, descriptive level. Theoretical understandings of the cognitive basis of writing, how writing skills develop, and best practices in writing instruction – let alone how writing tools consciously and unconsciously shape the writing process – all remain in development. This suggests that past and current research in these areas, independently and interrelated, draws on conceptually incomplete theoretical perspectives and makes significant assumptions in doing so.

### 1.2.2 Reasoning: Limited Understandings of Theory and Practice

From the landscape outlined above, two lines of thinking persist: while this study will endeavour to explore them as interrelated, for purposes of clarity, they are presented independently here. The first thread traces the current state of critical writing abilities and practice and, as emphasized above, how the issues and questions it raises have been approached by theory and research to date. The second line, which has yet to be discussed in great depth, is fuelled by research into how networked technology use restructures the human brain. Clinical research into long-term potentiation (Centonze et al., 2005) confirms that brain functioning is continually shaped by experience. With regard to technology, experimental evidence (Ophir et al., 2009) suggests that how one interacts with devices qualitatively changes the programming of the underlying cognitive processes – often to the user's surprise. One example is the susceptibility of heavy technology users and consumers to allow stimuli unrelated to the task at hand to divert their attention, unaware of the shifting focus.

Thus, through the context and reasoning outlined above, it becomes evident that the nature of thinking, both purposeful and automated, when writing with digital tools warrants in-depth, qualitative research. The numerous questions for research that arise from this topic, however, cannot all be answered well in one study. To determine which questions this study will pursue, an analytical lens and framework were established. The reasoning behind those conceptual filters constitutes the rationale for this study, as detailed below. The focus that develops from, while drawing upon, this lens and framework is outlined in the subsequent section.

### 1.2.3 Rationale for this Dissertation

Sophisticated writing is a consuming and complex mental activity. It requires executive functions to choreograph effectively and efficiently long-term and working memory resources to translate, to transcribe, and to review written text. Attention and one's faculties for perception also contribute to the processes of writing, as do a range of motor functions. These too are *embodied* through cognition. Research into the haptics of writing, for example, has begun to illuminate how the activity of writers' hands when producing a letter is cognitively based and relates to their thinking while writing. The developmental consequences of this have been raised by research on embodied cognition and the embodiment of writing (Kiefer & Trumpp, 2012) as neuro-imaging data illustrates the distinct motor activities and spatial abilities required when

using a computer to write, versus pen and paper (Ardila, 2004; 2012). While the implications remain uncertain, this research reveals how writing is a mental and physical experience rooted in the mind. This suggests that a writer's mind programmes, executes, and processes all activities – mental and physical – while writing.

The term 'mind', however, can be problematic. Numerous philosophers and scientists have wrestled with defining and explaining what constitutes the mind, independently and in relation to the physical world (e.g. the brain). This dissertation employs the 'term' mind in its natural language sense, while recognizing that even this must acknowledge a working understanding of the continual contributions of different scientific disciplines in refining and enhancing our understanding. While offering different definitions (see, e.g., Pinker, 1997; Siegel, 2012), such views also contribute deeper knowledge of how the mind develops, distinct mental states and their neural underpinnings, and the influence of surroundings on our ways of thinking. Accordingly, throughout this dissertation, the term 'mind' refers to the perceived and embodied realization of the interaction of the brain and culture. This draws on an open understanding posited by neuro-anthropology (Mason, 2009), and a notion of the mind as the instantiation of ongoing activity that involves regulation, awareness, and subjective experience (Siegel, 2012).

From this basis, the writer's mind is the lens through which the focus of this study developed. To elaborate, even material factors such as, for example, the tactile affordances of keyboards and the design of word processors will be analysed for how their affordances are processed and confer meaning to the writing mind. This is not to say that all writerly activities are conscious or that unconscious activity is mindless (Magnifico, 2010) – to the contrary. An extraordinary amount of automated, embodied activity occurs while one writes, informs how one writes, and remains unrecognized by writers, while shaping and being processed through their minds. In *Thinking, Fast and Slow*, Daniel Kahneman notes: 'we can be blind to the obvious, and we are also blind to our blindness' (2011, p. 23). That latter notion captures a key principle in this dissertation's approach to the mind while writing, and to the focus and design of the study itself.

When individuals are unconscious of automated actions and behaviour that underpin the very processes upon which their activities depend, understandings of those processes, whether they are changing, and with what effects will be tenuous. Applied to the digitization of writing, this gives reason for directing the study's focus to developing understandings of such intuitive

processes. Those processes, however, occur within and are shaped by distinct contexts. While relevant, focusing on the meanings attached to uses may fail to capture insights from an analysis, even through interpretations, of activity irrespective of whether the writer considers it meaningful. Returning to the guiding inquiry, this directs the focus to the implements and surfaces through and around which the activity occurs and relevant factors converge.

Ultimately, the guiding inquiry concerns how individual minds might effectively use available tools for a complex cognitive and cultural activity: writing. This neuro-anthropological orientation (Duque et al., 2010) raises the following question: how might explanations of such dynamics that reflect both the brain and its participation in a cultural activity be developed for deeper understandings? Further in line with a neuro-anthropological orientation, this thesis' grounding through the mind of the writer, as discussed, emphasizes the interrelation of the brain and culture. Thus, the rationale for the focus detailed below – its substance and form – is two-fold: 1) to illuminate those deeper understandings and 2) to do so in ways that might contribute interpretive foundational knowledge to advance experimental research into the contextual issues that lead to this study.

## 1.3 Focus of the Study

As has been referenced and will be discussed further throughout this document, writing is a cultural tool and activity. Our human genome is not programmed to develop writing skills; the situated context is critical (Dehaene & Cohen, 2011). For conceptualizing this study's focus and approach, this raises how research into the relationship between individuals' modes of transcription – the writing implement and surface – and the thinking involved in the corresponding writing process necessarily must account for contextual factors. Having defined the study's primary components and relationships, the research questions were refined through the following prompts from neuro-anthropological orientation: what are the integral components and the relationships; what are the processes by which the above components and relationships become practice; and how might these dynamics be characterized and explained to develop understandings? This translates into the following three questions.

1. Are writing implements and surfaces related to ways of thinking while composing, and if so how?
2. Which contextual dimensions influence uses of implements and surfaces?

3. Might writers enhance the writing process through effective and innovative uses of implements and surfaces?

The focus of this dissertation will be guided by these three questions and will evolve according to the principles listed below.

1. The relationships of the brain and writerly tools reflect cultural and cognitive dimensions that are fluid, such that the effects of their interaction are mutually influential, or bi-directional (Duque et al., 2010).
2. Writers' self-reports offer valuable sources of data (Tomlinson, 1984).
3. Interpretive, ethnographic knowledge generates insights into how cognitive function and expression relates to cultural activities (Duque et al., 2010).
4. Writerly use of implements and surfaces is a function of the writing process to which it contributes. Any qualitative judgements on the writerly use of implements and surfaces, therefore, will be made with reference to the writing process.

## 1.4 Comments on Content

The study's focus on how implements and surfaces relate to the activity and cognition of writing, a socio-cultural activity, incorporates elements that span a range of disciplines. Thus this research, including the review of literature, will draw on diverse theories, often from fields outside education. Any and all writing on the study, including this document, however, will be composed for an audience of equally diverse backgrounds and interests – much as writers are. Terms and concepts are defined throughout this document. At this stage, however, one term in particular warrants clarification, and that is 'writerly'.

First used by Roland Barthes (1973), the word 'writerly' continues to be employed throughout literary studies to establish an association with writers and writing. 'Writerly' engages a sense of participation within the world of writing, thus binding the modified noun to the practices and norms of writing. Throughout this study, 'writerly' is frequently used to establish such connections to notions of writing and being a writer. The concept of writerly uses of technology, for example, delimits the 'uses' to those that are constitutive of the writing process as understood and experienced by writers.

### *Earlier research*

This study draws and builds upon work that I completed for a dissertation for an MSc in Learning and Technology: 'Writerly uses of technology: a study of the explanations and rationales of five professional writers' (the 'MSc research'). While not a pilot for this study, the MSc research continues – and will continue – to inform the thoughts and thinking behind this dissertation. An overview of the study is presented below, according to particularly relevant lessons gained from collecting and analysing the data.

The data collection for the MSc study involved in-depth interviews with five professional writers: three professors and two journalists, who all have written non-fiction texts of critical acclaim. Each interview was conducted in the individual's writing space and lasted roughly an hour – except that with the journalists, who were interviewed together for roughly two hours. Transcripts of voice-recordings and observations from each session were created and then reduced to discuss the following three questions.

1. How do writers' personal uses of technology throughout the writing process relate to their natural writerly abilities?
2. How do writers' personal uses of technology throughout the writing process relate to the practices and processes of writing?
3. When and why is technology not used throughout the writing process?

Even reduced, the transcripts offered an abundance of insightful, nuanced comments and provocative contextual depth through which to deepen the analysis and to discuss the research questions. Thus, conducting unstructured, hour-long in-depth interviews proved to be an effective data collection method within the context of the MSc research.

When commencing the data analysis, initial interpretations and connections to existing literature, including how the literature was able to illuminate the data, rendered discourse analysis and coding techniques inadequate. Instead, the analysis was guided by rigorous tactics for generating and testing meaning (Miles & Huberman, 1994). This allowed for the development of the complex understandings that had been sought, though it did highlight the potential of a thematic and referential coding scheme developed through further research and theoretical modelling. The study found that uses of technology for writing were personal, and when purposeful contributed to the thinking involved in the writing process. Insights and lessons from the MSc research are referenced throughout this document and reflected in the

conceptualization of this study. As noted, however, this study seeks to examine and to answer an entirely separate set of questions.

## 1.5 Document Structure

This thesis proceeds by documenting and explaining the reasoning, design, implementation, and findings of the study. An overview of the chapters is presented here. Chapter 2 grounds the study through a review of existing literature. After clarifying the key terminology, the chapter engages relevant areas of research, namely the history of writing, learning sciences, composition studies, and human–computer interaction**.** Chapter 3 states the aims of the research and introduces the research questions. Chapter 4 details the research methodology and study design for both stages of the study. Chapter 5 presents the findings from stage 1 of the study. The findings from stage 2 of the study comprise Chapter 6. Chapter 7 discusses the findings collectively and proposes how writerly tool use might support the scope of ways of thinking while writing. The thesis concludes with Chapter 8, which considers how the findings lead to new ways of thinking about writerly tool use and the lived experience of writing.

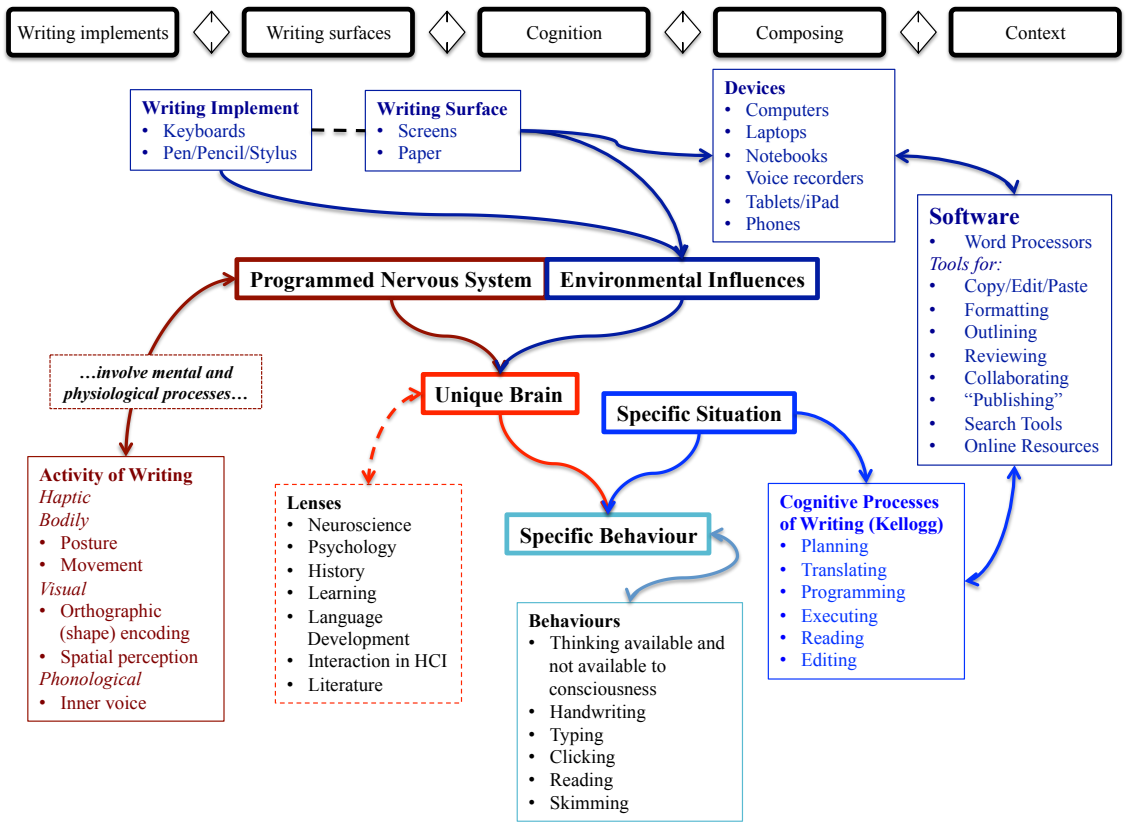
# Chapter 2: Literature Review

A wide range of published research and other relevant literature was reviewed to refine the construction and understandings of the following two questions that guide the focus of this study (as outlined in Section 1.3).

1. How are writing implements and surfaces related to ways of thinking while composing?
2. Which contextual dimensions influence uses of implements and surfaces?

Directing the review is a word map of terms (Figure 2.1) that began as an abstraction of questions 1 and 2 above, and evolved with and to track this process. As conveyed by the word map,

**Figure 2.1. Word map guiding the review of literature**




'environmental' is used throughout this study to refer to that which relates to or arises within one's surroundings. The comprehensiveness of the development and application of the word map

is aided by its organization and by the engagement of relevant research across diverse disciplines and topics, including history, psychology and learning of writing, human–computer interaction, and socio-cultural influences. Earlier research also has contributed to this process.

Question 3 posed in Section 1.3[1] has not been addressed directly by the literature review owing to its underpinning assumption that how a writer uses implements and surfaces may enhance the writing process. Nonetheless, research evaluating distinct writing formats (handwriting versus typing) does begin to address whether differences between uses result in different writing experiences and, if so, how. That research, however, primarily responds to question 1 above. Thus, focusing on questions 1 and 2 throughout the literature review and the field research will aim to clarify understandings of the dynamics upon which this key issue rests: how writerly tool use relates to the writing process. Such research is critical for an informed discussion of whether and, if so, how those understandings might enhance such a process, as raised by question 3. Accordingly, in four sections, this chapter will present the literature that informs the architecture of this study and guides its pursuit.

To ground the subsequent sections, Section 2.1 explains how the concepts of writing, surfaces, and implements are understood by this study. With the terminology and key concepts established, the second section turns to writers' surroundings, applying questions 1 and 2, above, to discuss the literature and research on environmental influences. Specifically, the section considers this question: 'What have been the key environmental influences for writerly tool use and relevant contextual factors, and how have they shaped the writerly process?' Section 2.3 then reviews the literature on understandings of how surfaces and implements relate to expert writerly ways of thinking while composing through the lens of the embodied experience. Viewing experience – the constituent situations and behaviours – as embodied acknowledges the role of individual capacities for thinking, as well as acting and perceiving. Building upon the structure and substance of Sections 2.2 and 2.3, the concluding section integrates both the contextual and individual lenses to review the contemporary situation.

## 2.1 Writing, Surfaces, and Implements: Defined

This study is primarily interested in writing as thinking, as opposed to writing for communicating or recording thinking. Focusing on writing as thinking emphasizes the content,

[1] Question 3 asks: 'How might writers enhance the writing process through effective and innovative uses of implements and surfaces?'

process, and product of thought that involves, contributes to, and results in visible language. Within this view, thinking is understood to include the mind's purposeful and automatic orchestration of mental, perceptual, and physical activity. Fundamental to this writing process is the translation of thought, in whatever form, into written text, for which one needs surfaces and implements. These four concepts – writing as thinking, the writing process, surfaces, and implements – ground the foundation of this study and thus this literature review. Before reviewing relevant theories and research, the following two sections present what is meant, first, by 'writing as thinking' and, second, by the writing process, surfaces, and implements – and why this specific terminology is used.

### 2.1.1 Writing as Thinking

For decades, composition research and psychological theories have studied and explained writing as an activity of the mind, examining both cognitive processes and cognitive activities. Writing instruction also has contributed explanations of writing as a mental activity through notions of learning to write and writing to learn. Formative cognitive models of writing conceptualize the mind's activity as relying heavily on a concept called working memory (Flower & Hayes, 1981; Kellogg, 1994; Berninger, 2012), which coordinates and organizes the mental processes that constitute the components of the writing process (e.g. planning, translating, and editing). The aspiration, in these cognitive models, of expert writing is distinguished by the abilities to constitute knowledge spontaneously (Galbraith, 2009) and to transform knowledge by accounting for goals or expectations of the text (Bereiter & Scardamalia, 1987). However, these models[2] neglect the influence of physical, sensory, and contextual factors in the act of writing (Mangen, 2013), notwithstanding fundamental questions raised by neuroscience (Purcell, Napoliello, & Eden, 2011) and rhetorical theory (Fahnestock, 2005) – such as how the brain processes language and how motor activity interrelates with thinking. The abstraction of and emphasis on cognitive processes and mind-based concepts (e.g. working memory) fail to explain, independently or collectively, what writing as thinking is and how to develop it.

Insights into how to develop writing as thinking may be traced to the development of Writing Across the Curriculum (WAC) in the 1970s. WAC grew as an instructional approach

[2] Section 2.3 returns to these models, despite their limitations as explanations for writing as thinking, owing to their contributions to understandings of the experience of writing.

across universities and subsequently has garnered interest among K12 educators (Russell, 2002). Its pedagogical focus has been distinguished by two philosophies of writing (McLeod, 1987):

1. writing for learning (Britton, 1975; Emig, 1977);
2. learning to write.

The centrality of learning within WAC implicitly locates thinking within its approach to the development of writing. An explicit definition of writing as thinking, however, remains elusive. Further, writing for learning neglects to explain the activity of the writing process that does not serve or occur within learning contexts – that of the professional writer, for example. While advances in brain-imaging technology and its use to study the brain basis of writing have led researchers to view writing as the interaction of distinct internal and external systems (Berninger & Winn, 2006), understandings of the internal system continue to emphasize the mind-brain and exclude the motor-sensory systems. Without an explicit definition of writing as thinking, let alone clear goals, related programmes and instruction are simply that: related without conceptual cohesion and progression. Compounding such ambiguities are the tenuous explanations and notions of learning at the foundation of WAC. Despite their promising orientation and recognition of the 'enactive hand' (Emig, 1977), the philosophies underpinning WAC constrain writing as a curricular and social practice.

Ultimately, writing as thinking seeks to capture what distinguishes the thinking that occurs while writing. Moving beyond the classroom, the research of Menary (2007) and Oatley and Djikic (2008) offers ideas for a comprehensive explanation of writing as thinking. Menary. and Oatley and Djikic, conclude that writing as thinking is distinguished by revision practices – the external manipulation of text. Both studies view revision as thinking that *depends on* the visualization of and the motor-sensory capacities for modifying written text. The writing surface and the physical act of writing underpin the notion of revision. By examining writing outside of instructional or any specialized contexts, this research zooms into the lived experience of writing and what renders it unique in comparison to other thought-based activities. Attending to that complete lived experience, including the individual and tools involved, this understanding of revision offers a base from which to conceptualize and to apply writing as thinking within research.

From this grounding, the linguistic view of internal cohesion[3] (Halliday & Hasan, 1976; Pinker, 2014) and notions of knowledge constituting (Galbraith, 2009) and knowledge transforming writing (Bereiter & Scardamalia, 1987; Kellogg, 1994) from composition research, scaffold this study's expectations of writing as thinking. Thus, through text generation and revision, writing as thinking engages capacities for constituting and transforming knowledge to compose a written text that demonstrates internal cohesion. One such capacity involves the shifting of mental attention between what the written text in process actually says and its intended reception – what the writer wants the text to say. Accordingly, this study holds that writing as thinking is distinguished by processes of spontaneous text generation and of internal and external revision – with both sets integrating implicit and explicit knowledge of writing and the given topic to produce a piece of internal cohesion. According to this view, writing quality becomes a function of the thinking involved in the composition of the text.

Resting on natural and conscious mental activity realized through the literal processes of transcription and reading, this view of writing as thinking acknowledges the integrative role of physical and perceptual activity. Thus, embedded in the ideas that distinguish this study's view of writing as thinking is a particular understanding of thinking while writing and recognition of influential factors. A criticism at this point may be that the offered view of writing as thinking simply is the complete lived experience of composing an internally cohesive text and thus too broad in scope. Writing as thinking, however, accurately and inclusively captures what it means to write and what distinguishes the practice. Thus, criticisms of scope would fail to acknowledge that prior theories have been deficient in their narrow and misguided emphases. Writing as thinking applies a lens to the lived experience of composing that accurately distils what uniquely constitutes writing: writerly ways of thinking.

### 2.1.2 The Writing Process, Surfaces, and Implements

Writing as thinking explains the nature of what occurs during the period of time necessary to compose a piece of internal cohesion. Throughout this study, that period of time is referred to as 'the writing process'. Traditionally, the writing process is understood as the collective, theoretical 'writing processes' (e.g. planning, researching, and revising), distinguished by existing composition models. This study adopts a view which – in line with the notion of writing

[3]See Section 2.4 for recent literature on cohesion and writing quality.

as thinking – acknowledges that the structure and sequence of those processes may vary considerably in practice. The terms explored below, developed and used in composition research and writing instruction, facilitate discussions of what occurs while writing by establishing common understandings in conversation. The application of writing as thinking, however, raises the question of how the uses of writing process terms to refer to writing in practice should be clarified to confirm that the intended use is in agreement with the conceptual understanding. Here, writers' individual or personal processes would be more accurately referred to as 'writing practices'.

Within writing research, writing practices have been studied to identify effective strategies and techniques for instructional purposes. A recent meta-analysis of research into such elements builds upon and incorporates prior meta-analyses, and focuses on research into writing instruction that emphasized either learning to write and/or writing to learn (Graham & Perin, 2007). However, aligned with the philosophies applied – the same approaches underpinning WAC – only studies of student populations were considered. Within existing research, expert writing and thus the writing practices of expert writers continue to remain detached from instructional enquiries. Thus, this study uses its own understanding of writing practices: 'writing practices' are the individual ways in which people orchestrates their thinking and writing tools to produce written text, which – in sum – constitute their personal writing process.

The physical act of writing involves the transcription of language onto a surface via a writing implement (e.g. paper and a pencil). As will be discussed below, throughout history different objects and materials have been used as writing implements and surfaces with distinct implications. This study will focus on two surfaces in particular: paper and screens. Any unspecified use of 'writing surface' will refer to that upon which text has been or is transcribed. While this may seem constraining, the understanding of paper as a writing surface extends to any forms in which paper exists; these include both notebooks and diaries, for example, which contain paper pages. Paper and screens have unique and shared properties that hold different implications within different writing processes. As discussed, the writing surface – whether blank or marked – is integral to the enactment of writing as thinking. Additional research and literature on writing surfaces will be introduced throughout the subsequent sections.

The term 'writing implement' is used broadly throughout this study to indicate tools that capture and are used to make prose visual. This includes, though is not limited to, pencils, pens,

and keyboards. Earlier research indicates that audio-recording devices and dictation software also are used to capture prose. Though developments in dictation software programmes claim to turn voice to text, their inaccuracy remains a source of humour. Of greater relevance to this study though is the fact that dictating does not necessitate haptic activity. This further refines this study's understanding of implement as requiring continuous motor engagement to render the prose visual. Accordingly, this study does not view audio-recording devices or dictation software as implements. Nonetheless, such devices and programmes may be used in ways that illuminate those of implements and surfaces, and corresponding instances will be considered.

Having outlined the key concepts underpinning this study, its approach to writing and writing tools, the remaining sections examine ways of thinking while writing and uses of surfaces and implements by reviewing existing literature on environmental factors, the individual experience, and the contemporary situation. Thus, the following section will discuss cultural, social, and technical influences on writing practices. The section applies these distinct angles to understand what has shaped the way individuals write and how, since the origins of written language.

## 2.2 Writerly Tool Use: an Environmental Lens

As a cultural development, writing is a skill that must be learned and one that is continually formed by its surroundings – what and who is present and how those factors interrelate and interact with the individual writer. Not only does the development of writing skills depend on the context in which one grows up, but the personal benefits of literacy are determined by how one develops and continues to practise those skills (Scribner & Cole, 1981). How one learns and practises writing is shaped by cultural, social, and technological factors, *inter alia*. Examples of such factors particularly relevant to this study include understandings of the processes, purposes, and functions of writing and written texts; who writes and to whom; and how writing tools are designed, perceived, and used. Which and how environmental factors have influenced how writing implements and surfaces have been developed and used for sophisticated writing will be the focus of this section of the literature review. Within this context, factors are considered influential if affecting one or more of the constituent dimensions – writers, writing surfaces and implements, and use – in ways that shape and have been shaped by sophisticated writing. Owing to spatial limitations, however, this section simply cannot present all relevant, environmental influences from the dawn of written language. Thus, in three subsections, examples throughout

the history of writing until the contemporary period will illustrate the key factors and trends. These examples are not the only influences but seek to convey how cultural, social, and technical aspects have shaped the use of surfaces and implements, with implications for writerly thinking.

To distinguish between cultural and social factors, this review adopts Labov's (2010) distinction of the former according to their broadness and distance from interpersonal communications. However, the majority of points made throughout the three sections discuss writing practices that are culturally determined and practised by social beings, and incorporate surfaces or implements that are inherently technical. The nature of the topic renders the lines between the delineated categorizations quite blurry. Thus, what makes one factor cultural versus, say, social is the nature of what specifically shaped the influenced writing practice or tool. Who initially used typewriters in the office illustrates an influence of workplace culture, *inter alia*, while the keyboard layout is a technical factor that leads to a distinct, bi-manual haptic activity. Examining research and literature regarding relevant environmental factors will illuminate the discussion of the individual writerly experience in Section 2.3.

### 2.2.1 Cultural Factors

As noted, writing is a cultural phenomenon rooted in the advance and growth of civilizations. Cultures have shaped and continue to be shaped by what purpose writing serves, how the practice and outcome – texts – are regarded, who writes, what is written, how writing is taught, and which writing materials are used for which purposes and how (Ong, 2012). Diverse contexts, beliefs and attitudes, language properties, and social structures have influenced written language from its beginnings. The study of early writing holds that distinct written language systems were developed in four cultures: Mesopotamia, Egypt, China, and Mesoamerica (Woods, 2010). Though researchers dispute whether complete writing[4] originated independently in the aforementioned locations (Woods, 2010) or evolved as cultures integrated influences from each other (Fischer, 2003), the content and, as will be discussed later, materials of early writing within each culture varied and evolved on different timelines.

Early cuneiform texts from Mesopotamia record employment, financial, and real estate transactions – and proliferate with the growing complexity of the society. There, maintaining a written record served a utilitarian purpose. Recent analyses of early Egyptian transcriptions –

[4] Here we adopt a definition of writing that includes all graphic forms which are used to convey information (Harris, 1989; Olson, 1995).

labels on jars and ivory tags – offer further evidence for a utilitarian view of the origins of writing, and dispute theories of ceremonial beginnings in that region. By contrast, archaeological findings in China and Mesoamerica suggest early writing tools were used for religious or ceremonial purposes. Further, in both regions, local socio-political complexity advanced prior to, not with, the earliest written texts found. Nevertheless, archaeologists (Postgate et al., 1995) caution researchers about citing the abundance of early ceremonial writings and the relative absence of utilitarian text as definitive evidence for religion being the initial driver of writing systems in China and Mesoamerica.[5] Our understandings of why and how early writing was practised continue to be shaped only by what has been found.[6] Regardless of that, we know that over roughly three thousand years surfaces and implements were used to transcribe varied written content around the world. While complicating explanations, such substantive diversity affirms that culture shaped *why* humans began to externalize language in written form, what they were thinking as they did, and what purposes writing served.

Tracing the evolution of writerly tool use from its diverse origins through to contemporary times reveals how culture has continued to inform components integral to writers, their surfaces and implements, and the resulting interactions to compose texts. Key forces include the practice and development of written language systems (Dunn et al., 2011), the functions of written texts (Robinson, 2008), and who learned to write and how (Nystrand, 2006). Turning to written language systems, advances to alphabetic systems, for example, bore features that became integral to how one thought while writing – as evidenced by their preservation in contemporary alphabets (e.g. the English alphabets). Symbols – or orthography – became standardized for that system, scribes began uniformly writing from left to right, and changes to the phonetic properties of alphabets reduced the load for the working memory (Fischer, 2003). Here the point merely is that alphabets began to feature phonetic properties, which continue to shape thinking while writing. Debates surrounding the invention of the phoneme principle, and particularly whether it was that of the Greeks, however, do have implications for enquiries into how writing restructures thought. Harris (1989) argues that advancing the phonetic alphabet – the

[5] Within this view, the survival or preservation of texts also should be considered. The durability of different surfaces, for example, renders certain texts more likely to survive than others composed on more perishable materials. These dynamics will be explored further as technical factors.

[6] The recent discovery of cave paintings that are at least 40,000 years old in Indonesia (Aubert et al., 2014) illustrates how archaeological findings continue to re-frame understandings of how human intelligence and the early visualization of ideas.

first, complete alphabet – as the unique contribution of the Greeks, as Havelock (1986) does, aligns with romantic views and renders enquiries into how writing restructures thought well nigh impossible.[7] Instead, Harris suggests that a pluralist view allows us to understand the role of literacy in Greek thought (from Homeric patterns to Socratic strategies) by acknowledging the political factor. Even Plato, who once disputed the value of writing, comes to favour its use for laws and their treatment as 'unsponsored language' (Harris, 1989). This demonstrates how culture underpins both literally how and explanations for how writing restructures thought.

Efficiencies and enhancements, such as standardizing text direction and phonetic properties, supported the adoption and proliferation of writing systems throughout the Middle Ages. Written language began to be used to document abstract thoughts in precise ways (Kellogg, 2013). The distinct properties of different cultures' written language systems, however, continued to shape their transcription. In comparison to the small handwriting of English texts from the twelfth century, the paucity of abbreviated forms in French texts of the same period, for example, illustrates the influence of orthography on handwriting: the scripts one transcribed and how (Parkes, 2008). Even so, psychologists (Kellogg, 2013) and media theorists (Ong, 2012) agree that early writing introduced new processes and ways for humans to think, with implications that extended beyond documentation and communication and into cultural consciousness (Havelock, 1986).

Offering a nuanced analysis of the evolution of writerly thinking, Ong (2012) explains how the generation and construction of one's ideas and arguments while writing literary and lengthy compositions became customary 'at different times in different cultures' (p. 94). He notes that this fluctuation may be illuminated, in part, by the varied times at which writing materials were developed and became accessible in different cultures. Paper, for example, was manufactured in China as early as the second century BC but not in Europe until the twelfth century AD. Throughout many cultures, however, dictation and the employment of scribes endured owing to lasting oral practices of developing thoughts aloud and the onerous nature of writing tools (Ong, 2012). That writing tools presented obstacles to composing is understandable; what is striking here is the response, or solution: the continuation of the oral tradition, with the 'writer' still creating and externalizing in spoken form. This raises the

[7] Section 2.3.1 outlines Harris's argument on how writing restructures thought.

question of whether there are aspects of spoken language that might be incorporated positively within the composing process.

With the spread of penmanship and its integration within education in nineteenth-century America, the influence of cultural norms and class structures on the use of writing tools becomes increasingly apparent. Prior to the mid-eighteenth century in the United States, writing was primarily practised by calligraphers and artists (Eaton, 1985). With changing printing and literacy practices in the 1750s, handwriting began to be adopted as a craft. Different scripts were codified and detailed in manuals that one could purchase. During the nineteenth century, penmanship styles spread throughout the United States with their popularity ultimately driven by transcription speed (Eaton, 1985). The increasingly industrialized and commercialized culture wanted and needed to be able to write as fast as possible. Tools and scripts were valued for their speed. Focusing on penmanship skills, education adopted a similar interest in the formal aspects of writing.

Until the end of the nineteenth century, formal education's view of writing reflected the cultural norm. Writing was subservient to speaking; it served to make speech visual (Miller, 1989). This echoes the continuation of dictation in the twelfth century, which is reinforced by what occurred in practice: being taught to write essentially entailed learning handwriting skills in elementary school, with no further instruction. Beyond elementary years, those for whom writing would have been necessary would have practised it frequently owing to the daily oral norms of the upper class at that time (Miller, 1989). Like the enduring practices of dictation, this suggests that the unique benefits of composing for thinking, and the requisite, accretive knowledge, had yet to be translated into pedagogy. The lack of writing instruction in secondary school rendered composing a skill for the upper class. In the 1870s, however, a revolution of new uses for text communications – driven by jobs and technologies – embedded writing within a range of unfamiliar social practices (Russell, 2002), as will be elaborated upon in the subsequent sections.

Despite such growth and specialization characterizing who was writing, and their reasons and audiences when doing so, educators continued to view and to instruct writing as if it were a mode of speaking for a single audience – occurring within a fixed community of constant roles, expectations, and discourses. Those misconceptions prevented writing instruction from evolving, let alone preparing students adequately; meanwhile the purposes and structures of educational communities continued to develop and literacies multiplied (Russell, 2002). Within education,

institutionalized norms based on anachronistic cultural views overrode social realities. Not until the Dartmouth Seminar[8] in 1966 did educators' conceptions of writing, its development, and instruction begin to evolve (Nystrand, 2006). In recent times, writing research has increasingly focused on the influence of writers' cultures with particular attention to student populations (Ball, 2006). That research explores how to teach to students of diverse cultural backgrounds, and reveals the influential role of the culture of students' homes and out-of-school contexts, writing work habits and values, teachers' cultures and instructional contexts, and school and classroom characteristics.

At present, educational bodies are working to strengthen standards, and competition to enter and within both higher education and the publishing industry continue to intensify. During such times of demographic and economic changes as the present, the state of literacy historically becomes a growing concern (Nystrand, 2006). Such changes alter the context within which literacy is practised and the standards to which it is held, and the resulting concern leads to efforts that seek to redefine the standards and expectations of writing practices, primarily within formal education. These have a ripple effect from national bodies through to states, districts, schools, and classrooms. A full analysis is beyond the scope of this chapter, but it is evident that standards and assessments strongly influence how students learn and practise writing.

### 2.2.2 Social Factors

Social contexts shape the development and practice of writing (Sperling, 1996) and whether and how writing impacts ways of thinking (Scribner & Cole, 1981; MacArthur, 2006). How one learns to write, for example, is influenced by the quality of the relationship between a learner and instructor, their respective literacy beliefs, reoccurring writing practices, and past experiences (Kucer & Silva, 2013); the continued practice of writing beyond instruction then continues to be shaped by the identity of who is writing and to, or for, whom. Thus, social factors influence and are expressed by the ways in which one writes. This section discusses social factors – viewed as such owing to their direct relationship to interpersonal communications (Labov, 2010) – that have directly shaped uses of surfaces and implements. Drawing on recent studies and theories,

[8] The Dartmouth Seminar is considered the first instance when composition theory and pedagogy - the discipline itself – were collectively examined by English educators from the US and UK. The Seminar sought to develop common definitions and to identify effective teaching practices (Nystrand, 2006).

this section specifically considers how issues concerning community, audience, and identity shape uses of surfaces and implements with implications for composing.

As alluded to above, writing is woven into and moulded by the communities within which it is performed. Such dynamics have informed and sculpted the purposes and practices of writing since the development of the earliest writing systems. With the proliferation of text-based communications across increasingly complex societies, offline and online, the communities within and for which one writes continue to evolve; how they shape sophisticated writing practices are also in flux (Englert et al., 2006). Across diverse sectors – education, publishing, research, *inter alia* – communities have their own interests, guiding principles, and aims that influence how writing is practised, understood, and taught. Writing research, for example, traditionally has sought to understand first the nature of writing to inform writing instruction (Nystrand, 2006). Writing for a specific discipline and research on school-wide laptop programmes highlight factors that shape how community and writerly tool use interrelate. These lenses reveal how, in addition to their interests and aims, a writer's communities offer norms, activities, and relationships through which to practise and to explore writerly ways of thinking, and uses of surfaces and implements.

Writing and learning to write for a specific discipline requires acute understandings of the community for and within which one is writing (Englert et al., 2006). Across academic subjects, writing conventions differ, each with different types of writing and their own objectives, tone, style, and ways of citing and referencing (Purdue OWL, 2014). Individual subjects offer constructs for writers within that community and bases for collective engagement and discussion. Literature on the rise and influence of the Master of Fine Arts (MFA) degree in creative writing, for example, reveals how the integral structure, the writing workshop, generates formative knowledge sharing and construction through the social relationships constructed by the established writing community (McGurl, 2011). Communities guide the development and construction of writerly ways of thinking and, in turn, their evaluation. Williams (1991) argues that contextual variation renders distinctions such as expert (and novice) a function of the field within which one is writing.

From research into ten school-wide one-to-one laptop programmes (i.e. each student has access to a laptop with internet connection), Warschauer (2006; 2008) documents a range of ways in which schools, as communities shape the use of writerly tools through, in this instance,

formalized educational initiatives. For one, the communities facilitated access to writing devices and encouraged and supported regular use of the devices for the writing process. Research into socio-cultural approaches to writing instruction (Mercer, 2002) illuminates how such initiatives to promote using computers for writing within a cohesive community encourages active participation within that writing community's continuous practices. This fosters the learning and practising of many critical thinking skills and discourses essential to developing ideas and texts – as well as the collaborative exploration of new features or applications. As well as pedagogical factors and implications, Warschauer raises the role of management and capacity in the implementation of such laptop programmes; administrations and their leadership along with available professional development and IT support all play a role. Thus, within schools, factors shaping writerly tool use extend beyond the classroom, reinforcing the iterative influence of students' surrounding communities.

In addition to community issues, those of the audience – the reader or those who may read the text – shape how one thinks while composing. In the 1870s, the use of text-based communications to substitute for spoken language or face-to-face communication was not common (Miller, 1989). Composing then was practised for unique purposes and contexts: to communicate to particular audiences content that might only ever exist in written form. In the workplace, those audiences were united by an activity or goal – organizational culture – not personal characteristics. Not until the increasingly social nature of writing research in the 1980s did issues of audience come to the forefront (Nystrand, 2006). Questions of audience orient writing as a rhetorical act, as communication, when composition researchers either had viewed text production as autonomous (Emig, 1977) or had relegated audience to the task environment (Flower & Hayes, 1981). Recent research with student writers (Beach & Friedrich, 2006) highlights how understandings of audience shape both the production and reception of one's text, influencing which information is incorporated, and how points and arguments are framed and articulated. When writing for digital realms, one must often construct one's audience – and determine how it shapes the message, substance, and intended appeal of the text being composed (Ferdig & Pytash, 2014).

In addition to community and audience, the identity – or identities (Ivanic, 1998) – of a writer presents another social factor to consider. On a conceptual level, different writing models depict the general writer in different ways (Nystrand, 2006) that shape understandings of their

role in the construction and representation of ideas in written language. An individual's identity as a member of a certain social group or profession, as explained above, may also shape the writing skills that they possess. The mass production of typewriters in the 1870s (Mares, 1909), for example, coincided with the changing face of who was writing. For the first time in history, text communications were being composed daily by the masses. In the workplace, however, the use of typewriters called for motor skills that had not been learned in elementary school. The following section will turn to the technical elements of writing tools to consider their role in the intimate interaction between writers' ways of thinking and uses of surfaces and implements.

### 2.2.3 Technical Factors

As explained in the prior two sections, changes to situated and immediate contexts have continued to influence and be influenced by what one writes (Barton et al., 2000; Baynham, 1995; Gee, 2012), and also shape one's engagement of their capacities and materials for writing (MacArthur, 2006). Within those contexts, concurrent changes to the design and material of surfaces and implements have altered the physical practice of writing, accessibility to writing materials, and durability of the written text. Literature and research into the design, engineering, and usability of writing tools offers insights into how these factors and material elements have informed the development and use of surfaces and implements. In addition to highlighting the role of material properties, this literature reveals how the design principles behind a tool and its features guide but do not fully determine or predict its use; changes to writerly tools are adopted within existing frames of reference. Further, priorities and objectives shaping the design and manufacturing of a given writerly tool do not always reflect the interests and goals of all writers.

For centuries, writing was done on a variety of surfaces: stone, leaves, bark, linen, clay, walls, wood, and animal skins (Fischer, 2003). Since the earliest days of iconographic transcription, different materials have been used because of their distinct affordances, for different purposes and with different implications. As noted, certain materials have survived better than others – whether because of the substance itself or the surrounding climate. In Egypt, for example, typically delicate materials have been preserved by the dryness of certain areas. This explains why understandings of early writing systems must take account of the material durability of early writing surfaces – and the ink used – when making claims of functionality and utility (Postgate et al., 1995). Factors that have shaped which surfaces survived inform understandings of when and why certain materials were used. Scholars find that early scribes, in

general, transcribed utilitarian texts on perishable surfaces and formal or ceremonial inscriptions on enduring materials; the value of the substance and its convenience of use also were considered when selecting a surface.

By making a transition from the papyrus roll to the codex in the second century AD (Reynolds & Wilson, 1974), writers were able to shape their readers' perception of the text (Robinson, 2008). Such format changes allowed for the encouragement of different reading experiences: segmented and non-linear versus continuous, for example. Rolls or scrolls, however, continued to be used owing to their portability – they were easier to grasp. As palaeologists, codicologists, and bibliographers (Parkes & Watson, 1978; Reynolds & Wilson, 1974) emphasize, writing materials continued to inform the production of a written text in medieval times, with different materials, surface sizes, and bindings used for different written texts. Differences between 'book hand' and informal writing, requiring distinct implements, offer further evidence for how ways of thinking while writing shaped the use of writing implements and surfaces.

Towards the late nineteenth century, writing was playing an increasingly central role in society Discussing factors that shaped the role of writing in the wider culture, Russell (2002) offers an explanation, attributing the growth to innovations in print technology in the 1870s, yet without questioning the implications. Proposing why print technology did not spur enquiry into its implications for writing at the time, Mares (1909) notes that the typewriter was merely introduced as a substitute for the pen. Though Russell correlates changes in the presence and use of writing with writing technology, whether keyboards – requiring distinct motor skills by design – had changed how people were writing is not considered. Mares, however, does suggest that typing was a distinct experience that generated a distinct outcome. He explains:

> Instead of holding the stylus as of old, the literary piano was to be played, and the tune it was to turn out was to be the typewritten document. But behold! This is now but the most elementary part of the art … The surprising power of the typewriter is, that it tends to create new work (Mares, 1909, p. 12).

Such insights into the distinct physical experience of composing on a keyboard, however, remained anecdotal observations. Mares illustrates how the unique benefits of given writerly tools are often left to be discovered by individual writers – and not necessarily intended by the hardware designers. The pen offers another example of an implement designed according to

specific objectives that neglected the holistic experience of writing, and where the suggested way of using was not the only way.

At the turn of the twentieth century, advances in pen design (Maginnis, 1906) sought: to prevent writer's cramp, to minimize the size, to enhance the durability of the utensil, and to ensure an even and reliable ink flow as well as the quality and availability of the ink which may be used. While attention to writer's cramp acknowledges the physicality of writing, the association does not extend to implications for the range of activities involved in writing. Nonetheless, the holding – or grasp – of a utensil has continued to attract interest, particularly among educators who have prescribed a single technique. Yet research on the influence of pencil grip (Schwellnus et al., 2012; Dennis & Swinth, 2001) increasingly finds that grasp pattern does not affect the speed or legibility of writing among typically developing students. Though delving into the relationship between fine motor skills and text production, these findings illustrate that the design of a utensil may not be the most beneficial way, and how writers are instructed to use it may not be the most effective method. Provided language abilities are accurate, the physical act of transcription appears to be guided by other factors.

## 2.3 Writerly Tool Use: the Lived Experience

Individuals learn and continue to use writing implements and surfaces by interpreting and integrating their writerly and material contexts through their faculties of comprehending: experience structurally shapes our biology (Centonze et al., 2005; Kandel, 1999). While influenced by cultural history, social experiences, and technical artefacts – as discussed – the faculties for developing and practising written language skills are grounded in and acquire their structure from our biology (Varela et al., 1991). Which writerly experiences a person participates in (Anderson, 2010) and processes (Gleitman et al., 2000) through implements and surfaces is governed by individual biological and cognitive features. Having reviewed environmental factors that influence ways of thinking while writing, and the surfaces and implements used, this section now unravels the situated view of writing as thinking, as introduced in Section 2.1.1, with reference to the use of writing surfaces and implements.

Thus, this section turns to the intimate, lived experience of using writerly tools. Here literature on the mental and physical writing experience, along with the phenomenology of writing, will be presented with reference to the use of writerly tools. By writing experience, this section specifically refers to that of sophisticated writing. Writing, however, is accretive and

therefore even its advanced practice entails basic elements. Accordingly, research into the development or learning of writing is referenced throughout the following three subsections, but only to illuminate the interrelationship between writerly ways of thinking and uses of surfaces and implements. In the three subsections that follow, the lived experience of sophisticated writerly tool use is discussed through the following lenses: the ways of thinking involved, the role of physical activity and perception, and how it is experienced.

### 2.3.1 Ways of Thinking while Writing with Reference to Writerly Tool Use

From a typical developmental perspective and evolutionary view, language is heard and spoken before it is read and written[9] (Fahnestock, 2005). Kellogg (2013) traces the origin of written language – of using graphic symbols to convey information – through the evolution of mental capacities to the convergence of key cognitive developments:

1. abilities for language and of making intuitive, causal inferences;
2. humans' long-term, episodic memory.

Research indicates that the brain evolved to process written language from those capacities by developing new, supplementary mental schema from existing areas (Dehaene & Cohen, 2007; 2011; Kellogg, 2013). Section 2.3.2 will elaborate on how those existing areas and the processes to which they contribute,[10] interestingly, involve both fine and gross motor activity and perception. This section, however, reflects the review of research and literature on cognitive processes involved in advanced composing with reference to uses of surfaces and implements.

Writing entails an array of cognitive capacities – attention, language, memory, perception, thinking; and processes – considering audience, setting goals, organizing with regards to content and rhetoric, clearly translating, evaluating, and revising. Owing to the inherent nature of writing (Deane et al., 2008) research into cognition while writing spans multiple disciplines. From literature on writing cognition, this section specifically discusses the following bodies of research: brain research on the processes of composing, cognitive process models from composition research, and theoretical work on the relationship between writing and

[9] This presumes the normal functioning and processing of language abilities.

[10] Three key processes illustrate how the neural networks for oral language contribute to the composition of written language: 1) phoneme discrimination in early reading development; 2) the roles of the phonological loop and inner voice for verbal working memory; and 3) semantic interpretation of both read and heard words occurs in the same frontal part of the brain (Kellogg, 2013).

thinking. For each area, the discussion examines how writerly tool use relates, if at all, to the identification and explanations of the cognitive processes of writing.[11]

While having yet to establish the functional roles[12] of many brain areas activated during writing (Purcell, Turkeltaub, & Eden, 2011), neuroscience continues to magnify the processes involved in composing and to highlight the diversity of neurobiological activity at the root of the writing experience. Research using fMRIs to identify the parts of the brain involved in writing focuses on the processes of recalling and planning to write letters (Sugihara et al., 2006). Those processes have been identified as including: graphic-motor planning (the correct sequencing of motor processes for both handwriting and typing), letter-shape conversion (for handwriting), orthographic working memory and long-term memory, phoneme-grapheme conversion, semantic processing, and phonological and visual systems (those for producing and processing unfamiliar inputs and long-term memory activation for familiar or high-frequency words). Such cognitive activity occurs before any physical activity; brain research on the grapho-motor system (the writing hand) will be discussed below. While brain research continues to identify areas and patterns of activation involved in word-form language tasks, studies on cognition while composing have yet to be reported (Berninger & Winn, 2006). Yet brain research's understanding of the inner brain-mind of the writer and their environment as a united interacting system suggests that writerly tool interaction will be accounted for in future composing studies.

Since the publication of Flower & Hayes's (1981) model, cognitive writing models have sought to explain the cognitive processes of writing, yet with inconsistent views on the writer's environment and tool use, in particular. Nonetheless, the majority of cognitive writing research emerges from or operates within these models. As this study is interested in ways of thinking while writing, examining how existing theory treats writerly tool use in advanced writers is germane. One illustration of the fluctuating views is the evolution of Flower & Hayes's model. The model, published in 1981, identifies and categorizes cognitive writing processes with reference to the task environment. Over a decade later, Hayes's (1996) revised model accounts exclusively for ways of thinking with reference to text but independent of apparent text

[11] For further information on cognition while composing, writing research offers insights into the various cognitive skills (Deane et al., 2008) and strategies (Graham & Perin, 2007) that benefit the writing process.
[12] This especially includes the peripheral processes of writing.

progress.[13] Hayes relates such ways of thinking to understandings of long-term memory, working memory, and self-regulation and their corresponding cognitive capacities. Yet it is agreed that resources are limited and, thus, the effort of writing processes must compete for those cognitive capacities (Deane et al., 2008). While the use of writerly tools – during, *ad minimum,* transcription – places varying demands on cognitive resources, their influence or interference is not acknowledged. Meanwhile, research suggests that transcription variably interferes with the cognitive processes of composing, relative to its automation (Berninger, 1999). Like transcription, information retrieval involves varying degrees of automation. Within influential cognitive models, explanations of how information is retrieved in advanced writing vary (Deane, et al., 2008). Galbraith (2009), however, contends that knowledge construction in advanced writing entails dual conscious and unconscious processes: respectively, knowledge transforming, and knowledge constituting. Even still, these models do not account for the external accessibility of information through digital surfaces and implements.

Cognitive writing modes offer frameworks for identifying and categorizing the corresponding processes involved in writing. However, they do not address relationships, including whether and, if so, how uses of surfaces and implements relate to ways of thinking while writing. Turning to theoretical work on the unique relationship between writing and thinking offers insights. According to Harris (1989), writing restructures thought by

1. implying the 'validity of unsponsored language';
2. the existence of written words independent of their authors;
3. operating free from the social conventions and categories that constrain talk.

Key to these explanations is his notion of the 'autoglottic space': the conceptual distance that exists between an utterance and a sentence. This is not to say that all writing is autonomous (Olson, 1995). Rather, as Olson explains, writing enables one to consider sentences independently of their production – meaning apart from intentions and social contexts – and to be aware of linguistic structures. Olson adds that literacy offers 'a new mentality' (p. 295). This suggests that writing affords opportunities for and ways of thinking about language that enable critical thinking. Accordingly, unique ways of thinking and a particular mentality emerge in relation to externalized written texts and their linguistic features.

[13] Hayes, for example, replaced categories such as drafting and editing, which are based upon external distinctions, with reflection, text interpretation, and text production. Though the latter set of categories is applicable across nearly all writing tasks, the varying complexity of each process places correspondingly diverse demands on cognition.

### 2.3.2 Physical Activity and Writerly Tool Use

As noted, writing research into the activity, or physicality, of writing with reference to uses of surfaces and implements is primarily concerned with the role of transcription in the development of writing skills. Yet a writing process can entail an array of fine (e.g. pressing keys on a keyboard) and gross (e.g. postural control) motor skills. Tracing the analysis through key insights from writing research on transcription, this discussion will highlight how writing is a physical activity in ways that matter for writerly thinking, and vice versa. This review has found that research has yet to examine comprehensively the gross motor activity of writing and the relevant relationships and implications of digital writerly tool activity. Thus, work on reading and embodied cognition is discussed in an effort to ground an enquiry into how the physical activity of writerly tool use interrelates with thinking while writing.

Numerous studies on the development of transcription skills among young children demonstrate relationships between the physical activity of using an implement to write by hand and the thinking involved. A study of 3- to 4-year-olds' writing and drawing found, despite indistinguishable differences in the outcomes, that those children's motor plans differed for the two tasks (Bretherton et al., 1996). This highlights the role of a particular tacit knowledge in writing activity (Tolchinsky, 2006) and a relationship between the nature of what one is transcribing and the preceding activity and thinking. Experimental research with Japanese students (Matsuo et al., 2001) suggests that knowledge of what one is writing also influences the physical and mental activity of transcription (Berninger & Winn, 2006): the integration of orthographic and motor inputs for automatic (e.g. copying) and non-automatic (e.g. strategic) writing by hand involves different neural pathways. Further, research suggests that the accurate representation and retrieval of orthographic codes for graphic motor production affects the ease with which one learns how to write by hand and to spell (Berninger, 1999).

These transcription studies reveal that the experience of writing by hand is characterized by a variety of interrelationships between the motor activity and ways of thinking while writing. Fluent handwriting entails certain fine motor skills with corresponding resource demands that are distinct from those of typing. Evidently, writing by hand and typing involve manifestly different physical activities. To date, however, research has yet to consider the developmental perspective: whether obviating learning the fine motor skills of writing by hand has implications for learning to write – and all thinking while writing. Yet even in future writing research, those differences

might be confined to transcription. Recent research on differences between handwriting and typing among college students and professional writers, though limited, will be reviewed in Section 2.4. Writing, however, is a physical activity in ways that are largely absent from writing research. Uses of surfaces and implements are as much cognitive as they are physical. Research into uses of surfaces and implements must account for both dimensions and acknowledge that the writing process entails a range of physical activity. To ground such conceptualizations for research, this discussion will now highlight reading research and work on embodied cognition. Embodied cognition, in particular, offers a framework for theorizing about the physical activity of writerly tool use with reference to sophisticated ways of thinking while writing.

Research indicates that separate areas of the brain respond to distinct features of speech and visual stimuli (Fahnestock, 2005; Ardila, 2012). When seeing a letter, for example, the brain will process the shape – orthography – of the individual letter in different areas from its other defining elements, including the spatial position and movement or animation, the colour, and its depth. Such fragmentation also occurs for the diverse features of a sound. This suggests that actions – and perception – are at the root of the writing experience. That view is illuminated by theories on embodied cognition. Applied to writing, embodied cognition argues that the motor-sensory experiences involved in composing a text are cognitively processed (Koziol et al., 2012; Kiefer & Trumpp, 2012). As motor skills are shaped by prior conceptions, use in process, and future plans (Rosenbaum, 2010), research into embodied cognition suggests, *ad minimum*, that the physical interaction with and the perceptual experience of writing surfaces and implements are mediated in practice by mental activity.[14] Varela et al. (1991), for example, develop understandings of embodied cognition through the concept of *embodied action.*[15] Here cognition is embedded throughout the concept's meaning in an effort to depart from traditional binary frameworks – complicated by terminology – that isolate cognition from perception and action. This ultimately aims to highlight the fluid and mutually impactful roles of both the experiences of sensorimotor action and the contexts in which the capacities that filter those experiences operate.

[14] Thus, embodied cognition acknowledges the influence of context on capacities for experiencing – mental activity.
[15] Here the term 'embodied' reflects the idea that thoughts during an experience are a result of individual sensorimotor capacities, which develop and exist within a 'biological, psychological, and cultural context' (p. 173). The term 'action' highlights the related understanding that motor and sensory processes are inseparable in cognition (Varela et al., 1991).

### 2.3.3 The Phenomenology of Writing

Accounting for all elements of the processes and activities of writing, embodied cognition offers a framework through which to make sense of and to examine the practice of writing – and all of the thinking, moving, and feeling involved – through the writer's mind. What occurs and what a writer experiences, however, are not necessarily one and the same. For research into the lived experience of writing and using writing tools, this section turns to studies investigating the phenomenology of writing. Work on the phenomenology of writing offers detailed and precise explanations and interpretations of individual, lived writing experiences. In addition to their content, the presentation of the findings in phenomenological studies exemplifies how to capture and report on the lived experience of writing with fidelity to the data. Thus, this discussion offers substantive and methodological insights: the experiential dimension is critical to understanding writerly tool use across different formats, and any related enquiries are best pursued through an interpretive framework – for reasons that will be explained.

Having analysed the self-reports of literary writers' experiences of writing, Chandler (1992) proposes that writerly tool use is governed by convenience and a fundamentally personal relationship to the meaning of the writing process and the corresponding role that the medium plays. According to Chandler, writers experience the meaning of writing on a spectrum. At one end, 'Planners' view writing as a medium for transcribing already planned or crafted thinking. At the other end, 'Discoverers' find that the process of writing reveals their thinking. Chandler contends that the process and product of different formats may be tied to such underlying experiential orientations to writing – and not to composing strategies or composing practices, nor to literary tradition or personality types. Through his phenomenological framework, Chandler endeavours to explain writerly tool use as a function of the support provided for the desired experience. Different surfaces and implements possess distinct properties that afford different experiences and traces of the writing processes. Despite reflecting a full appreciation for the diverse, lived experience of writing and offering sound insights, Chandler's presentation of relationships between writerly tools and writerly experiences lacks structure, reading like a litany of astute observations. Further, his identification of formative tool features,[16] while perceptive,

[16] These are: 1) directness of transcription, 2) uniformity of script, 3) speed of transcription, 4) linearity of composition, and 5) boundedness of surface (Chandler, 1992).

reflects his phenomenological approach and thus attends exclusively to temporal and spatial implications.

Lyman (1984), studying the writing experience of 135 humanists at Stanford using computers for qualitative research, echoes the reports that technology alters the phenomenology of writing. Interestingly, he draws on writing as thinking to illustrate key differences, finding that the spoken voice becomes increasingly prevalent and the authority of typeface on the computer is perceived manifestly sooner. Similarly applying phenomenology to develop understandings of writing with technology, Van Manen & Adams (2009) focus on the experience and space of writing online. In the introduction to their work, the researchers ask how different writerly tools contribute to writerly thoughts. While this is not their ultimate research question, it is important to note that the question assumes a correlation (between writerly tools and thoughts). Detailing the experience and space of writing with particular reference to the online space, Van Manen and Adams argue that writing online intensifies the spatial and temporal relationships involved, and raises questions for reflection, social dynamics, and security or privacy. Yet, for Van Manen and Adams, as is the case with Chandler and Lyman, ways of thinking while writing with the different implements and surfaces are a function of or induced by differences in the space of writing and temporal characteristics of the different environments.

Through phenomenological work on writing, the individual experience of writerly tool use acquires the lived dimension. Various aspects of time and space, and how writers experience them, are integral to their lived experience of writing and, accordingly, both how they think while writing and any precise explanations of those ways of thinking. This suggests that an enquiry into the scope of writerly ways of thinking and tool use across different formats must account for the phenomenological dimension of writing. Further, in-depth qualitative self-reports from writers on their experiences and instances of writerly tool use offer a type of data in line with the essence of such an enquiry. The value of applying an interpretive framework, therefore, stems from both the enquiry's interest in writerly tool use as a complex phenomenon and the type of data that might yield insights.

Grounded by the prior explanations of influential environmental factors and the individual experience of writerly tool use, the following and final section of this literature review will bring the analysis to recent research into the uses of writing implements and surfaces.

## 2.4 Writing Implements and Surfaces: Recent Research

This section presents how the study's key concepts outlined in Section 2.1 – writing as thinking, the writing process, and surfaces and implements – have been studied and analysed with specific reference to technology within the past decade. The section examines:

1. writing as thinking with technology;
2. the writing process with technology;
3. digital surfaces and implements.

Each discussion reveals how technology is being used both to write and to research writing. How technology shapes and illuminates this study's key concepts has been integral to their sculpting and application, as well as to the study's design and implementation. Thus, the subsections that follow seek to enhance – and not to alter – our understanding of those concepts. In concluding the review, this section grounds the study's underlying conceptual foundation, rooted firmly in existing and recent literature, in advance of detailing the study design that emerges in the subsequent chapters.

### 2.4.1 Writing as Thinking with Technology

Using an automated tool, CohMetrix, McNamara, Crossley and McCarthy (2010) challenge whether cohesion distinguishes writing deemed, by the tool, to be of high quality. Through an analysis of variance, the researchers conclude that writing quality within the essays analysed is not distinguished by cohesion. The analysis proposes instead that good student writing is characterized by specific indices of syntactic complexity, lexical diversity, and sophisticated word usage. Interestingly, those qualities primarily reflect superficial, textual elements that arguably are value laden (e.g. associating intelligence with sounding sophisticated). On the point of cohesion, the tool identified such instances according to connectives and co-references. Yet, as Pinker (2014) demonstrates, many skilled writers create coherent discourse through techniques that appeal to reason (i.e. relationships among ideas) and do not necessarily operate as linguistic components. An abundance of connectives is not the only evidence for a writerly application of cohesion.

Though improvement will continue, recent applications of text-analysis tools merely illustrate how visible text is but one window into understanding writing as thinking. Efforts to theorize writing as thinking with technology have been similarly constrained. To conceptualize the development of tools and software for writing, Pea and Kurland (1987) adopt a view of

writing according to the cognitive processing model. The resulting suggestions include supports for brainstorming; tools that provide prompts (i.e. for developing ideas and setting goals); topical inspiration; digital notecards for organizing and the use of different modules (or spaces) for monitoring; dictation software; formats that facilitate re-reading; tools that document dialogue *about* a text; artificial intelligence feedback in natural language; and tools that represent a text in different ways (e.g. Microsoft Word's Document Map Pane). Emerging from the basis of the cognitive processing model, the proposed ideas are bound by a limited view of the writing experience.

Theoretical work on how technology shapes literacy, while extensive, remains broad (MacArthur, 2006). Arguments regarding the effects of non-linear and predominantly visual hypermedia (Bolter, 1998), such visuals and organizations of information for engendering new meaning and multidirectional thinking (Purves, 1998), and new symbols and interactions (Perkins, 1985) illustrate the range of claims that have been made and definitions of writing (e.g. incorporating hypermedia) in doing so. Returning to writing as thinking, Pinker contends that writerly ways of thinking may be learned through the reading of good writers to develop 'a writerly ear' (2014, p. 12). Pinker continues to emphasize *master* writers as the ideal resource for lessons on writerly ways of thinking. While advanced writers have been studied to understand writing as thinking – as noted – whether, and if so, how their uses of technology relate to writerly ways of thinking have yet to be examined. Moreover, understandings of the relationships between uses of technology and writerly ways of thinking for any population remain sparse.

### 2.4.2 The Writing Process with Technology

After stating their interest in how the writing process is being shaped by technology, Berninger and Winn (2006) review existing research with a focus on the interaction between the inner world of the writer and their external environment. Their intent to illuminate writerly interaction with technology translates into an emphasis on the processing and production that occurs, and how those dynamics are being changed. Citing software prompts and the use of digital formats (e.g. PowerPoint), the researchers indicate that digital tools offer opportunities for different writing practices. Their enquiry, however, does not go further, which leaves the reader wondering how mental behaviours might be changing during these new practices, what ways of thinking occur with digital tools, and how they might be harnessed for a more productive writing process. Moreover, the focus on interaction neglects to account for changes to the motor-sensory

activity. As noted in Sections 2.3.2 and 2.3.3, the different motor-sensory and phenomenological experiences of using technology throughout the writing process raise the potential of embodied cognition and an interpretive framework for developing further understandings.

How are digital devices altering the production and processing of written information? Another word for the processing of written information from screens is 'reading'. Research indicates that, while reading, screens have a demonstrably negative impact on comprehension, visual acuity, recall, reading rate, and concentration (Kerr & Symons, 2006; Jeong, 2012; Mangen et al., 2013). This research has primarily been conducted with school-age participants who, when given the option – particularly for sustained reading – even prefer paper books to an e-reader. Yet those same students view e-books as useful reading devices and, meanwhile, e-book popularity continues to grow (Pew Research Center, 2014). This tension may be explained, in part, by the reality that reducing task load is a general goal of effective interaction design (Rosinski & Squire, 2009). Effective interfaces offer cues to facilitate their use. Thus, despite the negative impact of screens for reading, the ease of the interaction renders them efficient in that regard. This suggests that effectively processing information from screens will continue to require learning and understanding new behaviours. How screens shape the writing process, however, has not been examined.

Work on automation illuminates one way in which the production of writing is being altered by digital devices.[17] Analysing the implications of automation for mental activity and human behaviour, Carr (2014) cites the substitution myth (Christoffersen & Woods, 2002) to explain how automating tasks changes the entire process and not simply the targeted component. Further, research (Ophir et al., 2009) suggests that heavy interaction with keyboards and screens automates certain behaviours across tasks with the real-time implications going unnoticed. This suggests that the tools available through digital writing platforms do not simply provide substitutes for the individual tasks and may be changing the process in ways that are not immediately evident to the technology user. The nature of the entire process of writing, according to the substitution myth, is changed by the automation of – for example – spell check, formatting, copying, and pasting. When transcribing written language through a touchscreen or keyboard, writers are sharing the transcription task with an automated device that shapes

[17] Though this paragraph focuses on the generation of content, Carr's work illustrates how automation affects other processes that are constituent of writing, including spatial perception, creativity, memory, and stimulation while working.

interaction – roles and responsibilities – by informing which tasks each party contributes (Carr, 2014). Such changes to the nature of the process, therefore, extend to individual writers – their skills and orientations, *inter alia*. Different features of and tools within digital devices emphasize different processes, indicating that the writer's contribution to the writing process and outcome is altered. Considering the writing process in full seems essential to capturing how technology relates to writerly ways of thinking.

### 2.4.3 Digital Surfaces and Implements

Recent research into writing implements and surfaces has been conducted in unnatural contexts, applied traditional cognitive writing models, and used disruptive data-collection methods with little accounting for the background – contextual influences – of research participants. This research has primarily focused on the use of keyboards (Alves et al., 2008) and screens, with some studies analysing them in comparison to perceptions of paper and pencils (Brockmole et al., 2013) and others to handwriting (Mangen & Velay, 2010; Nakamura et al., 2012; Mogey et al., 2012). These studies have yet to illuminate how surfaces and implements relate to thinking while writing and what factors contribute to those relationships. Nonetheless, contextualized insights from recent research into writing quality and writing across formats, as well as theoretical work on technology and literacy – which has been cited throughout this chapter – have informed the conceptualization of this study.

Using interviews with authors published online, Oatley and Djikic (2008) conclude: '[t]he external memory of paper assists composition' (p. 17). While this assertion uses the word 'paper', writing surface was analysed as a constant throughout their study; different properties of or associated with different writing surfaces were not considered. Menary (2007) advances the role of the writing surface by arguing that the visualization it affords contributes to thinking by enabling the manipulation of thoughts – and not merely by supporting one's memory. This work, on the role of writing surfaces, affirms their importance for writing as thinking. However, whether the distinct properties of different surfaces impacts thinking while writing remains unclear. Research on screens highlights some of their unique features: interactivity, accessibility, flexibility, and eco-friendliness (Pew Research Center, 2014). As the previously cited reading research demonstrates, to date these features have not been conducive to deep reading. How screens relate to writerly ways of thinking has not been analysed.

Fundamental to understanding how ways of thinking while writing relate to uses of surfaces and implements is identifying key influences. While the primary activities characterizing putting a pen or pencil to paper are drawing and writing, those of production, tapping fingertips to letter keys, may serve a variety of both productive and consumer tasks. Further, the broader use of implements and surfaces raises significant questions for their roles in writing. Connected to screens, keyboards are used for engaging in an array of non-writerly tasks. Environmental factors – whether cultural, social, or technical – should be accounted for in future research into digital surfaces and implements.

## 2.5 Researching Writing: An Interdisciplinary Approach

To explore writerly tool use for writing as thinking, drawing on a truly interdisciplinary approach offers comprehensive and pragmatic theoretical underpinnings. As noted in Chapter 1, the guiding inquiry for this study reflects a neuro-anthropological orientation. It is this orientation that facilitated the construction of the research questions: their focus, structure and sequence. Key to neuro-anthropology are the views that the brain is the source of human behaviour and experience, and that rich field research is foundational to developing understandings of their variability (Lende & Downey, 2012). As explained in Section 2.3.3, in-depth qualitative self-reports present a window into the behaviours and experiences of writers. Such data, however, must account for the processes of interpretation through which humans make meaning. This highlights value in both a neuro-anthropological orientation and an interpretive framework. Although scientific and intepretivist thinking reflect distinct views on what constitute knowledge and how knowledge is made, principles of pragmatism (Morgan, 2014) illuminate how two paradigms might benefit and be resolved within a single study. Accordingly, to ground ensuing discussions of and references to this study's interdisciplinary design, this section elaborates on neuro-anthropology and interpretivism, and the implications of their joint application for research into writing as thinking.

### 2.5.1 Neuro-anthropology and Interpretivism

This section discusses neuro-anthropology and interpretivism to highlight why and how each approach might contribute to this study's design and implementation. While formal efforts to

establish the field are recent[18], the term 'neuro-anthropology' has been employed for decades (Lende & Downey, 2012)[19]. Engaging neuroscience and anthropology, neuro-anthropology focuses on the interrelations of the brain and culture to study the scope of human behaviour and influential factors. In this thinking, neuroscience locates the brain – and the nervous system – as the way through which to study and to understand human experience and behaviour. Key to understanding human experience and behaviour, in full, is the role of surroundings. This point is supported by recent findings (Kandel, 1999) on the variability, plasticity and responsiveness of human behaviour. To study the relations between humans and their surroundings, anthropology contributes the potential of applying rich, qualitative methods in natural settings, for identifying ranges of dynamics and influential factors. Field research employing ethnographic methods is, therefore, a core tenet of the neuro-anthropological approach. Accordingly, neuro-anthropology orients research into human experience and behaviours through the brain, and explains how qualitative field work is integral to developing related insights.

Inherent to neuro-anthropology's mutual engagement of distinct ways of thinking is a commitment to productive frameworks that cross disciplinary lines. This study is positioned to do just that: cross theoretical lines. As discussed, the nature of this thesis' guiding inquiry seeks to explore writerly tool use through the mind of the writer. A neuro-anthropological framing illuminates how the mind continuously is shaped by its surroundings and subjective experiences of awareness (Siegel, 2012), and clarifies that such reports reflect natural schemas. Those reports also are, by nature, products of human processes of language. Such activity is illuminated by the interpretive tradition, which maintains that meaning is expressed through situated human language (Miles & Huberman, 1994). Without discounting the view that writers' behaviours and experiences are the result of interrelations between their minds and surroundings, this study turns to interpretivism to explain why and how in-depth qualitative self-reports offer meaning.

### 2.5.2 Theoretical and Methodological Implications

How might one study work with two contradictory paradigms? Having discussed how a neuro-anthropological orientation and an interpretive framework each might contribute to researching the interests of this thesis, this section draws on principles of the pragmatic paradigm to explore

[18] The first independent conference was held in 2009.
[19] Oliver Sacks, M.D., referred to himself as a neuroanthropologist in the mid-1990s.

the conceptual implications[20], particularly with reference to this study's theoretical position on writing as thinking.

Positivism holds that there is one truth (i.e. reality exists apart from understanding), while an interpretivist view maintains that reality is subjective (i.e. created by our understanding) and that a single objective reality does not exist. Integrating two distinct paradigms, neuro-anthropology and interpretivism, therefore, seemingly invokes two distinct ways of viewing reality and its creation. However, while neuro-anthropology reflects a scientific understanding of reality, it also upholds an anthropological commitment to interpretivism. Embedded within a neuro-anthropological orientation, therefore, is a belief in the contributions made by examining behaviours and experiences as the product of subjective experiences. Such subjective experience – emerging from the awareness of consciousness – is, as noted, a feature of the understanding of the mind adopted by this thesis and, thus, rooted in scientific understandings. Thus, knowledge – or what is known – reflects natural schema that acquire meaning through existence that is subjectively experienced and interpreted.

Treating biology and experience separately reflects a methodological approach promoted by the pragmatic paradigm (Mason, 2009). The pragmatic paradigm acknowledges that there are natural systems and varied human interpretations of those systems (Morgan, 2007). Knowledge, according to this reasoning, is based in process, where the defining process is inquiry. Drawing on John Dewey's explanation of inquiry, Morgan (2014) elaborates on how the pragmatic paradigm views knowledge as emerging though on-going inquiry into beliefs as the basis for action, all while accounting for a given context. Within this view, experience is social, context-dependent, and involving processes of interpretation – while bound within the natural world (Morgan, 2014). Locating the development of and efforts to understand human behaviour through the experience of reality explains why writing, ultimately, might be viewed as thinking reflective of certain cognitive and embodied schema, which are realized and acquire meaning through the lived experience. Individual, experience, therefore, offers a window through which to explore what constitutes that thinking for writers and the implications of interactions with their surroundings.

According to the pragmatic paradigm, developing understandings of reality ought to be situated through the lived experience, and not metaphysical theorizing. Research approaches are

[20] How the methodological implications were realized in practice is noted in Chapter 4.

to be distinguished not by their views on the nature of reality, but by whether the established questions are answered by the planned inquiries (Feilzer, 2010). This focus on developing understandings from experience aligns with this study's methodological orientation to explore writing as thinking – through the lens of the writer's mind. It illuminates, for example, how the brain can be viewed as a natural system, and the mind as emerging through interpreted experience of the interactions between the brain and its surroundings. Further, this legitimizes self-reports on individual experiences as a way to capture` the minds of writers. Thus, pragmatism not only explains how two paradigms may be resolved within one study, but also reinforces the conceptual cohesion underpinning research that spans disciplines and that acknowledges natural systems amidst varied human experience. Drawing on neuro-anthropology to guide the orientation and conceptual architecture of this study and interpretivism to clarify the nature of the data sought, represents a truly interdisciplinary and pragmatic approach to exploring the inquiry in the most authentic way possible.

As this chapter has demonstrated, uses of writing surfaces and implements, and the phenomena raised by those dynamics, continue to be studied by diverse disciplines. Each discipline applies different methodologies, collecting and analysing distinct sources of data. Patterns of neural activity, experiences of mental representations, and written texts are all sources of data that offer insights into the writing experience. However, the collection of each source reflects a different methodology and epistemology that orients the corresponding enquiry in ways that exclude factors and behaviours characteristic of natural writing practice. For example, the premise of analytical linguistics neglects the communicative function and interactive nature of language; cognitive scientists ignore how an individual's objectives shape their use of language, its production, and comprehension (Fahnestock, 2005); and research conducted by psycho- and neuro-linguists studies language use in unnatural and artificial contexts.

Although empirical research into the impact of technology on ways of thinking while composing have been mixed (Hawisher & Selfe, 1991) and limited (MacArthur, 2006), and research into the use of screens and keyboards has a particularly short history, existing work does suggest that differences in surfaces and implements alters the experience of writing. As this chapter has aimed to convey, research has yet to explain how differences in uses of writing surfaces and implements relate to the thinking while writing and which contextual factors shape

those dynamics. While constrained, the content and methodologies of research reviewed in this chapter and raised by this study's focus magnify the potential value of conducting future studies into the phenomena with attention to comprehensive theoretical bases, contextual influences, and natural experiences. How this study attempts to accomplish that and what it finds is the focus of the following chapters.

# Chapter 3: Research Aims, Questions, and Conceptual Framework

Before diving into the study's methodology and research design, this brief chapter introduces the aims, clarifies the research questions, and outlines the rationale. The chapter serves to regroup substantively and formally in transitioning from existing literature to this study's execution and findings.

## 3.1 Research Aims

Throughout history, new modes of transcription have changed writing practices and the ways of thinking that constitute the writing process, theoretically and experientially. This study endeavours to understand such possibilities in the present: the practices and processes that contemporary writers – experts and students – might consider with writerly tools available. This overarching aim translates into the following three goals for the research:

1. To understand what influences when and how writing implements and surfaces are used.
2. To identify which modes of transcription support which ways of thinking for which individuals.
3. To develop understanding of how writers might effectively use the modes of transcription available.

These goals involve investigating which and how elements of an individual's writing experience – the immediate practice and contextual influences – support which writerly ways of thinking. A focus on writerly ways of thinking that reflect or aspire to those that characterize writing expertise[21] will set a standard through which to conduct cohesive theoretical and in-field research across experts and students. This approach realizes the study's explicit overarching aim of understanding possibilities for student writers and is explained by the implicit aim of generating pedagogical insights. Together the aim and goals direct the study to consider whether new ways of thinking for writing and developing writing skills might be nurtured through personalized and effective uses of implements and surfaces available.

[21] Please see Chapter 2 for an overview of what characterizes writing expertise; further information about the construct's conceptual role in this study is outlined in Chapter 4.

## 3.2 Research Questions for this Study

Informed by the review of literature and the research aims, this section refines the research questions as presented in the focus of this study. Specifically, the technical research questions (Bassey, 1999) for this study have been developed; these are listed below each of the two main research questions. The research and technical questions are as follows:

1. **How are writing implements and surfaces related to writerly ways of thinking while composing?**
    a. When and why do writers use non-digital writing implements and surfaces?
    b. When and why do writers use digital writing implements and surfaces?
    c. How are writerly ways of thinking supported by uses of surfaces and implements?
2. **What are the writers' pre-existing behaviours, ways of thinking, and collective experiences of writing that contribute to how implements and surfaces are used in specific situations?**
    a. What are the contextual cues that shape how writers perceive and act when using surfaces and implements?
    b. What are the orientations, conceptions, and impressions that inform how writers use surfaces and implements?
    c. How do experiences of the effort and attention involved in writing relate to uses of surfaces and implements?

Each of the technical questions targets one element. Together these are intended to inform a discussion of whether people think differently with different implements and surfaces, and if so why. That discussion will clarify fundamental assumptions in this research in order to ground the development of understandings sought by the study's goals. This will lead to a cohesive response to the overarching question of whether writers might enhance the writing process through effective and innovative uses of implements and surfaces.

## 3.3 Research Design: the Conceptual Framework and Rationale

Underpinning the research questions, this study's conceptual framework is sequenced according to two principles of the neuro-anthropological approach (Duque et al., 2010). First, this study upholds a view of the mind as operating as an integrated whole in a situated, integrated context. Second, the study maintains that perception of all human experience is a function of the mind.

These two points explain why and how this study employs the mind as the lens through which to design the research. Thus, the focus, aims, and guiding enquiries of this study have been constructed from and bound by a holistic approach to and prioritization of the writer's mind. How this foundation leads to the technical questions and their realization through the research design is outlined below.

The technical questions reflect careful consideration of which data should be collected and which information and processes should be understood to answer fully each research question. That conceptualization has been guided by a consistent view of the desired writing process: that of an expert writer – one with knowledge-crafting abilities. Thus, the expert writer is the theoretical subject and object across the technical research questions, though the study seeks to develop understandings that are of relevance to both sophisticated and student writers. This follows from the notions that writing expertise requires writerly thinking expertise and that all writers might learn from – and should aspire to – such quality. While expert writers are not necessarily the most innovative users of writing implements and surfaces, this study evaluates writerly tools initially according to the quality of the use: the particular writing practice and context. Critical to the relevance and rigor of the study's findings will be its exploration of uses according to the highest writing standard.

Research into the technical questions will be conducted in two parts: one being theoretical and one involving in-depth fieldwork. Part 1 will investigate the questions in relationship to expert writers in order to develop a theoretical framework that will guide Part 2: rich qualitative data collection of students' writerly implement and surface use in a technology-rich high school. The development of theoretical perspectives on the research questions supports the study in researching writing despite the theoretically incomplete nature of previous research. The conceptual scaffolding interweaves the theoretical and the experiential, the expert and the student, the thinking and tool use, all through a holistic view of the mind of the writer.

# Chapter 4: Research Methodology

This chapter outlines the study's methodological approach. Its theoretical cohesion becomes apparent through the collective contributions of each section. The chapter begins by outlining the study's holistic methodology and the nature of the data sought. Why the study was designed and conducted in two stages is clarified in these sections. Accordingly, each stage is discussed separately in Sections 4.3 and 4.4. Each of those sections explains the corresponding sample, and how the data were collected and analysed. The chapter concludes by highlighting the ethical considerations raised by the study and by examining the authenticity of the findings.

## 4.1 Interdisciplinary Methodological Approach

This study has been conceptualized across disciplines – the humanities, social sciences, cultural anthropology and the physical sciences. It engages writerly, pedagogical, psychological, physiological and technological dimensions and, as noted, takes a qualitative approach to investigate the research questions. As outlined in Section 2.5, the study's theoretical core mixes both scientific and interpretive arguments – and assumptions. Aligned with a scientific view, the study holds that fundamental schemas exist at the basis of human activity. Not mutually exclusive, according to this study, an interpretive view contributes the notion that people develop individual differences and behaviours from those natural schemas. The distinct, corresponding ontological and epistemological bases of each view (Cohen et al., 2007) ground the study further through their distinct views on social phenomena and what constitutes knowledge.

### 4.1.1 Neuro-anthropology

Integrating two epistemological views reflects an acknowledgement of their mutually beneficial contributions and the effort to conduct a rigorous and trustworthy study, enhanced by theoretical debates. From the scientific view, the study specifically employs a neuro-anthropological approach (Duque et al., 2010), as discussed. Regarding what constitutes knowledge of the lived experience, the approach holds the view, adopted here, that it should be examined through mental activity. Further, such knowledge should be refined through iterative exploratory and experimental research. Developed as the former, this study's inherent aim of identifying and understanding leads to its use of the interpretive tradition to explain what constitutes meaningful data of human experience in natural settings.

### 4.1.2 Interpretivism

The interpretive tradition holds that meaning is expressed through the situated practice of language in human activity (Miles & Huberman, 1994). In line with this perspective, an individual's lived experience involves certain objective elements, which might exist without being experienced by that individual or through the experience of it by other individuals. The lived experience, from this view, is simultaneously an objectively personal reality and an intersubjective reality. In a reality of objective intersubjectivity (Sandberg, 2005), meaning is established through language and the lived experience. This suggests that experiences in natural settings and language-rich accounts offer valuable sources of data. Making sense of those data, however, will benefit from the use of the scientific paradigm. Thus, each paradigm, the scientific and interpretive, is applied to clarify its respective approach to knowledge.

## 4.2 Justification for Methods

The focus of this study is on how writing implements and surfaces, and writerly ways of thinking interrelate, and which pre-existing factors and experiences (e.g. individual characteristics and beliefs) influence those relationships. Following the nature of the research questions, data will be sought for identifying and examining – not measuring – the critical factors involved and their patterns of activity (Lincoln & Guba, 1986). From the view of experiential understanding and knowledge espoused by the interdisciplinary interpretivist approach outlined above, the study holds that a writer's cognition shapes and is shaped by experiences that are a result of individual capacities for action and perception, which develop and exist within psychological, physiological, and cultural contexts (Varela et al., 1991). Writers develop their writing behaviours and practices – automatically and purposefully – through a mental and physical engagement of the writing process shaped by their situated contexts.

### 4.2.1 Nature of Data Sought

Thus, this study aims to capture naturalistic instances and interpretations of uses of implements and surfaces for composing. Key to this study's selection of data sources and collection methods is the view that writers' self-reports represent a rich source of data on the cognition and metacognition involved in composing (Faigley et al., 1986; Cameron, 2001). A popular method among writing researchers for collecting such data is think-aloud protocols (Witte & Cherry, 1994; Tomlinson, 1984). This approach, however, is problematized by the possibility that the

process of thinking aloud alters the writer's natural activity and, thus, the cognitive processes involved. For this reason and because of this study's interest in the holistic experience of writing, think-aloud protocols were not used. Instead, the study adopts in-depth qualitative methods to collect writers' self-reports on their experiences in natural settings. This reflects the view that the rigorous triangulation of self-reports presents the best way to enter the mind and experience of writers without altering the activity or changing the setting.

### 4.2.2 Rationale for Distinct Data Sources

Identifying the general nature of the data desired – writers' self-reports – and reviewing the corresponding methods of collection, all in the light of research questions, indicated the ideal data for this study. To begin to answer the research questions, data on both psychologically sophisticated writing processes and instances of innovative and evolving uses of surfaces and implements would be necessary. While such data exist, the best source in each instance is different. Sophisticated writers, as discussed, are the model source of ways of thinking while writing. However, advanced student writers who have been raised writing with technology present a potentially richer source of pedagogical insights and innovative practices. This led the study to pursue its sources and, thus, the methods used in two stages. Stage 1 focuses on expert writers in order to identify how writing surfaces and implements relate to writerly ways of thinking. Stage 2 examines the research questions with respect to student writers, who both were raised with technology and, at the time of data collection, were immersed in formal learning. While stage 1 examines the writerly and psychological dimensions of the research questions, stage 2 explores the technological and pedagogical natures of the enquiries.

## 4.3 Stage 1: Content Analysis of Interviews from the *Paris Review*

Seeking in-depth accounts from expert writers of prose on their interaction with their writing surfaces and implements, stage 1 of this study turned to the *Paris Review*: its ten volumes of published interviews[22] and relevant secondary sources for verification. Research seeking to understand writing expertise (Oatley & Djikic, 2008) highlights the value of the interviews for their detailed accounts on the craft of writing and theories of composition, all from the world's most accomplished (primarily Anglophone) writers. For this stage of the study, a content

[22] The complete collection of interviews is published online and all original manuscripts have been archived at the Pierpont Morgan Library in New York. For additional information on how and why the *Paris Review* is used in this study, see Section 5.1.

analysis of data extracted from the interviews was conducted guided by two established methods: 1) a process detailed by Cohen et al. (2007) – see Table 4.1 – and 2) tactics for generating meaning as outlined by Miles and Huberman (1994). The integration of these approaches aimed to provide a clear and cohesive theoretical foundation for this stage of the study that ensures the authenticity of the findings and their utility to stage 2.

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**Table 4.2. Cohen et al. (2007): the process of content analysis**

1) Define the research questions to be addressed by the content analysis
2) Define the population from which units of text are to be sampled
3) Define the sample to be included
4) Define the context of the generation of the document
5) Define the units of analysis
6) Decide the codes to be used in the analysis
7) Construct the categories for analysis
8) Conduct the coding and the categorizing of the data
9) Conduct the data analysis
10) Summarize
11) Make speculative inferences

---

### 4.3.1 Population and Sample

The population of interest for this stage of the study was expert writers. As discussed, expert writers are distinguished by their writerly ways of thinking. The nature and acclaim of their published work offer standards by which to identify such thinking and, thus, expert writers. The quality and number of the writers interviewed and the nature of the published texts and the archived manuscripts rendered the *Paris Review* interviews a highly appropriate source for a content analysis that applies the study's research questions to expert writers. Thus, the sample for this stage of the study was drawn from those writers who had been interviewed for the *Paris Review* – with the result printed in that journal. At the time of the interview, each writer had been published. The majority, if not all, continue to be world famous (Pamuk, 2007).

From the interviews, the primary data sought and then collected were writers' accounts of their use of writing surfaces or implements, or writing formats (e.g. typing or longhand). Thus the sample included those writers who referred to or commented on their uses of surfaces and

implements, and was defined as the data were being extracted. The choices made and the terms searched to extract the data shaped the nature of the resulting sample. As those decisions constituted how the data were collected, they are elaborated upon in the subsequent section. Further information about the substance of the sample – what distinguishes this literary publication, the writers who were interviewed, and the published interview text – is offered below.

Since the *Paris Review*'s initial interview in 1953 with E. M. Forster, few major writers have declined an invitation to be interviewed (Garner, 2010). The publication has been credited with changing the way interviews with writers were conducted: interviewers prepared painstakingly, asked questions thoroughly, and listened carefully (Cowley, 1957). Those techniques form the literary interview as known today and are used in research studies that involve interviewing writers (MacRobert, 2013). Additional defining features of the *Paris Review* process are the interviewees' active participation in determining the interview format and schedule and in editing the content, and their approval of the text in advance of publication. Therefore the published content reflects the manifest contributions of a writer's individual identity as well as the writers' collective identity – the medium and norms of the writerly community. The approach suggests that the published text accurately represents the writer according to the writer, making the interviews literary, interpretive, and authentic.

While the writers who comprise the sample are unified collectively by their publication in the *Paris Review,* their individual identities and backgrounds are strikingly diverse. Remarking on those writers who had been featured by 1957, Malcolm Cowley writes:

> The authors presented have come from the ruling class, the middle class or the working class of six different countries. They are Catholic, Protestant, Jewish or agnostic; old or young; married, permanently single or divorced; and they have had all sorts of education, from those who never finished secondary school (Simenon, Faulkner) to those who are university professors or fellows (Warren and Forster). Frank O'Connor started life as a gunman, Nelson Algren as a bindle stiff, Joyce Cary as a colonial official, while some of the others went straight into professional writing. All have strongly marked personalities which are revealed – asserted, one might say – in their simplest remarks, and no personality resembles any other.

Such variation characterizes the writers interviewed through to the present day, yet the writers all continue to have practised and experienced writing in a way that led to a work of significant acclaim. While the literal text of the *Paris Review* interviews itself is revealing, its context is

integral to appreciating the data source's singular value for this stage of this study. Relevant details of the content's many contextual layers contributed both substance and structure while extracting the sample and reducing it into a content inventory for analysis. Introductions written by each interviewer, for example, offer information about how the interviews were conducted and where, *inter alia*. True to literary style, the published interview texts, following their introductions, are crafted, polished, and revealing. The next section will discuss how the data were collected.

### 4.3.2 Data Collection

For extracting data from the published interviews, the primary criteria were sufficient reference to writing implements and surfaces, and publication of prose among the writer's work. Two series of interviews among those conducted by the *Paris Review* satisfied these requirements: the *Art of Fiction* and the *Art of Nonfiction.* Following this decision, data extraction occurred in stages. Having not conducted them myself, my familiarity with the interviews developed as the data were being extracted. As familiarity with the data increased, realizations continually occurred. What punctuated the data extraction and reduction, however, were formative realizations about what constituted meaningful and relevant references – or units of analysis. Such realizations qualitatively changed how the data subsequently were extracted, and, as will be discussed in the following section, reduced. The balance of this section details the data collection by highlighting the influential realizations and their implications.

The initial plan was to extract the data – and develop the sample – by conducting strategic searches of the *Art of Fiction* and the *Art of Nonfiction*. An initial list of terms for searching the online archives had been derived through a mind map of words for and related to writing implements and surfaces. As the interviews revealed previously omitted synonyms and other relevant words, the list was updated; the complete inventory is noted below. This approach anticipated that saturation would be reached as the interviews were being searched so that the findings would begin to reveal repeated meanings and render reviewing all of the interviews redundant.

Taking this approach, the first search performed was for the word 'pencil'. The data extracted from the interviews retrieved included the writer's complete response regarding which pencil was referred to and any additional text that seemed to illuminate the specific reference. Next, 'keyboard' was searched for within the interviews. At this stage, reviewing the richness of

the interviews retrieved suggested that searching within each interview of both series would be valuable. This realization liberated the frame of enquiry guiding the data extraction by obviating the attention to identifying and aggregating themes. As a result, the extraction process could focus solely on examining the data for relevance. While analytical choices were inevitably made when collecting data, directing those questions and decisions to which data should be extracted, and why, enabled the analysis to concentrate on understanding the meaning of the data extracted.

Having decided to review the complete *Art of Fiction* and the *Art of Nonfiction* series, data were extracted by searching the complete list of terms within each of the interviews. This was completed in chronological order from most recent (see Appendix 1 for a complete list of the interviews that were reviewed). The terms that were searched within each individual interview included:

> pencil, pen, paper, pages, notes, notebook, keys, keyboard, typewriter, type, computer, desktop, laptop, MacBook, iPad, screen, ballpoint, pad, word processor, recorder, handwritten, by hand, longhand, machine.

The content inventory resulting from searching these terms included all references to surfaces and implements made within the published interviews and, therefore, represented how experts who have written prose in English use and relate to those writerly tools.

The complete inventory of extracted content included all data deemed relevant at first read. The reasoning behind why, within the logic of this thesis, those data were extracted is discussed here. As noted, the process of extracting the data intended to ensure that the resulting inventory included all references to writing surfaces and implements. Further, those references were text gained from literary interviews. Accounting for both of those points raised the issue of how the analysis of each term would have to reconcile its literal meaning with the interviewee's intended meaning – let alone the unintended meaning. While searching the interviews and delineating references for extraction, what constituted a reference – the text relevant to a term's use – varied in both length and substance. The text necessary to make sense of each term during these initial readings did not always proceed or follow the explicit word; relevance and connections unfolded in various lengths and places. Thus, the data that were extracted and comprised the content inventory included all explicit uses of the terms searched for writing surfaces or implements – even as conveyed by a format of writing noted (e.g. longhand) – and the varied content that seemed necessary to understand initially how the term had been used in

context. For clarity, ‘context unit’ (Krippendorff, 2003) or ‘reference’ will be used hereafter to refer to an extracted term with its relevant context.

With regard to the management of the data collected, a Word document with a list of the interviews had been created to which all extracted references were added. Copying and pasting quotes into the Word document ensured that the quotes mirrored what the *Paris Review* had published. As will be detailed below, aggregating and organizing the data within a Word document also facilitated the analysis, including the reduction.

### 4.3.3 Data Analysis

Often content analyses are guided by a rigorous set of existing procedures. This study, however, took an inductive approach to the analysis. Thus, despite the necessary references to the terms for writing surfaces and implements that had been searched, all sorting was derived from the content of the samples. Iterative categorization and reviews were conducted to ensure fidelity to the data (Cohen et al., 2007). As noted, the methods detailed by Cohen, Morrison, and Manion (see Table 4.1) and tactics for generating meaning outlined by Miles and Huberman (1994) guided the analysis. In practice, these guiding principles ensured the clarity and cohesion of the findings, enhancing their applicability to stage 2.

This section proceeds by discussing how the data in the inventory were reduced to distil the findings and then how the findings were analysed for meaning. As explained, a primary reason for conducting this stage of the study was to derive areas and themes to guide data collection in stage 2. How this goal shaped the analysis also will be addressed later in the section.

#### *Data reduction*

From the complete inventory, the references extracted were reduced to include only the terms that had been searched and the text that explained and clarified the interpreted meaning. As this project is trying to identify and to understand the different ways in which certain relationships work out with different people, the inventory initially was reviewed in full to question and to affirm the extractions. Therefore, this work began by building on thinking that had been conducted while extracting the data. With those decisions in mind, an essential first step was clarifying which content should and which should not be included within a reference and why.

In addition to the literal term used, distinguishing elements of a reference could include

an explanation of a specific use, conceptions[23] of surfaces and implements or their use in general, and comments on pre-existing factors that contribute to how one understands and uses surfaces and implements. References frequently included more than one of these elements. The reductions were completed, therefore, by determining which element took priority within a given reference – or what really was being said. While conducting the reductions, the continued internalization of the content began to illuminate themes and categories within the data. Though nascent, these observations began to shape how the data were reduced.

Until a certain point, the data had been reduced to 'coded reductions' – short statements summarizing what the data said. As noted, while generating the coded reductions, which were listed in a separate document, the extracted quotes were marked simultaneously and purposefully with brief observations. Alongside the coded reductions, the observations magnified the levels of interpretation between the writers' words and the reductions – and evidence that was being lost in the latter. In isolation, the coded reductions of the writers' comments were poor representations of the data, even reduced. Coded reductions lacked the tone, diction, and structure that were essential to the findings. These realizations distilled the richness of the quotes; meaning was not just in what was said but how it was said. Thus the reductions became simply the quotes reduced to their fundamental relevance, while still using the words and sequences of the writers themselves, with the observations informing and forming their cohesion.

Eventually, all superfluous comments within the content inventory were removed and the data reduction was complete. Consecutively refining each context unit according to the relevant elements led to the substance that was analysed further to develop the findings, as will be discussed below.

### *Analysing for findings*

From the collected and reduced data, the analysis sought to develop the 'spread' of uses, relationships, and influential factors reported and experienced by the selected sample of expert writers. Though the data were and had been preserved as comments from individuals, the analysis revealed that the findings ultimately represented interpretive accounts of uses of surfaces and implements. In certain cases, however, themes emerging from the analysis of the

[23] 'Conception' is used here to cover both intended and unintended uses. The writers' conceptions include what the use intends to achieve, experiences of what the use has achieved, understandings of the intended text, and interpretations of writerly devices.

writers collectively were illuminated by individual cases. Maintaining fidelity to the data as individual reports was ensured by keeping the writers' quotes intact and, as will be revealed, incorporating those quotes to illustrate the findings. This is elaborated upon below, before outlining how the analysis was conducted.

While the nature of the data was factored throughout the extraction and reduction, certain elements also shaped what was found and how the analysis was conducted. For one, within this stage of this dissertation, the findings are as much the quotes themselves as what was found in their analysis. Many of the writers' quotes have been paraphrased and summarized within the findings presented in Chapter 5. Where manipulation might have changed the meaning of the quote or required elaboration of greater length, the writer's words are cited verbatim. Further, the data are the result of diverse interview processes with individuals who have dedicated their lives to the production of words. The content of the interviews – including the interviewers' opening comments – in substance and in form invite reflection on multiple meanings; such instances were noted clearly while conducting the analysis.

The analysis of the collected references to surfaces and implements began by focusing on specific instances of use. Uses varied among individuals and according to the surfaces and implements at hand. To understand the meaning, each reference to a specific use was examined for the following pieces of information: when the use occurred, why it was used, and the associated ways of thinking as articulated or conveyed by the writer being interviewed. Data categorized as explanations of *when* respond to the following question:

> At what point while composing – with reference to the development of a text – does the use occur?

Content extracted and categorized as *why* clarified the implicit or explicit reasons for the use. Writers themselves are the first to acknowledge that reasons for their writerly actions are not always conscious. Yet in such instances, writers still reflect on the use, often in words that convey why that use had made an impression on their thoughts. While not explicit rationales, such comments often illuminate – either in substance or form – implicit, intuitive driving factors. In tabling that information, patterns emerged within each of the categories of information, and according both to non-digital and digital surfaces and implements. These patterns were reviewed and revised recursively until categories of when and why writers use both non-digital and digital writing implements and surfaces could be defined, and the individual uses clearly allocated

within those categories.

Though not the initial intention, these preliminary stages of the analysis generated findings that usefully responded to the research questions. This illuminated the utility of the research questions as the ideal structure for framing the presentation of the findings. While the analysis of the data remained inductive, the research questions did support the analysis by informing what was being examined. At the same time, the application of the research questions was also critically considered. It became quite apparent, for example, that the phrasing of questions 1a and 1b implicitly positioned the writer as active – purposefully and consciously determining when and why the various implements and surfaces were used. As the writers themselves reveal, that is not always so. Further, many references that discussed specific instances of using a surface or implement did not include explicit reasons *why* that particular surface or implement was used. Features of a surface or implement that were referred to, for example, certainly might contribute to why a writer uses that surface or implement, without necessarily being the reason for its use. The findings are presented with meticulous attention to the scope of rationales and influences, as articulated by the writers.

Before discussing the categories that emerged, two points are worth noting. First, though distinct categories of use for both non-digital and digital tools began to emerge, the sorting indicated that uses could fit into multiple categories simultaneously. Second, while the categories are divided by non-digital and digital uses, each set of categories represents how the corresponding surfaces and implements are *primarily* used – not how they are *only* used. Some writers used digital surfaces and implements in the ways that are characteristic of using such non-digital tools and vice versa. Clarifying these conditions facilitated categorizing the references and their content, and are essential to understanding what each category represents.

Though presented and discussed in the following chapter, the findings are introduced here to explain how the analysis proceeded. Non-digital surfaces and implements essentially are used in four ways:

1. capturing prose;
2. transcribing internally crafted prose;
3. crafting the text before and alongside transcription;
4. autonomous revising.

Similarly, expert writers' uses of digital writing implements and surfaces divided into four categories of use:

1. stimulate and elicit writerly intuition;
2. engage writerly perception;
3. facilitate recursive modifications;
4. optimize and objectify.

From these findings, writerly ways of thinking were found to support uses of surfaces and implements by:

1. accommodating the nature of ideas to make them highly accessible;
2. providing frames for structuring the thinking involved in developing a text;
3. facilitating desired writerly ways of thinking for and while transcribing;
4. by facilitating desired access to effective monitoring activities.

Table 4.2. offers brief explanations of what is meant by each category of use and by the relationships delineating how writerly ways of thinking are supported by uses of surfaces and implements.

**Table 4.2. Overview of categories discussed in the findings**

| **Uses of non-digital surfaces and implements** | |
|---|---|
| Capturing prose | These uses involve transcribing the sudden consciousness of prose as soon as logistically possible |
| Transcribing internally crafted prose | Uses entail writing text that one has dwelled upon and crafted over time within one's inner thoughts |
| Crafting the text before and alongside transcription | Uses involve making notes on elements that inform or constitute aspects of a text – prior to or while drafting |
| Autonomous revising | Uses to mark changes and suggestions on a complete draft after it has been composed |
| **Uses of digital surfaces and implements** | |
| Stimulate and elicit writerly intuition | The literal experience of the use extracts automatic or non-conscious thinking into written text |
| Engage writerly perception | Ways of seeing, hearing, and feeling are focused through uses in ways conducive to writing |
| Facilitate recursive modifications | Making surface changes while transcribing becomes easier and more frequent |
| Optimize and objectify | These uses make aspects of writing more efficient and impartial |
| **How uses of surfaces and implements support writerly ways of thinking** | |
| Accommodating the nature of ideas to make them highly accessible | Uses respond as necessary to ideas to make them visual and to reduce mental loads |
| Providing frames for structuring the thinking involved in developing a text | Uses offer ways of internally and externally organizing thinking |
| Facilitating desired writerly ways of thinking for and | Uses enable access to ways of thinking conducive to |

| | |
|---|---|
| while transcribing | the transcription activity |
| Facilitating desired access to effective monitoring activities | Uses allow writers to calibrate the activity of their metacognition while and after writing a draft |

After looking at the individual uses, the analysis focused on enduring or pre-existing contextual factors from the perspective of the writer. The analysis proceeded by examining the data for ways of perceiving and acting (or moving), then ways of thinking and next repeated experiences. The findings are presented in three sections. The first seeks to explain factors that shape writers' ways of seeing, hearing, and feeling, relating to time and space, and executing bodily and haptic activity – all when using surfaces and implements. Turning to the ways writers think while writing and about writing illuminated influential and enduring writerly orientations, impressions, and conceptions. Having examined the formative influences on writers' perceptions and conceptions that shape their writerly tool use, the analysis studied the writers' characteristic ways of using the tools and, specifically, the effort and awareness involved. This led to two discussions: one on intuitive and automatic uses of surfaces and implements and another on those that are effortful and purposeful.

As discussed, developing and challenging the findings throughout the analysis entailed many decisions. The analysis of these data, however, did not conclude once the findings had been identified and confirmed. Though the data had been analysed with attention to the eventual presentation of the findings, actually writing the resulting insights raised further questions and considerations. For one, the messiness of the writing process and the array of thoughts that it entails are given structure for the purposes of clarity and communications in Chapter 5. This architecture had to be constructed carefully so as not to obscure the substance of the findings. The second key issue confronted while writing the findings was the need for a precise explanation of 'pre-existing or enduring contextual factors'. Though such factors were easily identified when analysing the data, what was meant by the notion and what distinguished these influences remained more tacit. Writing the findings clarified that pre-existing factors and experiences were customary ways of behaving, perceiving, and thinking, and the memories of experiences that involved those tendencies. Such factors were discussed and explained as reoccurring or not unique to a specific instance of use. Chapter 5 presents these findings along with those of the entire analysis outlined in this section.

## 4.4 Stage 2: In-depth Qualitative Cases of Student Writers

To address the technological and pedagogical dimensions of the research questions, stage 2 sought in-depth, qualitative data on students' uses of writing surfaces and implements, and the relevant pre-existing factors. This objective entails two goals: 1) to address the study's overarching aim and goals with reference to contemporary *student* writers (see Section 3.1); and 2) to collect rich explanations of and for diverse uses of digital implements and surfaces. Turning the focus to student writers aims to enhance the rigour of the resulting findings, particularly for guiding pedagogy. This approach follows a tradition of writing research that seeks to address writing instruction, by developing understandings of the targeted writing practices and explanations of the cognitive processes involved (Nystrand, 2006). Guided by both objectives, findings from stage 2 will enhance the pedagogical and technological understandings in the study's concluding discussion of the research questions.

In alignment with stage 1 of the study, stage 2 adopted the techniques employed by the *Paris Review*. The data collection methods, therefore, were determined with the students' input so that the format appropriately captured each student, according to the student. By contrast to the *Paris Review*, however, data were collected with a particular focus: that of the study's research questions. Even so, applying the practices of the *Paris Review* demonstrably enriches the accuracy and authenticity of the data collected[24]. Throughout stage 2, various data collection methods were used to capture the students' writing practices and understandings; methods included reflective email responses, in-depth semi-structured interviews in person, and photographs. These methods reflect both the nature of the data sought and the study's concern for its own practical implications: instructional applications. Further, the methods possess characteristics of qualitative writing research that have resulted in contributions to our understanding of writing, including the ability to analyse across settings and a commitment to detailed and nuanced language (Schultz, 2006).

### 4.4.1 Population and Sample

The population of interest for this stage of the study included students who use technology to compose written assignments and are learning to enhance their composition of critical – argumentative or expository – works of semantic cohesion (Halliday & Hasan, 1976). This leads

[24] The reasons for this are outlined on page 51.

to three distinct characteristics that were sought in each case: 1) frequent use of technology; 2) advanced learning of writing; and 3) regular immersion in structured learning contexts (i.e. regular lecture or seminar attendance). A willingness, bordering on a keenness, to commit a significant amount of time and to consider intuitive and non-conscious behaviours and mental activity was also critical. Further, while not imperative, a diversity of majors (areas of study) among the participants was desired in order to mirror the variety of backgrounds and interests that characterized those interviewed by the *Paris Review*. Owing primarily to the nature of the data sought, convenience sampling was used to recruit seven students from Columbia University in New York City, where a freshman-year writing course is mandatory and technology culture thrives in the surrounding urban landscape.

Roughly one month in advance of the desired timeframe for the initial data collection method, seven students were contacted via email. Very limited information about the study was included in the initial contact; each student received a participant information letter, which is included in the Appendix. The initial email did, however, call attention to the time commitment as outlined in the information letter. Owing to the in-depth nature of the study, a sample of roughly five students was sought. Table 4.3 offers very brief information about the five participants who committed themselves to and completed the data collection. As noted in Table 4.3, one participant, Emily, was studying abroad in Australia throughout the data collection process. When recruiting participants, students studying abroad had been considered as the *Paris Review* had not selected writers by their location; rather, an underlying premise of its interview approach was to accommodate the writer on whatever grounds that might entail. When assessing whether to proceed in working with Emily, the potential challenges were evaluated though outweighed by the fact that Emily strongly satisfied all of the characteristics desired: she owns three devices on which she composes text and her final exams abroad were all to be essays.

**Table 4.3. Brief information about the research participants**

| Student | Year | Major | Location |
|---|---|---|---|
| Amy | Junior | Creative writing and Gender studies *(double major)* | NYC |
| Matt | Junior | Economics | NYC |
| Zoe | Senior | Education | NYC |
| Uday | Junior | Computer science entrepreneurship *(piloting)* | NYC |
| Emily | Junior | History | Australia |

### 4.4.2 Data Collection Methods and Timing

In line with the study's interpretive methodology, data from each research participant were collected via a sequence of diverse qualitative methods. Collectively, the methods included:

1. a set of questions designed to elicit reflective and descriptive responses, sent via email;
2. in-person, semi-structured in-depth interviews;
3. semi-structured in-depth interviews via FaceTime;
4. semi-structured in-depth interviews via iMessage;
5. photographs taken by the participants.

**Table 4.4. Overview of data collection methods**

| Type of methods and tool used | Nature of communication | Nature of data collected | |
|---|---|---|---|
| Reflective and descriptive email questionnaires | Asynchronous | Text | Field notes |
| In-person, semi-structured in-depth interviews | Synchronous | Observations, audio recordings, and their transcriptions | |
| Semi-structured in-depth interviews via FaceTime | Synchronous | Observations, audio recordings, and their transcriptions | |
| Semi-structured in-depth interviews via iMessage | Asynchronous | Text | |
| Photographs | Asynchronous | Visual images and captions | |

Table 4.4 delineates the basic characteristics of each. Not all methods, however, were used with each participant. Which data collection methods were implemented for each student and when are outlined in Table 4.5 From the methods used, several forms of data were collected: 1) email correspondences; 2) audio recordings; 3) transcripts; 4) observations from in-depth, in-person, and FaceTime interviews; 5) transcripts of iMessage conversations; 6) photographs taken; 7) captions provided by the research participants; 8) continuous field notes. Data collection with each research participant was conducted over roughly two months and, for consistency, the time in between each particular data collection method was similar for each student. Further information about each of these methods and their application follows below.

**Table 4.5. Timeline for and methods of collecting data from students**

<table>
<tr><th>Student</th><th>Week 1</th><th>Week 3</th><th>Week 5</th><th>Week 7</th><th>Weeks 8–9</th><th>Throughout</th></tr>
<tr><td>Amy</td><td rowspan="5">Reflective and descriptive email response</td><td rowspan="4">In-person, semi-structured in-depth interviews</td><td rowspan="5">Reflective and descriptive email response</td><td>Reflective and descriptive email response</td><td rowspan="3">In-person, in-depth semi-structured interview</td><td rowspan="5">Photographs</td></tr>
<tr><td>Matt</td><td rowspan="4">Semi-structured in-depth interview via iMessage</td></tr>
<tr><td>Zoe</td></tr>
<tr><td>Uday</td></tr>
<tr><td>Emily</td><td>FaceTime in-depth semi-structured interview</td><td>In-depth semi-structured interview via iMessage</td></tr>
</table>

### *Reflective and descriptive email questionnaires*

Email was used to administer three different rounds of questions. All five participants were asked to complete the first round and opted to use email to reply to round 2's questions; one participant asked to reply to questions via email for a third time. In line with the interpretive approach and reminiscent of the PR interviews, the asynchronous nature of email gave students the ability to live with the questions and then to craft their responses over a period of time before hitting Send. Additional reasons for using email included its speed, economy (no cost), regular use by participants, and elimination of interviewer bias (Phellas et al., 2012). The absence of my presence when research participants receive, interpret, and respond to the emails rendered their clarity critical.

*First email:* To inform the data collection, each student was asked to respond to a series of questions that would elicit a foundational writerly biography. The questions (see Table 4.6) were developed to elicit background information and to encourage reflection on and observation of understandings and experiences that would be revisited in greater detail and may not have been explored consciously or in depth prior to participation in this study. The structure of the questions, moving progressively from memories and personal beliefs to recollections of the process or activity of writing a paper, also sought to engage and to stimulate the students' thinking and individuality (i.e. foster the notion that there are no wrong answers) without intimidating them. Once drafted, the questions were piloted to ensure the accuracy of their intended interpretation and then revised as necessary. The questions were included within the body of an email and students were encouraged to respond within roughly ten days in the format

that worked best for them. As will be explained below, the questions were purposefully administered in the third week of August. Response time varied, and some students entered their answers in the body of the email and others pasted the questions into a Word document. All responses were saved offline.

**Table 4.6. First email: writerly biographical questionnaire**

1. What can you remember about how you learned to write? *Please feel free to cite all formative formal and informal learning experiences, teachers, writing practices or exercises and written texts that have been influential.*
2. What do you enjoy about academic writing?
3. Which aspects of academic writing come naturally to you?
4. Have your feelings about academic writing changed since you started college?
5. Which aspects of academic writing are most challenging for you?
6. Do you have any wisdom to impart about the craft of writing?

*When you are working on an essay or written assignment …*

7. Describe what your process consists of, in detail.
8. Do you have your own writing routine or writing habits? If so, please share.
9. How long have you approached writing this way?
10. Do you edit much?
11. How do you edit or revise?
12. Do you write longhand normally, or on a computer, or both?
13. If you use both formats throughout the writing process, when do you use one versus the other and why?
14. Are you particular about what kind of surfaces and implements you use?

*Second email:* Following the face-to-face interview, all five of the students agreed to respond to reflective and descriptive questions via email. The preliminary review of the data collected through the initial email and the interviews suggested that the each student held conscious and consistent understandings of their writing tools and practices and clearly had established their understanding of the terms essential to the study's research questions. Concrete responses to the research questions, however, were not being collected through questions and questioning that circumnavigated the enquiries. Thus, a little over a week after their interviews, the students simultaneously were emailed the following questions:

1. When and why do you use non-digital writing implements and surfaces?
2. When and why do you use digital writing implements and surfaces?

Within the email, students were instructed as follows:

> Please take some time/a few days to observe and to contemplate your transcription of written language (e.g. notes, creative writing, academic writing, etc.) with reference to each question. Your responses, however, should not be limited to the coming five

days. The time merely aims to give you the space for you to reflect and your thoughts to develop, so that your responses are as accurate and descriptive as possible.

As indicated, responses were sought roughly one week after the email was sent. Section 4.4.3 details how this stage, its questions, and timing illuminated that data that had been collected and enhanced the subsequent collection.

*Third email:* For the fourth round of data collection, conducted during week 7, a series of questions was developed for each research participant. As will be discussed below, four students suggested responding to questions via iMessage. However, one research participant, Amy, asked to use using email for receiving her fourth round of questions and submitting responses. The questions had been typed into a Word document that was emailed as an attachment. As with earlier emails with questions, Amy was advised to input and to return her responses in the way that made most sense to her. The email delivering the attachment also highlighted one question that required Amy to observe, for a few days, a certain practice of hers that had been discussed in prior rounds. This sought to ensure that Amy would attend to the particular practice as attachments are not guaranteed to be viewed prior to being addressed, and to elicit information about those processes as they occurred naturally.

***In-person, semi-structured in-depth interviews***

In-person, semi-structured in-depth interviews were conducted roughly a week after receipt of the writerly biographical questionnaires and, in four cases, also as the concluding data collection method. The first round of interviews was purposefully scheduled during the first week of school and guided by questions drawn from responses to writerly biographies. Administering the writerly background questionnaire in August had allowed for sufficient time for a preliminary analysis of the responses. The resulting questions, unique to each participant, had three aims:

1. to review the content that had been submitted via email;
2. to clarify incongruities;
3. to begin to capture – directly and indirectly – their writerly ways of thinking and uses of surfaces and implements.

These three objectives also shaped the questions prepared and posed for the concluding round. The concluding round, however, was able to draw on far greater data and thus had additional goals. These included clarifying confusing accounts, returning to points that students had made

and yet could not explain explicitly, and confirming the use of novel or seemingly situational practices.

Both the initial round and the concluding round of in-person interviews were conducted in locations chosen by the participants. While public, these locations were quiet, informal, and familiar to the students, which contributed to a fluid rapport in each scenario. The conversations were recorded using the iPhone voice-recording application, transferred to my computer and saved offline. The semi-structured nature of the questioning in the early round assisted in constructing a base from which the subsequent data collection methods could explore. Collectively, the semi-structured nature of the two rounds of interviews assisted in embedding a relative consistency among the topics covered inter and intra participants.

***Semi-structured, in-depth interview via FaceTime***

As noted, Emily participated in the research in Australia; she was in the midst of her semester abroad programme. She suggested using FaceTime as her application of choice for conducting a face-to-face interview. Presented to her following the writerly biography, the questions posed to Emily were guided by the same three aims that informed the first round of in-person interviews with students not studying abroad. For further alignment with the in-person interviews, the primary data collected and analysed from the FaceTime interview were also the audio recordings, transcribed into text. Thus, what will be discussed here are elements unique to the application of video calling over the internet as a face-to-face interview data collection method, which were realized within this study: factors involved in conducting the interview, and representativeness (O'Connor et al., 2008).

As noted, the interview was held over FaceTime. Among video-communication platforms, FaceTime syncs across Apple devices (e.g. MacBooks, iPads, and iPhones) with simple and consistent aesthetics, no need to 'log in' (i.e. no need to remember a password), and with no cost when used over a wireless signal. Within each Apple device, one may choose to be reached for messages via both phone numbers and Apple IDs, ensuring that incoming calls – whether to a phone number or an Apple ID – may be answered on any of the devices. As will be elaborated upon below, this applies to iMessage as well. The ease of use and synchronization across devices enhances user engagement with the application. As with other video-calling platforms, the faces of both callers appear on the screen with that of the audience in a larger window. Thus, when speaking with Emily, her face dominated the screen and my face appeared

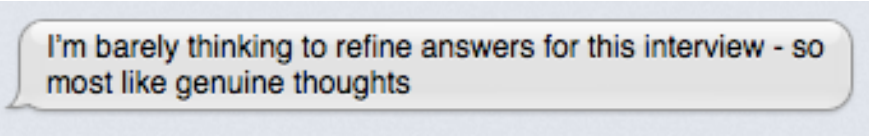
in a small box in the bottom left corner. Inevitably, in such conditions, certain bodily cues that may engender trust and facilitate the fluidity of the dialogue are lost (O'Connor et al., 2008). Fortunately, those were not issues with Emily: following her arrival in Australia, she began using FaceTime constantly to communicate with diverse audiences.

Using web-based video calling presented three challenges that were monitored during the FaceTime session and by systematically triangulating the resulting data with the additional material collected. First, during the conversation, the wireless connection broke a couple of times, interrupting the dialogue. This did not explicitly result in any thoughts being lost and Emily noted that she had come to find connection disruptions inevitable and not disruptive since she began using the platform frequently while abroad. Second, while an interest when conducting any face-to-face interview, the authenticity and accuracy of participation raised a particular concern. Being divided by a screen, along with being able to see oneself while talking to another person, is not a natural feature of in-person communication. However, Emily's explicit awareness of these differences along with the openness, comfort, and fluidity of her responses suggested that the medium did not distort the meaning. Third, though representativeness is highlighted as a challenge of online interviewing, this research does not seek to make generalizations, and focuses on technology behaviours rendering the internet a 'most suitable methodological tool' (O'Connor et al., 2008, p. 277).

***In-depth semi-structured interviews via iMessage***

For the fourth round of data collection with four students and the fifth round with one student, the participants chose to receive and to reply to questions via iMessage. Having discussed the utility and application of in-depth semi-structured interviews, this section focuses on the unique, relevant features of iMessage. As noted above, iMessage is the Apple application for sending, receiving, and managing multi-media messages, including text messages, and may be accessed and synced across devices. Research finds that the popularity of texting among teenagers continues to increase, with the majority adopting it as their preferred mode of communication (Porath, 2011). In 2012, teenagers were found to send, on average, roughly sixty texts each day (Lenhart, 2012). Medical research (Kew, 2010) and research into the study of daily life (Connor & Lehman, 2012) highlights the efficiency and efficacy of using text messaging for collecting information. This, in light of the sample profile and nature of the data sought, suggested that iMessage would be a fruitful tool for collecting data. That was soon confirmed. As one research

participant spontaneously noted during an iMessage conversation:




Another research participant continued to iterate that she was 'more likely to say what [she] actually think[s]' via text. Thus, iMessage proved integral to accessing and exploring students' genuine and unrefined thoughts. Owing to the interactive nature of iMessage, participants were asked exploratory questions related to the observations and their own writerly uses of surfaces and implements: what characterizes them, which factors influence, *inter alia*.

***Photographs taken by the participants***

Towards the end of the first in-person, semi-structured in-depth interview, students asked whether, and if so how, their writing surfaces and implements might be captured visually. All agreed that taking spontaneous photographs with their phones would be both convenient and accurate. To support this, each student was emailed following their interview with instructions for downloading and using Collect: a well-reviewed and tested application for keeping a photo journal. An example of how Collect records an image and the corresponding text is offered in Image 1. Though it had been discussed, the email iterated what to photograph; students were advised to use Collect to take pictures of what they use to write, their writing space, and anything else that is formative for their writing experience. As the app allows one to write a brief caption for each photo, students were asked to note briefly how the image relates to their writing. Though the students determined when, where, and what they photographed, gentle enquiries throughout the data collection sought to ensure that students were mindful of taking the pictures.

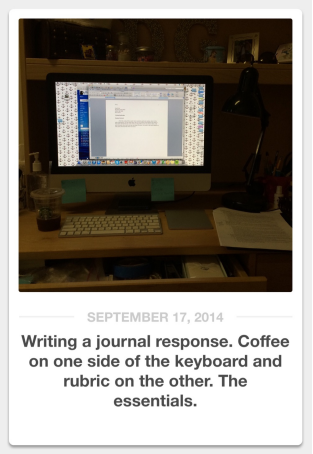



**Image 1: Screenshot of photo and entry collected via the Collect app.**

Three students used Collect and the other two simply decided to take and to save pictures through the Apple Camera and Photo applications. In the latter scenario, students sent the picture

via iMessage with a text caption (see Image 2). Students who used Collect also sent their images via iMessage.

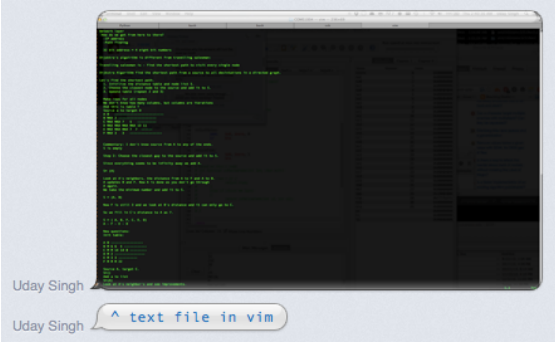



**Image 2: Screenshot of photo and entry collected via iCamera and iPhoto.**

Before turning to the analysis of the data, a feature of the above that has yet to be discussed, its potential ability to explore intuitive uses in depth, is introduced here. By interacting with the students over time, in diverse contexts, and through different formats, extensive data on their practices in process were collected. The emailing and texting, in particular, allowed the students to reflect on and to report on what was occurring when they were writing for assignments. Further, interacting with students through devices that they use for their writing assignments allowed them to draw on visual and material stimuli that interact with and constitute how they relate to their surfaces and implements.

### 4.4.3 Data Analysis

Like stage 1, stage 2 took an inductive approach to the analysis, guided by the methods detailed by Cohen et al. (2007) [see Table 4.6] and Miles and Huberman (1994). Thus, all sorting and categorization were similarly derived from the collected material, through successive analyses and reviews that ensured fidelity to the data (Cohen et al., 2007). This approach also sought to generate findings in alignment with the clarity and cohesion of those from stage 1. Accordingly, much of the reasoning clarified and applied in stage 1 was extended to stage 2. Throughout the two following subsections, references are made to stage 1 where appropriate so as not to be repetitive. The section proceeds in two parts to discuss: 1) how the student data were collated and reduced to extract the findings before 2) analysing them for meaning.

#### *Collating and reducing the data*

As outlined in Table 4.4, several forms of data were collected: 1) email correspondences; 2) audio-recordings; 3) transcripts and 4) observations from in-depth, in-person, and FaceTime interviews; 5) transcripts of iMessage conversations; 6) photographs taken and 7) captions provided by the research participants; and 8) continuous field notes. Though the reduction and collation entailed degrees of interpretation and analysis, no purposeful sorting or categorizing

occurred. Yet, owing to the study design, one key distinguishing factor endured and continued to structure the collation and reduction, and eventually, the analysis: the individual. Throughout the collection methods, all data were dealt with student by student – until later stages of the analysis, which are discussed below.

In addition to accounting for the individual, the diverse forms of data were incorporated throughout the reduction, collation and analysis. Though the nature of the data collected for each research participant differed (see Table 4.5), all data were transcribed into written text for the purposes of the entire analysis process: audio-recordings were transcribed and meaning in the images was documented through the students' captions and field notes, in written language. Once transcribed, the spoken words of the students were preserved throughout the reduction and analysis as quotes. The subsequent section discusses how, as with the expert writers, the students' words proved consistent with the findings and therefore have been woven in throughout Chapter 6. While Chapter 6 also includes pictures taken by the participants, those images merely offer visuals to reinforce the findings presented (i.e. they are data collected and not findings themselves).

Having collated the data, transcribed as written language, reduction was conducted to include all comments and text that either related to or illuminated the students' uses of surfaces or implements, or both, and their writerly ways of thinking. This was guided by decisions and insights gained when reducing the data from the expert writers (see page 59). For one, the elements identified as distinguishing a meaningful reference were applied when reducing the student data. During that process, as was realized with the expert writers, further reductions – at a certain point – of the students' words altered their meaning. Thus, the reductions for this stage of the study also included quotes to which additional modifications would have altered their essence. With the expert writers, a key reason for preserving their words was that how something was said contributed to its meaning. This, however, was not as relevant with the student writers. With them, voice and tone were important but the data collection had sought to mitigate ambiguity and to elicit authentic, descriptive accounts.

The students' words are preserved to present the complete substance of their rich explanations. Like the *Paris Review*, the field research collected data through diverse methods and processes. By contrast, the research participants are not expert writers; they are students of Columbia University and bound by a different collective identity, with distinct norms and

behaviours. This, however, did not reduce the importance of reflecting on the content of their words. What was different in doing so was how multiple meanings emerged – not through literary analyses, but over time through, for example, the different ways, contexts and formats in which tool uses were discussed. Time, the different contexts and different formats, proved integral to allowing the students both to realize their full range of uses and to gain deeper insights into those uses.

***Analysing for findings***

As noted, stage 2 sets out to explore the research questions with students who grew up with technology and, while participating in this study, were enrolled at a university; the intention being to consider the enquiries with particular regard to their technological and pedagogical dimensions. Though these objectives informed the selection of the sample and the methods used, they did not affect how the data were analysed. Rather, the analysis of the student data employed the same theoretical framework that had been applied to analyse the data from the expert writers: the study's research questions. From that framework, iterative categorization and sorting were conducted. To ensure continuity among the individual cases, the same series of processes was performed for each student. This section continues by detailing the stages of analysis that were conducted for all of the students and indicating, as necessary, any exceptions or differences.

First, the analysis sought to determine the range of uses of surfaces and implements, of writerly ways of thinking, and of relevant pre-existing factors and experiences. With the reduced data saved in a Word document, a copy of that document was made from which the content could be copied and pasted into an Excel spreadsheet. This initial sorting sought to categorize the data into three overarching groups: digital uses, non-digital uses, and contextual factors. Using the copy of the Word document and the spreadsheet ensured that the data were maintained in a form untouched throughout the copying and pasting, which could be used to affirm fidelity to the data. In addition, copying and pasting in digital documents allowed for the sorting of content into more than one category, where necessary, as was done when analysing the content from the *Paris Reviews*.

Within each of the digital and non-digital categories, the meaning of a given use was examined according to the corresponding processes detailed in Section 4.3.3: Analysing for Findings. This led to the sorting of the references into 1) the use and when it occurs, 2) the reason for the use, and 3) the corresponding ways of thinking. Yet, as noted throughout the

discussion of the data collection, the students – like the expert writers – did not always articulate why they had used a surface or implement, or both. The number of such instances, however, was far fewer owing to the opportunity for probing and follow-up questioning with the students. Even still, coding reasons throughout the data revealed that students occasionally did not have explanations or even any suggestions that they were willing to propose. With each student, to varying degrees, this occurred more frequently with regard to their uses of digital surfaces and implements. Another realization in delineating the uses and reasons was that a number of the students' writerly tool practices are quite tentative and temporary and, thus, not inevitably characteristic of the individual. Both these uses – and those lacking explicit explanations – are presented within the findings; the realizations will be explored further in Chapter 7, the discussion chapter.

Before identifying and refining the themes, the data of contextual factors were analysed. This stage drew on the understanding of pre-existing factors and experiences that had been clarified to analyse the data from the expert writers, as explained in Section 4.3.3: 'customary ways of behaving, perceiving and thinking, and the memories of experiences that involved those tendencies'. Tables 4.6 to 4.8 detail the collective findings on relevant pre-existing factors and experiences. Those findings are contextualized and incorporated in Chapter 6 to convey the diverse combinations and ways in which these elements are realized individually. With reference to those from the expert writers, the findings on pre-existing factors and experiences that influence students' uses of surfaces and implements raise many points worth discussing. Those will be explored in Chapter 7. One point, however, is worth noting here. Whereas the expert writers are defined by their ability to write well, the students are not. Accordingly, certain pre-existing factors and experiences shared by the students were not necessarily productive for writing, nor were the students either explicitly aware of or concerned about such implications. Tables 4.6 to 4.8 do not preclude potentially negative factors and experiences.

As shown in Table 4.7, pre-existing factors and experiences that shape what and how students perceive and act while using their surfaces and implements were divided into those that shape how and what the students see, hear and feel; how they perceive time and space; and those that are involved in students' haptic and gross motor activity, separately.

**Table 4.7. Factors that shape how students perceive and act when using surfaces and implements**

| **Writerly perception** |
|---|

*Factors that shape how and what the students see, hear, and feel while writing:*
- Surface size
- Typeface: values and expectations attached to different visuals
- Typeface: implications of visual appearance for cognitive reception and interaction
- Synchronization of devices: ability to work on different hardware and applications
- Visual neatness of the process
- Tangibility of the surfaces and implements
- Tactile experience of keyboards
- Design of tools
- Muscle memory
- Self-consciousness
- Ability to focus
- Productivity

*Factors that shape time and space perception while writing:*
- Social needs (e.g. people around, continuing communications)
- Individual ideation: self-awareness of how one's own ideas develop over/in time
- Deadlines and senses of urgency
- Efficiency of devices and applications, and ability to maximize efficiency
- Ability to programme shortcuts for tasks
- Energy required of different writerly tasks and practices
- Online habits
- Where one writes and why
- Attitudes towards waste and inefficiency
- Background noise or music – and understandings of its effects
- Desire for temporal and spatial flexibility

**Writerly action and behaviours**

*Factors involved in haptic activity*
- Early handwriting instruction
- Early exposure to keyboards
- Speed of typing across devices
- Early writing tools
- Early typing memories
- Mental and physical effects of the writing process: fatigue
- Digital communication behaviours and preferences, including email and texting

*Factors involved in gross motor activity*
- Physical comfort
- Dislike of the writing process induces fatigue
- Pacing while editing
- General daily activity as opportunities for brainstorming

Presented in Table 4.8, the orientations that shape how students use their surfaces and implements are also threaded throughout Chapter 6, revealing their continual and diverse realizations by the students, individually and collectively.

**Table 4.8. Orientations that shape or determine the students' writerly tool use**

| **Writerly orientations** |
| --- |
| Mental self-control and self-awareness |
| Self-efficacy: clear work habits, priorities, confidence in abilities (e.g. memory), and processes |

Self-consciousness – as disruptive
Preferred mode and medium of expression
Enjoyment of, interest in, satisfaction with the task
Motivation and having reasons for writing
Views on writing as innate or a skill to be developed (i.e. comes easily to some and not others)
Information processing: hunger for, time management and organization of
Privacy management: online presence, digital communications, storage of materials
Ideation: hunger to develop one's own ideas

Like their writerly orientations, students' writerly impressions and conceptions weave through their uses of surfaces and implements in diverse ways, with various results. Table 4.9 presents impressions and conceptions that the students held about their own experiences, abilities, and knowledge, and those regarding social influences and technology.

**Table 4.9. Writerly impressions and conceptions**

**One's own language development: speaking, reading and writing**
Speaking: when, which languages, emphasis in formal instruction, values embedded in language (i.e. sophistication and Mandarin)
Writing: proclivity, ability, what one learns about writing and the writing process in high school and in college – and how
Reading
**One's own communication abilities and behaviours**
Ability to communicate complex ideas clearly
Confidence in and comfort with …
How one sounds (e.g. sophisticated)
As a function of tool (e.g. laptop keyboard or phone keyboard) and/or medium (e.g. email or text)
As a function of instruction
**Personal formal education experiences (**including)
Early writing memories
Extent of exposure to deep reading and good writing
Grammar: when and how one learns (i.e. after letters and words, or in high school), quality and importance of
Writing activities and types: free-writing, reflective, analytical/structured
Writing as a tool for learning and thinking
Active monitoring: attention to internal production and revision
Emphasis on writing for tests
Emphasis on writing process (translation of thought, correct grammar, etc.)
Emphasis on the written outcome
Subjectivity of paper evaluation and grading
Classes as writing workshops: from exploratory/unstructured to critical/diagnostic
Learning of opportunities for creativity within familiar boundaries
Raising big questions
**Writerly knowledge and understandings – not necessarily developed through instruction** (of)
Language use, challenges, and aspirations (and expectations throughout)
How language operates
Grammar and vocabulary
Writing conventions and essay structures in general, and for different disciplines
Different genres and their different goals
Authorial voice and voices in the written text
Formal elements of a text
Theses: purpose, utility, and aims

Frameworks and structure as guidance
Essay objectives
Editing directives / intentions of editing (which require purposeful attention v. become automatic)
Understanding of strong academic writing: fundamental writing skills and being able to articulate and defend an argument

**Social factors – inside and outside the classroom**)

*From home (including)*
To/for whom one wrote as a child
Parental views of education
Parental editing support
From peers
Confidence through experience and authority

*From writing teachers and professors (including their)*
Ability to motivate, to inspire, and to encourage
Priorities
Backgrounds
Value placed on critical thinking
Feedback

**Factors related to technology**
Early memories of technology
General views and beliefs about the utility and potential of technology
Digital communications: involving different mindsets, formalities, and expectations
Digital information source(s): which are preferred and why
Digital information (including communications and work): management and organization
Experiences of how thoughts and thinking are shaped by digital information (i.e. increasing hunger, outpacing)
Personalized uses of different devices (e.g. iPad only for Netflix)
Attachment to devices, particularly iPhones
Views towards text prompters
Views of the communication purposes of technology
Design and efficiency benefits and issues
Purpose of formats (i.e. texts) and substance of content
Format shaping behaviours and content

Detailing the scope of pre-existing factors and experiences facilitated further analysis of the instances of use and explanations. When, for example, a certain writerly tool use seemed to be temporary, findings on context assisted in making sense of that use by providing links to writerly aspects that *are* characteristic of the individual. With a comprehensive understanding of the students as writers, the non-digital and digital data were examined separately for overarching themes. Through iterative sorting and refining of categories, clear groupings eventually became apparent for each student's non-digital and digital tool use. Nonetheless, certain instances of use continued to fit into multiple categories simultaneously – across both the different formats and the identified overarching uses.

Instead of introducing them here, the key themes specific to each student are tabled at the beginning of each case in Chapter 6. These 'summary tables' include when and why the student

primarily uses 1) non-digital and 2) digital surfaces and implements, and 3) how those uses of surfaces and implements ultimately support writerly ways of thinking. Isolated at the onset of each case, the tables seek to prepare the reader, and to enable comparisons to be made between students, which will be explored in Chapter 7. Following the summary table, each case is further introduced through background relevant to the subsequent subsections on, respectively, uses of non-digital and digital surfaces and implements. Throughout each case, the participant's words are quoted verbatim where modifications might have altered the meaning. To illustrate the findings, images submitted by the students are also included within the appropriate case.

## 4.5 Ethical Considerations

In its design and implementation, neither stage 1 nor stage 2 posed any risk to participants. The study design did, however, raise certain ethical issues for both stages that were addressed. In stage 1, accessing publicly available material for a content analysis raised the issues of plagiarism, as well as of interpreting and using the words of others for unintended purposes (Krippendorff, 2003). These issues were addressed through appropriate referencing and the nature and treatment of the data. Throughout the implementation and presentation of stage 1, the data were summarized, paraphrased, and cited, always with reference to the proper source (Elder et al., 2010). When extracting and analysing content from the *Paris Review*, interpretations of meaning were grounded not only by the methodological cohesion, but also through the context of the entire interview (Sixsmith & Murray, 2001) as approved by its interviewee: the writer (Garner, 2010). Thus, the data being analysed were the inherent and contextualized words of the writers, as intended.

By involving human participants (CUREC, 2014), stage 2 raised issues concerning 1) the selection and treatment of human individuals as research participants and 2) the use of digital media to collect private data (Howe & Moses, 1999). Though stage 2 sought to recruit university students, it specifically recruited those in their third, or even fourth, year; not 'children' (CUREC, 2014). To ensure that participants were not under the age of 18, students being recruited first were asked to confirm their age. Those satisfying the characteristics sought in a research participant were emailed a letter of introduction and participant information form in line with the University of Oxford's protocols for human participants. Voluntary participation was confirmed via email and, again, in person with all individuals being given the explicit opportunity to decline to participate and to withdraw at any point. Further, the students were

informed that their participation would be confidential at all stages.

In addition to guiding the selection and treatment of the students as research participants, ethical standards informed the use of digital media for collecting and storing data throughout stage 2. The key ethical considerations included ensuring the confidentiality and security of data across the platforms. For email, online video calling, instant messaging, and a photo journal application, password-protected accounts were used at all times. Once collection was completed, all data were downloaded and stored securely offline, erased from the online platforms used, and backed up on an external drive. Thus, the data remained confidential and secure throughout the study.

## 4.6 Authenticity of the Findings

The quality of this study is driven by its critical and transparent design and execution, bound by a theoretically cohesive framework. Accordingly, the authenticity of the findings (Lincoln & Guba, 1986) is captured by the study's conceptualization and illustrated further by its implementation, as outlined above. Presenting the findings from the study, Chapters 5 and 6 detail the insights and meaning resulting from the collection and analysis of expert and student writers' self-reports on writerly tool use. The use of 'self-reports', however, may be misleading. Both the expert writers and the student writers were interpreting, rather than reporting (Tomlinson, 1984), their processes. Interpretation continued to be necessary throughout the collation, reduction, and analysis of the data. Thus, the application of the interpretive paradigm detailed in Section 4.1.2 reinforced fidelity to the data and is integral to the authenticity of the findings: how they were developed, what they are, and what they represent. The presentation of participants' views in their own voices to provide evidence of the interpretations comprising the findings further illustrates the study's fidelity to the data (Fossey et al., 2002). Nonetheless, from both stages of the study, the authenticity of the findings is inevitably challenged by two additional elements: 1) the nature of the research participation, and 2) recall and response bias. Having anticipated and assessed these issues, the study design addressed them, and thereby minimized their effects on the authenticity of the findings, in the ways discussed below.

I make a complete disclosure of my relationship to the context (Tomlinson, 1984). One of my sisters is currently an undergraduate at Columbia College, which is also my alma mater. Though the individuals recruited were not well known to me prior to this study, their motivations for participating in the study may have been shaped by social relationships to some extent,

although there was no evidence to suggest that this compromised their openness as informants in any way. They also had the opportunity to withdraw at any point should the experience prove uncomfortable. In using convenience sampling guided by the outlined criteria, ultimately my familiarity with being a Columbia student and with contemporary issues on campus proved beneficial for interacting with the students. Understanding references to core courses and locations, as well as experience of institutional norms and expectations, facilitated knowing when and were to probe further, as well as determining which context was truly meaningful.

An additional potential challenge to the authenticity of the findings, from both parts of the study, is recall and response bias. Asking individuals about past behavioural activity assumes a willingness on their part to discuss this activity as well as an accurate memory of the events (Breakwell et al., 2006). The *Paris Review* accounts for this through its unique process and transparency: an interview is not published until the interviewee confirms that the transcript is an accurate reflection of their understanding. To legitimize their credibility and that of the findings (Cutcliffe & McKenna, 1999), all interviews published by the *Paris Review* have been verified by the interviewees. Part 2 of the study design accounts for recall and response bias by triangulating data collected several times, through interleaved synchronous and asynchronous methods and both in person and via digital devices. Recent research suggests that participants' responses are more honest when delivered to a digital device than when delivered to an interviewer in-person (Phellas et al., 2012). Interviewer bias was accordingly reduced through the use of email, as noted, in two rounds of questions as each participant received the same questions in the same format. Intermixing face-to-face and digital methods throughout the entire process also sought to enhance the resulting authenticity of the data and the iterative triangulation.

## Chapter 5: The Interviews from the *Paris Review*

> Interviewer. *The* Paris Review *has one quintessential question, which it has asked everybody from William Faulkner to Ernest Hemingway. What is the implement that you write with?*
> T. Coraghessan Boyle. *I use my toenails actually – collect them, hammer them down, mold them into shape, but I guess you want a straight answer here.*
>
> *For the artist to give such loving attention to his own shoelaces was dangerous, even immoral.*
> – Saul Bellow

This chapter will present and discuss the findings and analysis of the data collected from the *Art of Fiction* and *Art of Nonfiction* interviews in the *Paris Review* (please see Appendix 1 for a complete list). As explained earlier, the aims of this stage of the study are to identify and assess 1) ways in which uses of surfaces and implements relate to writerly ways of thinking and 2) relevant contextual factors. These are also the queries raised by the research questions, which accordingly are used to structure this chapter. While an overwhelming proportion of the interviews in the *Paris Review* included instances of the terms searched, a small number did not, and a similar number did not mention a surface or implement despite the interviewer asking about the writer's way of work and writerly habits. Both sets of interviews are indicated in Appendix 1. Throughout this chapter, unless otherwise noted, the sources of the quotations are the interviews as published by the *Paris Review*; each initial reference to a writer is followed by 'int.' – denoting that the quote is being cited from an interview – and the year in which their interview was published.

Even on first glance, it is evident that the range and depth of the content, meaning, and tone of the references – as illustrated by Boyle (int. 2000) and Bellow (int. 1966) – varied significantly. Most data conveyed when and why a given surface or implement was used; when not stated explicitly, that information was implied to some extent. Some of the data, however, exclusively revealed pre-existing factors – enduring ways of perceiving, and attitudes, impressions, and conceptions not unique to the given situation or use – that shaped the given writer's use of surfaces and implements. Two points drawn from the findings are of relevance to the discussions throughout the entire chapter. In advance of their further consideration in Chapter 7, these points will be introduced here to inform the reading of this chapter and, as will be

discussed, of Chapter 6. First, structuring the understanding of 'writerly ways of thinking', the findings suggest that the concept entails: 1) the conscious and non-conscious choices that writers make *while* writing; 2) the ways writers consciously think or reason *about* writing; and 3) the ways writers perceive and draw intuitive impressions *from* their writing practices. Second, throughout the interviews the writers use many writerly terms and concepts, yet understandings or intended interpretations are not necessarily consistent. Grace Paley (int. 1992), for example, elaborates on drafts: 'I never understand what people mean when they say they've done twenty drafts or something. Does that mean they've typed it twenty times, or what? I'm always changing things as I go. It's always substantially different by the time I've finished. I do it till it's done.' The analysis of the interviews legitimizes Paley's confusion, revealing numerous interpretations of what a draft and drafting mean. Such terms and concepts are clarified as necessary by presenting and discussing the findings in what attempts to be natural language, not tied to disciplinary discourses.

Thus, in two main sections this chapter will present the findings and analysis in response to the study's research questions, presented below.

1. How are writing implements and surfaces related to writerly ways of thinking while composing?
    a. When and why do writers use non-digital writing implements and surfaces?
    b. When and why do writers use digital writing implements and surfaces?
    c. How are writerly ways of thinking supported by uses of surfaces and implements?
2. What are writers' pre-existing behaviours, ways of thinking, and collective experiences of writing that contribute to how implements and surfaces are used in specific situations?
    a. What are the contextual cues that shape how writers perceive and act when using surfaces and implements?
    b. What are the orientations, conceptions, and impressions that inform how writers use surfaces and implements?
    c. How do experiences of the effort and attention involved in writing relate to uses of surfaces and implements?

Question 1 is covered in Section 5.1 and question 2 in Section 5.2. *Prima facie*, the findings are as diverse as the minds of the writers themselves. Each of the sub-sections, therefore, seeks to

capture that rich spread of uses and ways of thinking while composing through the thematic frameworks that emerge.

## 5.1 Relationships between Modes of Transcription and Writerly Ways of Thinking while Composing

In three parts, this section will discuss how expert writers' uses of writing surfaces and implements are related to their writerly ways of thinking. For each part, the findings will be presented within the context of the analysis. The first two parts focus on references to instances of use while composing; Table 5.1 and Table 5.2 summarize the spread of the findings for non-digital and digital uses respectively. These sections inform the third part's discussion of how writerly ways of thinking might be supported by uses of surfaces and implements, among expert writers.

For the purposes of this dissertation, 'use' is to be understood in both concrete and abstract senses. Writers make use of computers, for example, both when using them to print and as metaphors for conceptualizing the writing process. Such abstract uses offer insights into how the writer incorporates that surface, implement, or device in conceptual ways that serve as or facilitate access to ways of thinking conducive to writing. Abstract uses while composing were analysed as findings and, thus, are presented in this section. References to surfaces and implements in the abstract that indicate influential characteristics and relationships of the writerly context, however, are covered in Section 5.2.

### 5.1.1 When and Why do Writers use Non-digital Writing Implements and Surfaces?

Here the findings on pens, pencils, paper (including journals, notebooks, and cards), unconventional non-digital surfaces (i.e. the bottom of a Kleenex box), writing by hand, and notes[25] are discussed. The findings suggest that the writers interviewed primarily use non-digital writing implements and surfaces in four ways that are dissimilar from their uses of digital devices. These ways include 1) to capture prose; 2) to transcribe internally crafted prose; 3) to craft the text before and alongside transcription, or drafting; and 4) to revise autonomously.

[25] Involving non-digital surfaces and implements, 'notes' has been included, as previously explained in Chapter 4, unless the reference explicitly cited a digital device.

**Table 5.1. Expert writers' uses of non-digital surfaces and implements**

| **Non-digital surfaces and implements**<br>***Pens, pencils, paper, journals, notebooks, notecards, and other non-digital surfaces*** | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Capturing prose** | |
| When practising as a daily routine, as a 3-day exercise in transcribing stream of consciousness | To keep such thoughts at maximum clarity and intensity |
| When making books of notes and writing in notebooks, particularly at night | To reproduce the flow of thought |
| Constantly: carried everywhere when writing a novel; 'an obsessive devotion' | To get stuff down. 'If it arrives you know. If you know it really has come, then you have to put it down' (Toni Morrison, int. 1993). |
| While living (until the story demands to be written) | One does not always carry real writing materials |
| When a good sentence, first sentence, or idea occurs or enters one's thoughts | One is not able to predict the waiting period until an idea is irresistible |
| When something with which one was having trouble falls into place | To accommodate thinking about it constantly so you take paper everywhere |
| **2. Transcribing internally crafted prose** | |
| When writing, though not necessarily where writing happens | Written words should be presentable |
| Once one knows as much as they can stand to know without writing | To write 'an actual line of intended text' |
| After turning a text over in one's mind; when the words in one's head have reached a stage of order that is fairly presentable | To have the ability to go back over and over; to save ideas for a story (but only for ones with climaxes) |
| **3. Crafting the text before and alongside transcription** | |
| When purposefully generating and recording content for text to be written: descriptions, stream of consciousness, observations, content that will and will not be included | To develop details about characters: the ages of characters, where they live, little maps, and facts about their lives; notes and random thoughts, descriptions of places, impressions of people, snatches of dialogue or new sophistication of plot; determining what not to include |
| When developing the organization of the text to be written: structure, chapter developments, plot, what needs to be done | To persuade oneself of truth in the writing – what they want to say: to ask self questions to prompt responses; for doing thinking on; to solve problems; to work out what will be written; to develop how the chronology would work |
| Separate but parallel to drafting on a computer | Details need to be negotiated outside what is written |
| While making several false starts before gaining momentum | Longhand allows for the erratic process |
| **4. Autonomous revising** | |
| When revising autonomously by hand after drafting at the computer | Revision is where the book is made |

| | |
|---|---|
| When selecting content after months of transcription; when identifying important details in text written | To add emendations and constructions and marginal notations and drawings and arrows and xs and scribbles; to make changes and corrections; to cross out and insert; to blue pencil written text … nothing compares with the fluidity |
| When ready to admit that something doesn't work | So the print-outs feel repossessed |

***Capturing prose***

Non-digital surfaces and implements were frequently cited with reference to the sudden transcription of thoughts, ideas, and observations that spring to fruition in one's mind – for *capturing prose*. For asserting control over spontaneous thoughts through externalization and materialization, writers both prepare and improvise. Some writers carry a utensil and notebook everywhere; others seize from their surroundings – whether their own palm or the hotel stationary available. This reflects how specific instances of capturing prose are driven by certain psychological states or impressions – often when natural word thoughts are sufficient, according to the individual writer, for representation in writing. Rendering inner thoughts concrete by hand illuminates how the use of a pen or pencil simultaneously accommodates the unpredictability of mental activity while facilitating an exacting transcription of valuable content for safekeeping. Writers' comments, some of which will be presented below, indicate how capturing prose by hand can be practised to reproduce thoughts, to address fears, and to preserve the prose for retrieval and manipulation at a later date.

In juxtaposition to their earlier uncertain nature, captured prose instils security both in the ease of retrieval and the privacy of the notebooks in which they have been concealed. Emmanuel Carrère (int. 2013) practises an exercise where for 'three successive days, [you] force yourself to write, without denaturalizing or hypocrisy, everything that crosses your mind'. He explains the premise: 'It's the same principle [that is] behind psychoanalysis … Everything you think is worth writing. Not necessarily worth keeping, but worth writing.' Despite such openness, each reference to doing the exercise involves a notebook: 'I'll take a notebook and for a few hours a day I'll just write whatever comes, about my life … I started writing in a notebook just what came to mind.' While committed to withholding judgement from the production of his thoughts into words, Carrère consistently safeguards the output between the bound covers of a notebook.

Manifesting the latent apprehension underpinning Carrère's use of notebooks, many writers detail concerns underpinning the capturing of prose more generally. The fear of

forgetting or losing potentially valuable thought content is articulated by Jean Cocteau (int. 1964): 'If the ideas come, one must hurry to set them down out of fear of forgetting them. They come once; once only.' Isaac Bashevis Singer (int. 1968) also comments on the transience of ideas, but shares how such thoughts might be received and captured in ways that are constructive for one's process. His solution is to use notes only to capture ideas that arrive for specifically structured stories: 'My stories are all based upon things that have come to me in life without my going out to look for them. The only notes I take are notes on an idea for a story. But it must be a story with a climax. I am not a slice-of-life writer. When such an idea comes to me, I put it down in a little notebook I always carry around.'

Like Bashevis Singer, many writers always go about their lives with surfaces and implements, or one or the other. Joseph Heller (int. 1974) 'keep[s] a small sheath of three-by-five cards in [his] billfold' to capture complete lines of prose. He explains: 'If I think of a good sentence, I'll write it down. It won't be an idea ... What I put down is an actual line of intended text ... Of course, when I come back to it, the line may change considerably.' When writing a novel, P. D. James (int. 1995) 'never go[es] anywhere without carrying a notebook in which [she] can jot down descriptions of places, impressions of the people [she] may meet, snatches of dialogue or a new sophistication of plot'. William Goyen (int. 1976) 'always carr[ies] paper … something to write on, always. And [he] keep[s] not so much a formal diary any longer, but, well, it's a notebook, and in it [he] keep[s] most things.' Goyen's reference to the diary illuminates how notebooks satisfy desires for privacy and an informal, often non-existent, monitoring of the text being produced.

While not necessarily carried everywhere, notebooks are used by many writers to secure seemingly ephemeral content for a seemingly unpredictable process. Paula Fox (int. 2004) 'start[s] keeping a notebook as soon as [she is] writing a book'. She affirms the interviewer's comment that 'these notebooks, they're sort of companion documents'. Louise Erdrich (int. 2010) has 'always kept notebooks – [she has] an obsessive devotion to them – and [she] go[es] back to them over and over. They are [her] compost pile of ideas.' Alice Munro (int. 1994) has 'stacks of notebooks that contain this terribly clumsy writing, which is just getting anything down'. Munro discusses how capturing prose in notebooks contributes to the nature of her process: 'I'm the opposite of a writer with a quick gift, you know, someone who gets it piped in.

I don't grasp it very readily at all, the "it" being whatever I'm trying to do. I often get on the wrong track and have to haul myself back.'

Capturing prose is often driven by feelings of urgency, even if moderated by different explanations. This is illustrated in particular by improvisation with one's surfaces and implements. For Jim Crace (int. 2003), a 'little idea will occur to [him] and [he will] write it on the soft part of [his] palm if – unlikely – [he] ha[s] a pen in [his] pocket'. For Reynolds Price (int. 1991), the first sentence 'arrives almost invariably in bed, when [he has] got to … write it down on the bottom of a Kleenex box or something because [he] never think[s] to have any real writing materials at hand'. Prose also arrives in the form of a solution to an enduring problem. In such instances, Toni Morrison (int. 1993) has 'written on scraps of paper, in hotels on hotel stationery, in automobiles. If it arrives you know. If you know it really has come, then you have to put it down.' Ultimately, capturing prose is about just that: putting it down. Non-digital surfaces and implements both serve that function while appeasing, accommodating, and supporting the engendering psychological and physical activity. Not all thoughts, however, are transcribed immediately.

***Transcribing internally crafted prose***

Many writers mentioned using non-digital surfaces and implements to transcribe prose that had been prepared consciously over a period of time. This crafting and its eventual manifestations either guide or become constitutive of the project at hand, but do not include the ways of thinking that result in modifications to the text. Uses of non-digital surfaces and implements in this category are distinguished by the nature of what is transcribed – mental activity that has been held for a period of time without being interrupted or redirected by the thinking and acts involved in externalizing text. The writers cited in this section suggest that the internalization of prose, before production, offers fluid and productive ways of manipulating and interacting with ideas for a text. Separate from the transcription, such internalization occurs often for a set interval, and while physically away from a current project – where and with what it is being transcribed. Why extensive, concentrated internalization is realized with non-digital surfaces and implements will be detailed below.

Those who write in longhand distinguish clearly between thinking and putting words on a page. When working on an engaging project, William Styron (int. 1953) will 'average two-and-a-half or three pages a day, longhand on yellow sheets'. The literal writing of those pages,

however, is not the primary activity: ‘I spend about five hours at it, of which very little is spent actually writing. I try to get a feeling of what’s going on in the story before I put it down on paper.’ Umberto Eco (int. 2008) would agree: ‘writing doesn’t mean necessarily putting words on a sheet of paper. You can write a chapter while walking or eating.’ Styron’s and Eco’s comments illustrate an association between longhand and deep internalization.

The anticipated presentation – visualization – of the words underpins the internal crafting done by Evelyn Waugh (int. 1963): ‘You see, there are always words going round in my head: some people think in pictures, some in ideas. I think entirely in words. By the time I come to stick my pen in my inkpot these words have reached a stage of order which is fairly presentable.’ Regardless, there are advantages and disadvantages in internally crafting prose. James Baldwin (int. 1984) shares a potential loss in relaying that characters ‘begin walking around before you put them on paper. And after you put them on paper you don’t see them anymore.’ The intimacy with ideas becomes transformed in their visual, external form – yet the visual provides valuable feedback for the internalization. Mario Vargas Llosa (int. 1990) shares how the eventual transcription illuminates a writer’s understandings of their own mental activity: ‘But despite all the notes you can take for a novel, I think that in the end what counts is what the memory selects. What remains is the most important.’

Citing an additional advantage, Jim Harrison (int. 1988) contends that advanced internalization obviates multiple iterations and revisions that are slightly more difficult with non-digital implements, but ultimately these are matters for the individual. He notes: ‘The people who do a lot of rewriting haven’t thought about it for three years. Some writers work it out on paper and I work it out mentally beforehand. It’s only a habit.’ Habits, however, are formed through repetition and, initially, learning. James Thurber (int. 1955) ‘spend[s] the mornings turning over the text in [his] mind. Then in the afternoon, between two and five, [he] call[s] in a secretary and dictate[s] to her.’ With this method, Thurber ‘can do about two thousand words. It took [him] about ten years to learn.’ In developing the ability to craft and to hold a text internally, Thurber suggests that deep internalization affords a special interaction with and attention to the text, absent of tools.

Non-digital surfaces and implements do not deceive writers. Their unobtrusive presence presents another reason why they are grasped following prolonged periods of internalization. Grounded in their reality, the writers’ thoughts and attention turn confidently inwards. According

to Martin Amis (int. 1998): ‘it’s all nonsense about how wonderful computers are because you can shift things around. Nothing compares with the fluidity of longhand. You shift things around without shifting them around – in that you merely indicate a possibility while your original thought is still there. The trouble with a computer is that what you come out with has no memory, no provenance, no history – the little cursor, or whatever it’s called, that wobbles around the middle of the screen falsely gives you the impression that you’re thinking. Even when you’re not.’

***Crafting the text before and alongside transcription***

In advance of and when embarking on a specific project, many writers use non-digital surfaces and implements while crafting the text being written. As in the previous section, crafting involves iterative processing, retrieval, and sculpting of content that both scaffolds and substantiates the ultimate written outcome and its reception. In contrast to both prior sections, however, instances that will be given here integrate surfaces and implements for constructive, generative experiences. Non-digital writing tools become formative for the thinking involved in producing the text. Writers, however, are not always conscious of how their surfaces and implements contribute to those processes. Made explicit are the psychological reinforcements, paced diction, and other affordances of writing by hand, along with the personal visual feedback. However, the latent reliability, simplicity, and intimacy in writing by hand, along with the distance provided by a separate surface, or notebook, contribute as well.

Angus Wilson (int. 1957) and Guy Davenport (int. 2002) write by hand during periods of gestation. In response to being asked whether he makes notes, Wilson replies: ‘Books of them. The gestatory period before I start to write is very important to me. That’s when I’m persuading myself of the truth of what I want to say, and I don’t think I could persuade my readers unless I’d persuaded myself first.’ Later in the interview, Wilson adds that the process of taking these notes also allows him ‘to keep a kind of check on [himself]’. Davenport ‘always write[s] in the notebooks at night’, which are central to his method: ‘there is a kind of gestation period, which [he] suppose[s] is common to all writers’. He clarifies that ‘a lot of [his] stories use the old Joycean epiphany’ and adds that ‘you wait until [an idea is] irresistible, then start working on it one way or another. When that time comes, [he] move[s] from longhand to the typewriter.’ Others clarify elements of construction by hand on a surface separate from that of the main text. Geoff Dyer (int. 2013) ‘jot[s] down quite a lot of notes and random thoughts on a legal pad or a

pad of foolscap paper, but the real graft happens on a laptop, with the help of a little black Ryman notebook where [he] write[s] down structural things and keep[s] track of what's going on, what needs to be done'.

Joan Didion (int. 1978) and Malcolm Cowley (int. 1982) approach paper to declare choices with meaningful cognitive and narrative implications. Didion explains how '[t]he minute you start putting words on paper you're eliminating possibilities. Unless you're Henry James.' Recursive progression occurs as the production of words reflects decisions that, once made, refine the subsequent decisions. Making the decisions is critical to that activity. Malcolm Cowley elaborates on the roles and implications of decisions made when producing text: 'Almost every word set on paper involves a choice. The writing of one page might involve hundreds of moral decisions. "Shall I use this word, which easily comes to hand, or shall I stop and search my mind for a slightly better word?" Those are aesthetic decisions which almost always have a moral element. Choosing the hard over the easy is already a moral choice.'

Whether scrawling, drawing, or indicating precise decisions about what is or eventually will be transcribed, notes allow for writerly thinking to materialize and to crystallize with few constraints. Paula Fox (int. 2004) develops her themes through notations that exemplify the various thematic dimensions and components. 'I do everything by hand on yellow legal pads, and then I transfer and broaden and deepen on the typewriter. And I put down notes. I start keeping a notebook as soon as I'm writing a book. The way people talk to one another will be something I scrawl down. And then I'll put down something like: mockingly. I sort of develop the theme. The theme is the way people talk to each other, and then I put down different descriptions of the conversations: impulsive; seductive; enraged. Kind. Tender. Sweet. And it goes on like that.' Writing in a notebook gives Fox freedom from the linear text.

Like Fox, both Angus Wilson (int. 1957) and Peter Carey (int. 2006) craft non-linear thought journeys in and through notes. Wilson makes 'notes about the ages of the characters, where they live, little maps, facts about their lives before the book starts'. Carey uses notes to respond when asking himself 'What will happen in that chapter?' He then will 'look at those chapters as little boxes or rooms, and [will] start to ask [him]self what happens within each room'. The concurrent feedback and relief provided by displacing the content supports the writers in finding opportunities for the written text and lessons for the process. In these instances, the writer is conscious of the ways he wants to think but not necessarily of how writing by hand,

taking notes, or writing in a notebook facilitates that. Both explicitly and implicitly, non-digital surfaces complement the needs of writers in ways that permit their desired writerly ways of thinking.

***Autonomous revising***

Autonomous revising refers to the processes involved in identifying and indicating changes to be made to a text while reading a complete draft. What distinguishes such revisions is when they occur relative to the writing process: after completing a draft.[26] This suggests that the writer's mind is focused on reading – interpreting – the draft in order to identify for opportunities and changes, without also trying to produce the draft. In another sense, revising conducted autonomously entails spatial separation – physical distance – from the draft produced for completing a task with a separate purpose. Throughout the interviews, the writers referred to using non-digital implements and surfaces for both the distinct temporal and spatial advantages. 'I edit with a pen, I write on a computer,' reveals Nicholson Baker (int. 2011).[27] Such sharp dichotomies offer fresh perspectives for concentrating on what has been written. The findings discussed below also illustrate that the mechanics and sensations of writing by hand facilitate control over and access to the lived experience of the text and its revision.

Many writers complete their autonomous revisions on print-outs. In conjunction, the affordances of pens and pencils and writing by hand, and the cues and properties of typeface on tactile paper, stabilize the interpretive, problem-solving mental processes of revision.[28] Julian Barnes (int. 2000) normally 'type[s] on an IBM 196c, then hand correct[s] again and again until it's virtually illegible, then clean type[s] it, then hand correct[s] again and again. And so on.' He shares that he lets go '[w]hen … the changes [he is] making are dis-improving [his] text as much as improving it'. Ha Jin (int. 2009) also revises on hard copies. He explains '[r]evision … is where the book is made, because the process of revision is not just about making the prose more polished. While revising the manuscript, [he] begin[s] to be aware of the nuances, the possibilities. So it's a kind of interpreting process.' Jin's commitment to revision is reflected in his systematic, purposeful approach: 'I print out the hard copies and work on those. I use

[26] Whether this changes the nature of the revisions qualitatively is beyond the scope of this section.
[27] Though not necessarily referring to revising, David Mitchell (2010) articulates a similar experience: 'I do my thinking on paper, and act on my thinking on the laptop.'
[28] Here the focus is on paper as the non-digital surface; the effects of typeface are explored further later in the chapter.

different pencils, different coloured pens. That way I can remember what revision I made the last time. And I'll repeat this many times – many, many times.'

Like Jin, Philip Roth (int. 1984) uses coloured ink, 'underlin[ing] in red a paragraph, a sentence, sometimes no more than a phrase, that has some life in it'. While paper allows Roth to read the text for an idea, the red ink offers a simple, yet clear visual indicator. For Maya Angelou (int. 1990), the cruellest time is 'to really admit that [something in the draft] doesn't work … to blue pencil it'. Literally and figuratively, marking text in colour by hand denotes the writer's authority and control over the text.

Like crafting the text, revising a draft well demands meticulous attention to rhetorical and formal details. When directing mental effort to processing and evaluating those elements, writers seek a way of symbolizing, or communicating, their responses accurately but with minimal effort. The familiar gestural liberties of marking by hand are utilized by both Annie Proulx (int. 2009) and Jeffrey Eugenides (int. 2011) when conducting autonomous revisions. Their descriptions of their notations and how they make their markings illustrate a notable need for control over where and what they write. After typing, Proulx 'start[s] printing out drafts and adding in emendations and constructions and marginal notations and drawings and arrows and x's and scribbles and that sort of thing'. Jeffrey Eugenides (int. 2011) discusses a similar approach and explains what has changed over time: 'There's usually a period where I make corrections by hand, turn the page over, and write new paragraphs on the back of the sheet. I used to do that almost every day. It seems I do that less and less often. Now I can go as long as a month before printing something out. But there are always handwritten corrections at some point.' This highlights an irreplaceable value for Eugenides's texts in autonomous revising by hand.

When the lived experience of typeface on paper feels removed, handwriting autonomous revisions allows writers to deepen their connection with the text in subtle yet visceral ways. Louise Erdrich (int. 2010) 'write[s] a lot by hand on the print-outs so they feel repossessed'. Materially personalizing print-outs highlights the sensations writers look for when interacting with a text. Janet Malcolm (int. 2011) has 'a brilliant editor' whom she distinguishes as having an 'ear for language and delicate pencil'. Autonomous revising by hand attunes the writer to intricate sensations and acoustics. How the haptic activity facilitates those dynamics will be explored in Section 5.2.

### 5.1.2 When and Why do Writers use Digital Writing Implements and Surfaces?

This section focuses on uses of keyboards belonging to typewriters, word processors, and computers (including microcomputers, laptops and 'machines'), and screens. As noted, references to the act of typing – type, typing, and retyping – were analysed as uses of a keyboard either on a typewriter or a computer, as was often clarified in the surrounding text. The findings reveal how digital writing implements and surfaces are used in four, distinct ways: 1) to stimulate and to elicit writerly intuition; 2) to engage writerly perception; 3) to facilitate recursive modifications; and 4) to optimize and to objectify the writing experience.

**Table 5.2. Expert writers' uses of digital surfaces and implements**

| **Digital and bi-manual surfaces and implements**<br>***Manual and electric typewriters, computers, laptops, screens, keyboards*** | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Stimulating and eliciting writerly intuition** | |
| When beckoned by the interactivity of the device | Renders the adventure on paper fresh |
| Once the unconscious is ready | The experience of typing extracts the unconscious, allowing one to transcribe and to sense – and see – the inexplicit |
| While waiting patiently for the writing to occur | |
| When projecting thoughts and surrendering to the process | The mechanical process of touching keys sharpens thoughts |
| When one knows, or has planned or formed in their mind what will be written | For typing out, not composing |
| When there is a deadline or urgency | For the speed and familiarity |
| **2. Engaging writerly perception** | |
| When learning sentence rhythms | Typing sentences reveals how they work |
| When needing to see the text in a single space | Format provides accurate visual of the narrative landscape, and structure to the spatial orientation of the visual feedback; attention to the visual feedback facilitates recognition of good sentences |
| After setting problems | To process what is being written – a sentence, a book – in a different way: through one's fingertips |
| Before printing and editing with a pen | The tactility, physicality, and appearance of print-outs provides sense of accomplishment |
| After drafting by longhand or once the longhand text has matured | Writing on screen, in typeface, is perceived as almost complete |
| **3. Facilitating recursive modifications** | |
| When manipulating words, carving fiction in ether, drafting and re-drafting in a single document | Keeps the text amorphous and fluid, enabling recursive revisions, allowing drafts to dissolve into drafting; provisional nature is like unspoken thought; if not retyping, you are denying yourself those improvements; facilitates spontaneity after all of the planning |

| | |
|---|---|
| When creating words through recursive experiments in letter sequences | To find something new in the repetition |
| When materializing thinking | Typing is fast and the text on screen is impermanent |
| When making notes and once your notes are complete | Typing allows you to transfer and broaden and deepen, through fluid construction |
| **4. Optimize and objectify** | |
| When looking for previously written, stored prose; when counting words | Compensates for memory and automates counting and storing words |
| As a metaphor for mental activity | Perception of technology abilities varies with control of a device |

### *Stimulate and elicit writerly intuition*

The keyboard is the destination for many writers after periods of passive or non-conscious dwelling. Others will arrive having pondered an opaque plan and still others will simply land and wait. Then there are the writers who arrive at the keys with no plan other than faith in the proleptic powering of their digital device. Writerly intuition, in each instance, either is stimulated or elicited by the mechanics, the experience of being at and typing on a keyboard. The psychological state of arrival contributes to these dynamics. Writers feel both comfort and terror on sitting down to a keyboard without having prepared. As will be presented below, the nature of what is eventually typed suggests that those states persist while typing. In all of these instances, the keyboard proves the ideal implement for interacting with writerly intuition: long-term knowledge of the mechanics of writing, intuitive ideas about what to write, and the procedural knowledge necessary to execute the transcription.

Before he is ready to explore at a keyboard, Reynolds Price (int. 1991) will dwell in unstructured thoughts and feelings. After 'the unconscious has done a lot of cooking in the basement', Price begins 'making notes at the keyboard' – endless letters to [him]self – which he refers to as 'contingency studies, strategic extrapolations'. Believing that a writer should not know 'too much where he's going', James Thurber (int. 1955) shares how he only comes to know what would happen in a text when he 'sat down at the typewriter and found out'. Norman Mailer (1964) discusses experiencing a lack of conscious control at the typewriter: 'I had no idea where it was going to move from day to day. I'd wake up and push the typewriter in great dread, in literal terror, wondering when this curious and doubtful inspiration was going to stop. It never quite did … I always felt as if I were not writing the book myself, but rather as if I were serving as a subject for some intelligence, which had decided to use me to write the book. It had nothing

to do with whether the work was good or bad. It just had to do with the fact that I had absolutely no conscious control of it.'

John McPhee (int. 2010) implies that he prepares to no avail for the ultimate transcription on a keyboard. He explains how the mechanical interaction with the keyboard dissolves the potentially stringent attention to writing mechanics or what had been prepared: 'You've got all the notes there; you come in in the morning and you read through what you're going to try to write, and there's not that much to read. You're not worried about the other ninety-five percent, it's off in a folder somewhere. It's you and the keyboard. You get away from the mechanics through this mechanical means. The spontaneity comes in the writing, the phraseology, the telling of the story – after you've put all this stuff aside.' The keyboard offers both Price and McPhee a path to generative exploration. Like McPhee, Katherine Anne Porter (int. 1963) turns to the typewriter to tell a story. She explains how she types away without fixating on form, technique, or craft: '[a] story forms in my mind and forms and forms, and when it's ready to go, I strike it down – it takes just the time I sit at the typewriter. I never think about form at all. In fact, I would say that I've never been interested in anything about writing after having learned, I hope, to write. That is, I mastered my craft as well as I could. There is a technique, there is a craft, and you have to learn it. Well, I did as well as I could with that, but now all in the world I am interested in is telling a story.' Porter, however, does not have to attend to technique or craft as they are intuitive.

Many writers report a magical stimulus upon sitting at or powering up their digital device. Jim Crace (int. 2003) finds that the 'mystery, for [him], is … [when he is] required, almost at the switching on of the computer, to reach the landscapes of the narrative'. Mario Vargas Llosa (int. 1990) also finds that '[s]tarting up the typewriter creates a certain dynamic – it's like a warm-up exercise'. Others wait at a typewriter in anticipation of the stimulus. William Maxwell (int. 1982) will 'just hang over the typewriter waiting to see what is going to happen ... [He] wait[s], as actively passive as [he] can possibly be.' Anthony Powell (int. 1978) shares a similar experience: 'in my early days I would quite often sit in front of a typewriter the whole morning without producing anything at all – it was not at all uncommon'. The typewriter may elicit intuition but additional elements must be present and active to create the flow; some are revealed by uses of digital devices to develop writerly intuition.

As well as eliciting writerly intuition, digital devices are also used for its development: to accumulate and to process the relevant knowledge. John Irving (int. 1986), for example, uses a typewriter to transcribe the information that substantiates his writerly intuition necessary to commence a book. Irving does not begin a book 'until [he] know[s] as much as [he] can stand to know without putting anything down on paper'. He reflects on writing *Setting Free the Bears* and *The Cider House Rules*: 'I had to learn so much before I could begin those books; I had to gather so much information, take so many notes, see, witness, observe, study – whatever – that when I finally was able to begin writing, I knew everything that was going to happen, in advance. That never hurts. I want to know how a book feels after the main events are over. The authority of the storyteller's voice – of mine, anyway – comes from knowing how it all comes out before you begin.' The typewriter allows Irving to make notes without formally putting anything to paper. As such, conscious knowledge leads to intuitive knowledge – both of which are developed and instilled through his time at the typewriter.

***Engage writerly perception***

The Oxford English Dictionary defines perception as 'the ability to see, hear or become aware of something through our sense'. Those abilities expand and permeate the writing process beyond the cognitive dimensions of the lived experience. Writerly perception, the activity of the senses for and while writing, deepens understandings of the experience of the writing process and the written text. References throughout the interviews to uses of digital devices and implements continually alluded to an engagement of writerly perception: tactile, visual, acoustic, and spatial and time perception. Instances when digital devices engage writerly perception are discussed in what follows. How and what writers perceive while writing and the orientations, impressions and conceptions that those perceptions inform, will be discussed in Section 5.2.

Joan Didion (int. 1978) recalls typing to see how sentences – sentences that feel natural – work, to learn their rhythms. Through repeated tactile interaction and continuous visual engagement, Didion learned to transform her feeling for sentences into an ability to produce them. She tries to explain: 'I thought that I could learn – because they felt so natural. I could see how they worked once I started typing them out. That was when I was about fifteen. I would just type those stories. It's a great way to get rhythms into your head.' James Salter (int. 1993) suggests that typing facilitates opportunities for processing one's writing: 'I sit down and type. And then I retype, correct, retype, and keep going until it's finished … I find that the ease of

moving a paragraph is not really what I need. I need the opportunity to write this sentence again, to say it to myself again, to look at the paragraph once more, and actually to go through the whole text, line by line, very carefully, writing it out. There may be even some kind of mimetic impulse here where I am trying to write like myself, so to speak.' Reading is insufficient. Salter must physically hit each key necessary to process and to produce his text.

Luisa Valenzuela (int. 2001) evaluates her work by the intonation heard as she types the text: 'Writing by hand forced me to retype each page at least three times, and each time I retyped it I would hear the pound of the words, and polish them until they reached the perfect intonation.' Unable to 'work with a motor around', Heinrich Böll (int. 1983) extends his acoustic sensitivity to describe his relationship with the typewriter: 'The typewriter is for [him] really an instrument … something like a musical instrument … The process of writing on the typewriter is a productive process.' Clarifying that the typewriter is like a *musical* instrument suggests that the attention to sound carries from the context to the processes of production, at the typewriter. Valenzuela and Böll reveal how the typewriter engages the ear for both sustaining and evaluating the written text.

William Maxwell (int. 1982) explains how writerly perception may follow states of non-conscious dwelling in writerly intuition. Sitting 'with [his] head over the typewriter waiting patiently, empty as a bucket that somebody's turned upside down, [Maxwell waits] for a story to come from what you could call [his] unconscious. Or it could be from the general unconscious.' Maxwell's work seems to depend on the elicitation of writerly intuition. His next comment, however, suggests how that process – the transformation of intuitive knowledge into text – commences with perception: 'Often before poets write a poem they begin to hear the cadences of it, and then they begin to hear humming in their ears, and there are other strange manifestations, and then finally words. The last is the words.' As the words arrive, Maxwell is able 'to recognize a good sentence when [he has] written it on the typewriter'. In addition to the visuals of the text, digital devices render memory storage and retrieval increasingly external, visual. Memories of text are stimulated visually, versus retrieved internally. Jonathan Franzen (int. 2010) explains how after years of writing, 'you end up doing a lot of assemblage from scavenged materials. And with a computer you're more likely, on a slow morning, to drift over to another file folder and open up something old. Chunks of text travel with you, rather than getting buried in a drawer or stored in some remote, inaccessible location.'

Margaret Drabble (int. 1978) and Tom Wolfe (int. 1991) discuss how typing allows one to thrive from time pressures. 'If a book is going reasonably well', Drabble will 'write terribly fast'. She attributes this to 'always [being] short of time' and notes that she has 'always been saving up the time to work so that by the time [she] actually get[s] to the typewriter [she] usually [has] a very good idea of what [she has] got to get through'. Wolfe also uses time pressure to his advantage: 'For eight months I had sat at my typewriter every day, intending to start this novel and nothing had happened. I felt that the only way I was ever going to get going on it was to put myself under deadline pressure. I knew that if I *had* to, I could produce something under deadline pressure.'

***Facilitate recursive modifications***

With the dawn of word processors, and then computers, writers were given the tools to modify recursively – that is, to make changes instantly to the text: its substance, form, and format. Any amount of text and punctuations could be deleted by pushing one button and then retyped; this process could be repeated endlessly and the result would still look *clean*. Automating the ability to modify, move, and search one's text with seemingly no consequences to permanence, digital surfaces, and implements facilitates recursive modifications in numerous ways. As illustrated in the excerpts below, those ways include revealing new opportunities, enhancing one's commitment to the page, allowing linguistic creativity, and liberating one's thoughts to ebb and flow void of constraints or obligations.

Henry Miller (int. 1962) and Martin Amis (int. 1998) highlight how the act of typing reveals valuable opportunities for making modifications. Even after 'use[ing] a pen and ink to make changes, cross out, insert', Miller will continue to revise on the typewriter: 'I retype, and in the process of retyping I make more changes. I prefer to retype everything myself, because even when I think I've made all the changes I want, the mere mechanical business of touching the keys sharpens my thoughts, and I find myself revising while doing the finished thing … in a way the machine acts as a stimulus; it's a cooperative thing.' Similarly, Amis finds 'that the very act of retyping will involve you in thirty or forty little improvements per page. If you don't retype, you are denying that page those improvements.' Amis affirms that his typing stage involves greater momentum, noting: 'It begins to look like a book rather than a collection of doodles.' The immediate visual feedback provides another stimulus in addition to the tactile feedback.

Whether by raising self-imposed expectations or by enabling impermanent experimentation, the ability to revise recursively fuels writers' commitment to the page. Umberto Eco (int. 2008) 'think[s] we are by nature never happy with what we have done. But now it is so easy, perhaps too easy, to correct it. Therefore in a sense we have become more demanding.' Space and time are compressed. 'With a computer' Eco found that 'it is very easy to go over a page ten or twenty times on the same day, correcting and rewriting.' The ease of modification and manipulation also changed how John Hersey (int. 1986) experiences revising. Hersey reports that the word processor 'has made revision much more inviting to [him], because when [he] revised before on the typewriter, there was a commitment of labour in typing a page; though [he] might have an urge to change the page, [he] was reluctant to retype it. But with this machine, there's no cost of labour in revision at all, so [he has] found that [he] spen[ds] much more time, much more care, in revision since [he] started using it.'

From the isolated keys on the typewriter to the impermanence and immediate feedback afforded by the keyboard connected to a computer, digital devices also facilitate informal, recursive explorations when generating significant details of the text. To create character names, Heinrich Böll (int. 1983) will 'improvise on the typewriter, just as one improvises on the piano. [He] think[s], well, it starts with a D, then I put down an E, and then an N and so forth. So then he's named Denger or some such name.' Salman Rushdie (int. 2005) recounts typing 'manically, one [syntax] after the other, over and over again' potential titles for a book. 'And then, after about a day of typing', he produced *Midnight's Children*, which he thought was 'a really good title. And it showed [him] the centre of the novel. It's about those children.'

After writing first in longhand, Harold Brodkey (int. 1991) will transcribe on the computer, which allows transcription to occur without the mechanical impositions of the typewriter. He discusses his frustrations: 'The typewriter was a terrible trial for me; it's too goddamn linear. You can't actually project a genuine thought on a typewriter, it's so mechanical. And it's rattling away while you're watching and thinking and getting it down. You can only recite on a typewriter; it gets into the prose, into the sense of story, into the sense of character. You're pounding away and so is the typewritten story.' Brodkey's sentiments allude to how the mechanics and perception of the execution can constrain the writer's thinking. Ian McEwan (int. 2002) elaborates on this: 'Word processing is more intimate, more like thinking itself. In retrospect, the typewriter seems a gross mechanical obstruction. I like the provisional nature of

unprinted material held in the computer's memory – like an unspoken thought. I like the way sentences or passages can be endlessly reworked, and the way this faithful machine remembers all your little jottings and messages to yourself.'

Jonathan Lethem (int. 2003) 'only endlessly manipulate[s] the words on the screen, carving fiction in ether. I enjoy keeping the book amorphous and fluid until the last possible moment.' As Lethem indicates, recursive revisions obviate the material or technical necessity of having independent drafts. Geoff Dyer (int. 2013) observes that '[o]ne draft is being constantly consumed into another'. Continuous drafting, however, is not a function of the laptop. As Dyer notes, '[t]he laptop means that the distinction between drafts has disappeared'. That distinction, however, provides a certain frame of reference. Dispensing with that framing, writers submit familiar forms of control and structure in exchange for a responsive, endless process. As Lorrie Moore (int. 2001) states: 'as for revising, well, computers really are God's gift to writers. It took me a long time to accept even the possibility of that.'

***Optimize and objectify***

Many writers use digital devices throughout their writing processes to optimize their attention and effort while writing. The tools available through digital devices give writers the capacity to complete processes that are multi-stage and time consuming when executed with non-digital devices, all within a tap of a finger on a mouse, a keyboard, or a screen. Chunking a number of tasks in one affords the writer mental power and time to allocate to other tasks, and a satisfaction in this efficiency. As conveyed by their explanations of how these devices optimize their processes, what precisely is occurring in such an instance is transformative, if mystifying: these concrete, realized efficiencies are vaguely understood. Illustrating this are references to optimization that position digital devices as the 'Other', detached from the self and objectified in the writing process. The mechanical efficiency of digital devices reorients the writer's relationship to their surfaces and implements. As captured below, uses of digital surfaces and implements that optimize and objectify the process prove related and mutually revealing.

William Gibson (int. 2011) switched to using a computer only after hearing about the optimization. He records the conversation: 'Bruce Sterling called me … and said, "This changes everything!" I said, "What?" He said, "My Dad gave me his Apple II. You have to get one of these things!" I said, "Why?" He said, "Automation – it automates the process of writing!" I've never gone back.' Gibson does not elaborate further on how *it,* one of those *things,* automates his

writing. A. S. Byatt (int. 2001) does her 'journalism on the computer with the word count', selecting her tools according to a single optimization feature. Byatt discusses the word count as some magical *thing* that one puts on: 'I love the word count. I can write a piece now to the word, to the length, and then I put the word count on and triumphantly it says three hundred and two. It's a quite different thing.' For Gibson and Byatt, the magic masks an unvoiced unawareness; the objectivity emerges from the optimization.

Paula Fox (int. 2004) finds that the experience of transcribing on an IBM Personal Wheelwriter II objectifies her sense of self. She explains how there is 'an awareness of your outer appearance, of how you talk and look and act, and an awareness of your mind in certain outer ways – but whatever it is, it gets in the way of writing.' Robertson Davies (int. 1989) 'type[s] because writing by hand [he] find[s] to be a very great betrayer. If you write carefully and try to write legibly, as [he does], you finish a page and think, That's a handsome page. This is absolutely wrong … If you type … you have what you've written there before you cold and bare. Then you can go over it, and it is as though someone else had written it and you can edit it with great severity.' Davies points to an objectivity of the visual text created when using a typewriter. The objective appears to progress his process. Like Davies, Gay Talese (int. 2009) incorporates the objectivity fostered by digital devices when making a transition between stages. When Talese thinks he is 'getting close, that's when [he] put[s] it on the computer. Once it's on the screen, [he] make[s] very few changes.'

Whether distracting or productive, the objectivity of digital devices offers different perspectives through which to view the writing process and product. Nicholson Baker (int. 2011) exemplifies how that objectivity might be leveraged, or optimized, for the production, even the creativity, of writing. Integrating sessions with a video camera, audio recorder, and computer, Baker can repeat the process of externalizing and capturing prose, a process that depends on the efficiency and compatibility of his devices as distinct audiences for his rehearsals. He explains the advantages of production in different forms, noting that it is 'helpful to try things over and over again, like writing multiple drafts. At the beginning, [his] explanations were orthodox and simple, but by the fifth time through [he] was a little bored with what [he] wanted to say about iambic pentameter, and instead [he would] fling something in about clothespins.'

### 5.1.3 How are Writerly Ways of Thinking Supported by Uses of Surfaces and Implements?

In examining when and why writers use non-digital and digital surfaces and implements, numerous valued and desired writerly ways of thinking were discussed. Writers engage different qualities and affordances from different surfaces and implements for purposeful and non-conscious practices. Those practices and uses reflect and are enacted by certain ways of thinking, as discussed in the sections above. Examining how those ways of thinking relate to the uses of surfaces and implements revealed four primary relationships that transcend the binaries of digital and non-digital. Uses 1) accommodate the nature of ideas to make them highly accessible; 2) provide frames for structuring the thinking involved in developing a text; 3) facilitate desired writerly ways of thinking for and while transcribing; and 4) facilitate desired access to effective monitoring activities. For example, both digital and non-digital devices are used to accommodate the nature of ideas to make them highly accessible. With regard to the presentation below, it is important to understand that each relationship encompasses a range of uses and that individual uses may reflect more than one. While the relationships are underpinned by a cohesion that mirrors the progression of a text, each category magnifies the diversity of uses and writerly ways of thinking that occur at each stage in the writing process.

#### *Uses accommodate the nature of ideas to make them highly accessible*

Filling the content and guiding the form, ideas constitute the essence of writing. Their singular role in writing is illustrated by the care, effort, and respect that writers display when discussing their transcription. Many writers relayed an awareness of how their ideas arrive, form, and change while writing; others did not. Some writers reported that the nature of their ideas have changed over time, from one project to another. For many writers, the use of surfaces and implements calibrated their mental activity in ways that supported the production of their ideas into written text during a given moment. These instances revealed how expert writers possess an intuitive ability to use surfaces and implements in ways that accommodate the nature of ideas to make them highly accessible.

Writers seek to render their ideas visual and to process them as concrete text. In certain instances, the goal simply is to materialize the ideas as text; in others, the goal is to use the process of transcription to craft the idea into the desired text. Expert writers demonstrate the ability. P. D. James (int. 1995) ‘prefer[s] writing by hand but [her] handwriting is so bad, particularly when [she is] writing quickly, that [she] can barely decipher it [herself] the next

day'. To make her writing legible, James then will 'transfer the handwriting to tape, which [her] secretary types out to provide the first draft'. Other writers use the pace of writing by hand to modulate transcription. Stephen King (int. 2006) would revert to longhand because it 'made the rewriting process a lot more felicitous … [His] first draft was more polished, just because it wasn't possible to go so fast. You can only drive your hand along at a certain speed. It felt like the difference between, say, rolling along in a powered scooter and actually hiking the countryside.' Gay Talese (int. 2009) also 'want[s] to be forced to work slowly', but 'because [he does not] want to get too much on paper'. When Norman Mailer (int. 1964) finds himself 'blocked on the typewriter' he will 'shift to longhand'. For King, Talese, and Mailer, the slower pace enforced by different implements regulates and filters what their thoughts generate into prose. These writers reveal how one's uses of implements afford specific, individual acts of transcription that not only sustain and focus but also stimulate the writerly production of ideas.

William S. Burroughs (int. 1965) creates processes of free association by using a typewriter and then scissors to cut what has been written. Asked whether he could obtain the effect of working with scissors and the pieces of paper 'by simply free-associating at the typewriter', Burroughs explains that his 'cut-ups make explicit a psychosensory process that is going on all the time anyway'. The pure mental production of written language, according to Burroughs, does not have the capacity to recreate fully the psychosensory nature of living: 'One's mind can't cover it that way'. He adds: 'Your mind simply could not manage it. It's like trying to keep so many chess moves in mind, you just couldn't do it. The mental mechanisms of repression and selection are also operating against you.' Burroughs reveals limitations of using only a typewriter to capture and to develop certain ideas. As discussed, Paula Fox shares similar concerns regarding how the typewriter shapes the construction of her ideas. By using a notebook, she allows her thoughts to flow without having to conform to a linear expression. Burroughs's and Fox's uses of writerly tools illustrate how even inexplicable and non-linear ideas might be made accessible with proper uses of surfaces and implements.

Joyce Carol Oates (int. 1978) shares how the nature of her expression has required different surfaces and implements over time. While she wrote her 'last several novels in longhand first … now everything finds its initial expression in longhand and the typewriter has become a rather alien thing – a thing of formality and impersonality. [Her] first novels were all written on a typewriter: first draft straight through, then revisions, then final draft. But [she] can't

do that any longer.' It is unclear whether the evolution of her relationship to her writing implement has come to determine the initial expression of her work or the expression of her work has come to require a certain relationship to her writing implement. Regardless, Oates reveals how the array of writing implements and surfaces might be used to adapt to the changing nature of her ideas.

***Uses provide frames for structuring the thinking involved in developing a text***

Throughout the interviews, the writers iterated that there is no formula by which one writes or should write. As John McPhee (int. 2010) reveals, 'It may sound like I've got some sort of formula by which I write. Hell, no! You're out there completely on your own – all you've got to do is write … I go hours before I'm able to write a word.' Asked how he develops a text, Orhan Pamuk (int. 2005) answers, 'There is no constant formula.' While often responding to an explicit question, the writers' agreement[29] captures the boundless thinking that might occur when developing a text. To manage and to structure a process that even experts contend lacks a formula, many writers derive frames from their uses of surfaces and implements. Here 'frame' refers to any construction that provides support to the production of written text. Note that the focus is on the processes of production – how one writes the text – and not on what is written. Turning to different spaces or allocating specific times for specific practices, for example, infuses the process with cues that clarify and embed structure within the process which allow the writer to focus on writing the text (not how one will write the text).

Whether for fresh perspectives or anticipated intellectual cues, writers find frames in changing their surfaces and implements. Norman Rush (int. 2010) 'use[s] three different typewriters at once, two Royals and one wide-carriage Underwood, all from 1955.' He explains the purpose of each: 'I write the main narrative on one of the Royals, while reworking earlier sections on the other Royal, and generating fresh associations on the Underwood. That way, I'm inhabiting the novel in different stages without getting too far from the main stream. I'm not unaware that my system is ludicrous, and something like a prehistoric computer. Once I have twenty-five pages or so, I'll then use the main Royal to retype the draft.' Robert Stone (int. 1985) must 'have a pen in [his] hand when [he is] not actually typing', which he does 'until something

[29] Occasionally, writers' comments on formulae for writing were humorous or hyperbolic, suggesting that formulae remain elusive even when conceived. William Faulkner (int. 1956), for example, has the view that the formula for being a good novelist is 'Ninety-nine percent talent ... ninety-nine percent discipline ... ninety-nine percent work.'

becomes elusive. Then [he] write[s] in longhand in order to be precise.' He explains: 'On a typewriter or word processor you can rush something that shouldn't be rushed – you can lose nuance, richness, lucidity. The pen compels lucidity.'

Such structure, or lucidity, might also be attributed to the linguistic frames and ways of thinking involved in or induced by the processes of writing. This is illustrated through comparisons with oral language either as content for dialogue or as the text dictated. Trying to capture spoken language in text for writing, Jack Kerouac (int. 1968) once 'typed up a segment of taped conversation with Neal Cassady' but found that 'it really doesn't come out right'. He elaborates, 'when all written down and with all the *ahs* and the *ohs* and the *ahums* and the fearful fact that the damn thing is turning and you're *forced* not to waste electricity or tape … Then again, I don't know, I might have to resort to that eventually; I'm getting tired and going blind. This question stumps me. At any rate, everybody's doing it, I hear, but I'm still scribbling. McLuhan says we're getting more oral so I guess we'll all learn to talk into the machine better and better.' While increasingly popular in 2014, talking into machines has yet to become a norm. Kerouac highlights how using surfaces and implements offers structures that support the thinking involved in the development of both writing in general and spoken language as written content (e.g. dialogue). He was not, however, the only writer to comment on the nuances between written and oral language production and reception. The evolution of James Thurber's use of surfaces and implements illuminates Kerouac's challenges. While Thurber mentioned how typing initially revealed the development of a text to him, he did learn over 'many years' to develop lengthy sections in his mind for dictation. In both scenarios, however, the nature of surfaces and implements – if physically absent – offered access to specific frames that shaped the production of texts.

***Uses facilitate desired writerly ways of thinking for and while transcribing***

Throughout the interviews, the writers frequently reveal that uses of surfaces and implements facilitate, whether by initiating or accommodating, writers' desired writerly ways of thinking. In specific instances, the uses prove proleptic by fulfilling expectations, and liberating and adapting to the thinking. These dynamics underpin fluid processes of transcription, which allow the writer's mental energy to remain singularly directed towards the generation of the text. When a writer cannot transcribe their thoughts in the way or at the pace that corresponds to their understood inner nature, the thinking must correspond to the use. Sometimes that is beneficial.

Being particular about his writing tools and time is necessary for John le Carré (int. 1997) simply to be able to think: 'I write by hand, and my wife types everything up, endlessly, repeatedly. I correct by hand too. I am an absolute monk about my work. It's like being an athlete: you have to find out which are the best hours of the day. I'm a morning person … The first page and the first chapter are a matter of endless fiddling, cutting out all the good bits, putting in a whole lot of verbiage. Actually, it's my only way of thinking. Without a pen in my hand I can't think.' Margaret Atwood (int. 1990) 'prefer[s] to write with pens that glide very easily over the paper because [her] handwriting is fast'. She shares how that preference is underpinned by her erratic thinking that a typewriter could not materialize: 'Actually, I don't churn out finished copy quickly. Even though I have this fast handwriting, I have to scribble over it and scratch things out. Then I transcribe the manuscript, which is almost illegible, onto the typewriter.'

Russell Banks (int. 1998) 'love[s] the word processor'. He explains why: 'The faster I can write, the more likely I'll get something worth saving down on paper. From the very beginning, I've grabbed onto any technology that would allow me to write faster – a soft pencil instead of a hard pencil, ballpoint instead of a fountain pen, electric typewriter instead of manual, and now, working with light on a screen rather than marks on a page, I find that I can noodle and doodle and be much more spontaneous. It doesn't mean that I don't go back and rework and rework and rework.' Like Banks, Ann Beattie (int. 2011) looks for speed. She 'type[s] sixty words a minute on a typewriter, and … eighty words a minute on a computer.' She reveals how the different transcription speeds afforded by different surfaces and implements support her thoughts by keeping apace with them. Beattie notes that it is 'really interesting when you're doing a first draft. The computer can more or less keep up with [her] thoughts. No electric typewriter, not even an IBM Electric could possibly keep up with [her] thoughts. So now [she is] keeping up with [her] thoughts.' Repeating that the computer keeps up with her thoughts, Beattie conveys a slight fascination as if this were a sudden realization – as if she had yet to reflect upon the revelation.

Patrick O'Brian (int. 1995) notes how 'some people with quicker minds than [he] can use a word processor with great speed; but upon the whole there is much to be said for the reflective pen'. Many writers, however, referred to, or were observed, using different methods for different parts and projects. Norman Mailer (int. 1964) acknowledges that his 'methods of working …

vary with each book'. Interviewing Ernest Hemingway, George Plimpton (int. 1958) writes: 'Hemingway shifts to the typewriter … only when the writing is going fast and well, or when the writing is, for him at least, simple: dialogue, for instance.' Plimpton captures how the typewriter supports Hemingway's thoughts that flow and can be transcribed without contemplation or reflection. Writing that is going well and writing that is simple reflect ways of thinking that are more productive and generative, requiring less monitoring. Françoise Sagan's (int. 1956) thinking materialized differently for *Bonjour tristesse* and *Un Certain sourire*. For the former, all she 'started with was the idea of a character, the girl, but nothing really came of it until [her] pen was in hand'. Sagan explains: 'I have to start to write to have ideas. I wrote *Bonjour tristesse* in two or three months, working two or three hours a day. *Un Certain sourire* was different. I made a number of little notes and then thought about the book for two years. When I started in writing, again two hours a day, it went very fast.'

As has been discussed, writerly perception, the activity of the senses for and while writing, also is involved in developing a text. Jose Saramago (int. 1998) maintains that he simply uses his computer 'like a typewriter'. He then elaborates: 'What I do on the computer is exactly what I would do on the typewriter if I still had it, the only difference being that it is cleaner, more comfortable, and faster. Everything is better … However, I do continue to have a strong connection – and it is natural that I should – to paper, to the printed page. I always print each page that I finish.' Saramango affirms the interviewer's immediate observation that he 'need[s] tangible proof'. While the process of transcription is supported by fluidity, expectations of its outcome are satisfied by the tactile evidence. For Saramango, cues from both non-digital and digital uses support his transcription by facilitating and legitimizing the transfer of thinking to text.

***Uses facilitate desired access to effective monitoring activities***

The findings – including many observations already cited – reveal how writers' uses of surfaces and implements facilitate desired access to effective monitoring activities. An overview of monitoring activities, derived from the findings, is offered before discussing this relationship. Monitoring entails, *inter alia*, interpreting the text being written, metacognition or awareness of the self while writing, and evaluating and crafting one's inner thoughts as they are being formed into word thoughts – and text. Writers monitor the production of their texts autonomously, recursively, purposefully, and intuitively. Material and perceptual cues in the environment, the

activity involved in writing, the inner content of the writer's own mind, and the development of the text, are all monitored by expert writers. Across the range of potential activities, however, monitoring consistently involves the writer's mind observing or becoming aware of an element of the writing process or what is being produced. The writer's attention shifts, even momentarily, from generating content to what is being written and how.

While often constructive, observing does divert the writer's awareness and attention from other tasks, particularly transcribing. Monitoring activities are helpful when contributing to the production of the written text. Comments throughout the interviews suggested that such monitoring activities might be facilitated by individual uses of surfaces and implements. Whether desiring heightened perceptual and intellectual monitoring activities, or seeking complete flow (the absence of monitoring), writers share how uses of surfaces and implements calibrate access to the spectrum of monitoring activities. In comparison to uses that facilitate desired writerly ways of thinking, those that facilitate desired access to effective monitoring activities are experienced as integrative; the lived engagement, not merely the generative thought process, is central to the utility of the surface and implement – or the perception of its disappearance, as in flow.

Many writers, as discussed, revise complete drafts on paper. Paper, whether with typeface or handwritten text, offers tactile, visual, and spatial cues that ground and enhance writers' capacities for observing – and interpreting – what has been written. The relative formative influence of each cue seems to vary according to the writer. As previously cited in the discussion of revising autonomously, Julian Barnes (int. 2000) finds that the use of paper – with typeface – affords a unique reading experience; Ha Jin prints *hard copies* on which he then uses coloured pencils. For both, the quality of the visual feedback is integrative, contributing to the interpretation of the text. Printing 'seven or eight hard copies', Jin's process also hints at a contribution in the tactile and concrete feedback of paper: a simultaneous sense of progression and opportunity offered by a clean draft.

When using keyboards, many writers find that the tactile interaction calms their metacognitive activity and deepens their perceptual interaction with the text. Like Henry Miller, Paul Auster (int. 2003) notes that his typewriter makes him aware of elements that he could not observe by sight: 'Typing allows me to experience the book in a new way, to plunge into the flow of the narrative and feel how it functions as a whole. I call it "reading with my fingers," and

it's amazing how many errors your fingers will find that your eyes never noticed. Repetitions, awkward constructions, choppy rhythms. It never fails. I think I'm finished with the book and then I begin to type it up and I realize there's more work to be done.' The tactile feedback and bi-manual haptic interaction of typing activates unique monitoring capacities for Auster.

Sometimes desired access to effective monitoring activities is null. Writers seek not only to access monitoring activities, but also to turn them off. In such instances, speed helps. Russell Banks's (int. 1998) affinity for the word processor illuminates how the rate of transcription afforded by one's implement dissolves monitoring activities. He explains: 'from the beginning I've found that I have to sneak past that internal censor who basically wants me to shut up and be silent and the best way for me to get something said has been to move real fast'. Such an instance captures how each writer has the mental capacity to enact and to succumb to the myriad ways of thinking involved while writing.

Having presented the key patterns of thought that occur when using surfaces and implements, the chapter now turns to the contextual factors that influence those relationships.

## 5.2 How Pre-existing Factors and Experiences Shape Uses of Implements and Surfaces

To any given instance of using a surface or implement, writers bring their enduring cognitive, perceptual, and motor systems. When and how surfaces and implements are used reflects the writer's mind choreographing, both automatically and purposefully; and their writerly ways of thinking, perceiving, and acting or moving. Factors of the specific context also influence those dynamics. As awareness of such contextual elements is informed by prior experiences, those too must be considered when examining uses of surfaces and implements.

In three parts, this section will present the aforementioned factors that influence when and how expert writers use non-digital and digital surfaces and implements. Section 5.2.1 focuses on the influences of what writers perceive and physically do while writing. The following section, 5.2.2, presents the orientations, impressions, and conceptions that shape writers' uses of surfaces and implements. Section 5.2.3 discusses how the conditions identified in the prior two sections shape writers' experiences of mental effort and awareness when using surfaces and implements. As this part of the study seeks to identify relevant factors, those are presented here without dividing the section between the type of surface or implement used.

Nonetheless, when a surface or implement is mentioned, its type – digital or non-digital – will always be noted or simply evident. Thus, this section focuses on the lived experiences of writers when using and choosing to use their tools.

### 5.2.1 Ways of Perceiving and Acting

Research demonstrates that much of the way we think is grounded in our capacities for perceiving and acting. From that basis, this section focuses on how writers see, hear, and feel; perceive time and space; and move their bodies and hands in ways that relate to their uses of surfaces and implements. Owing to the nature of the data, the findings reveal factors that shape the roles of writerly perception and action, as presented in Table 5.3. Examining these dimensions of the lived experience seeks to illuminate the contributions of capacities for perception and action to writers' ways of thinking when using surfaces and implements. After discussing the ways in which writers see, hear, and feel while writing, the role of time and space will be discussed. The section concludes by focusing on how uses of surfaces and implements are shaped by the writers' bodily movement and posture and, specifically, their haptic activity.

**Table 5.3. Writerly action, perception, and the factors that shape their roles in using surfaces and implements**

| |
|---|
| **Writerly perception** |
| *Factors that shape how and what one sees, hears and feels while writing* |
| Associations with the appearance of text on screen and in typeface |
| Perceived advantages of changing surfaces |
| Aesthetic preferences: desired visual cues and what one wants to see |
| Desire for control over the visual field |
| Assessments of where one reads best |
| Confidence and comfort instilled by the visual page |
| Perceptions of the blank page. |
| Established signals: perceptions that indicate anticipated information |
| Perceptions and judgements of auditory sensations |
| Affinity to making sounds |
| Preference for minimal disturbance |
| Perceived accuracy of one's inner ear |
| *Factors that shape time and space perception while writing* |
| Implications of the fact that writing can be done anywhere |
| Impressions of physical and mental distance from the writing |
| Impression of comfort provided by familiar surroundings, places that have been *warmed up* by a writer's work |
| Preferences for physical isolation and privacy, and no interruptions and distractions |

Desire for one's given space and its objects to stay in position and respond as expected

Perception of attributes being out of place

Different spaces recall different associations and facilitate access to different features that support the writing process

Desire to inhabit certain spaces, both concrete and abstract, for specific processes

Implications of the active and passive roles attributed to surfaces and implement

**Writerly action and behaviours**

*Factors involved in haptic activity*

Typing skills

Awareness of the pace and structure of one's mental activity

The requisite firmness of grip

Impression of control over the act of writing

Pace at which one is able to write

Desire to transcribe as much as possible, as quickly as possible

Pace at which one thinks

How one wishes to think

Satisfaction with how the thinking is going

Addictiveness of speed

Associations of the hands with memory

Associations of the haptic activity of holding a utensil with focus and writerly identity

Personal associations with the writing tools/devices shapes the initial activity

Associations of finger position with clear thinking

Tactile feedback with reference to the mechanics of writing

Effort involved in the appearance of text

Desire to minimise the physical effort

Impressions of how it feels and should feel to write

Impressions of the spontaneity of typing are comparable to that of speech

Different handwriting styles correspond to different mental states

Transcription allows for responsibility for the sound – control over the reading experience

*Factors involved in gross motor activity*

Postures conducive to productivity

General physical comfort is conducive for writing

Physical discomfort and injuries lead writers to make conscious decisions to change their process

Writing for many hours induces a natural fatigue

Spatial desires

Impressions imbued by physically entering the writing space

### *Seeing, hearing and feeling*

For many writers, merely being able to see the text in progress is essential. Until Edward P. Jones (int. 2013) 'can read it physically, with the eyes, it doesn't seem to exist for [him] … [He

has] a need to see it on the page, or at least on the computer screen … [He] need[s] to see the pages physically.' Erskine Caldwell (int. 1982) recalls a similar penchant: 'My father had one of those great big old-fashioned Underwoods, and the first thing I ever wrote was on that typewriter. Since then I've always had to see what I'm working on right here before me.' For Jones and Caldwell, the need to *see* the text takes priority over the details of their surfaces. The primary concern simply is to have a surface. William Trevor (int. 1989) offers an explanation for this need. He elucidates: 'I find that the more versions you see of, say, the beginning of a chapter – blue paper, white paper, typed, longhand – the more you get it right in the end. This is a tremendously long-winded way of saying you have to become familiar with what you're doing, so that in the end you practically know the whole thing by heart.' Continually seeing what he is writing enhances Trevor's processing and thus his familiarity with the work.

Specific affordances and features of given implements and surfaces were reported to affect how the text is seen and understood. Writers commented on seeing a text differently on different surfaces. Nicholson Baker (int. 2011) explains how 'you only get so far if you work by staring at a screen, because the resolution of the paper page is much higher. Your eye actually takes in things on paper more efficiently. I can fiddle around with something on a screen for days and think I'm getting somewhere, and it won't be right. Then I'll print it out and take it to bed, and instantly it's obvious what's bad about it, and I'll cross out, cross out, cross out.' John Hersey (int. 1986) remarks on his first trial with a word processor: 'It took about a month to get used to looking at words on a screen, almost as if in a new language; but once that was past, it seemed just like using a typewriter.' After sharing that she composes both in longhand and at the typewriter, P. L. Travers (int. 1982) observes: 'It's very strange. My handwriting, when I'm writing on paper before I put it onto the typewriter, is quite different – it's somebody else's handwriting. I'm always surprised to see it.'

Writers frequently noted that the appearance of the text is critical to its processing. Many of the writers interviewed mentioned expectations of how the text should look during different tasks. For Eudora Welty (int. 1973), typewriting 'helps give [her] the feeling of making [her] work objective. [She] can correct better if [she] see[s] it in typescript.' Raymond Carver (int. 1983) notes that a story 'always looks different to [him], better, of course, after it's typed up.' David Mitchell (int. 2010) moves from longhand to electronic media '[a]s soon as [he] hankers to see [his] words in a neat on-screen font'. Seeing the neat, sterile words gives writers a sense of

progress and facilitates interpretive processes. Manuel Puig (int. 1989) 'find[s] it useful to type the different drafts – going from the rough draft to the second. As you're typing a clean copy you make decisions … [He] like[s] to keep track of the first draft. [He] like[s] to see the scratching in ink. [He] do[es] a lot of scratching.' Welty, Carver, and Puig reveal how satisfying visual expectations facilitates their progress. In each instance, expectations are met as a result of the specific tool used.

Writers, however, do not always need to see the text. Some accounts magnify the tactility or feeling involved in the production of written language. Aldous Huxley (int. 1960) 'started writing when [he] was seventeen, during a period when [he] was almost totally blind and could hardly do anything else. [He] typed out a novel by the touch system; [he] couldn't even read it.' In the absence of visuals, typing offers an alternative feedback through the tactile response of the keys. Tactile engagement while writing will be explored further when discussing haptic activity. Here, the point is that the ways writers feel while writing contribute to which implements are used and how. Louise Erdrich (int. 2010) 'revise[s] as [she] type[s], and [she] write[s] a lot by hand on the printouts so they feel repossessed.' Lorrie Moore (int. 2001) recalls believing 'that everything should be written out first before being subjected to a keyboard of any sort. One needed to feel the words coming down out of your arm, out your fingers and onto the paper. Then [she] felt one should do it all again percussively to the clackety-clack sound of a typewriter.'

Like Moore, numerous writers commented on the role of sound both of the writing process and of hearing the text being written. Reporting a love for the sound of language, William Gass (int. 1977) claims that electric typewriters and print lack – and even are incapable of producing – what he wants to hear. He comments, 'I think it must have been very enjoyable – in the old days – to form letters with your quill or pen and hand. I, for example, still have an old typewriter. An electric takes away from the expressiveness of the key … Writing by hand, mouthing by mouth: in each case you get a very strong physical sense of the emergence of language … When the word passes out into the world, that particularity is ignored; print obliterates it; type has no drawl.' By contrast, Luisa Valenzuala (int. 2001) shares how hearing the production of writing while typing enables her to experience the text in a distinct, revealing way: 'If I needed a certain rhythm, I went to the typewriter. Writing by hand forced me to retype each page at least three times, and each time I retyped it I would hear the pound of the words,

and polish them until they reached the perfect intonation.' For others, the sound of typing disrupts the thinking. Marilynne Robinson (int. 2008) has 'always been distracted by the sound of a typewriter'. Robinson's experience might be explained by the sensitivity of her inner ear, which is not necessarily a disadvantage. Robert Stone (int. 1985) cites the accuracy of his inner ear when explaining that he does not need to read his work aloud to himself. 'I know what the writing sounds like', states Stone.

***Time and space***

The comments of the writers throughout the interviews emphasized that uses of writerly tools are shaped by perceptions of time and space. The fact that one may write nearly anywhere presents significant uncertainty for an already uncertain process obsessed with detail. As Nelson Algren (int. 1953) notes: 'the book I just finished could be written anywhere there's a typewriter'. Algren's comment distils and distances the writerly experience from any dependence or reliance on spatial and temporal elements. This suggests that time and space mediate the writing process but that writers' perception and in turn, their conceptions, determine the implications.

For many writers, temporal and spatial interruptions were a paramount concern. John Dos Passos (int. 1969) only needs 'a room without any particular interruptions'. Nathalie Sarraute (int. 1990) once preferred writing in cafés: 'In a café you jump in. Nobody disturbs me there and I don't hear the conversations. I had the same set-up in the country, until one day they installed a jukebox in the café where I worked, and that *does* stop you from thinking. So I arranged a cowshed across the courtyard, and every morning I go there and work.' Destinations create a sense of purpose, such that the writer cannot avoid writing. They also minimize interruptions. Erskine Caldwell (int. 1982) 'wrote several books in rented rooms because [he] had no distractions whatsoever. I could put a typewriter on the bed, sit opposite it in a chair, and write that way all day and night if I wanted to.' John Hersey (int. 1986) highlights how the surface or implement, itself, now can interrupt the process: 'I think there are a lot of things that are annoying about modern computers, particularly the ones that are interactive and keep giving you cute questions to answer as you work. That kind of thing would madden me. But I have a very simple, old-fashioned, "dedicated" word processor that doesn't inflict any of that on me.' Harry Mathews (int. 2007) explains a solution to Hersey's conundrum: 'What with e-mail and the Internet, I do most of my work in the afternoon. I write first in longhand. I copy the work on my computer, print it out, correct it in longhand, and so forth.' Interestingly, as the dates of the

interviews drew nearer to present day, the frequency of comments on interruptions increased. Javier Marias (int. 2006), David Grossman (int. 2007), and Umberto Eco (int. 2008) all cited needing spaces without interruptions.

As revealed above, writers use their surfaces and implements in ways that protect their preferred work hours and mitigate interruptions. Framed differently, interruptions become interaction – and connection. Anita Brookner (int. 1987) prefers to type what she has written at the office 'because [she] like[s] the interruptions – telephone calls, visitors'. She explains: 'I am completely schizophrenic, as I can carry on a conversation in my head while another, apparently sensible conversation, is taking place with someone who has just come into the room. At home the isolation weighs on me. It is a terrible strain.' For Brookner, the lack of interruptions becomes isolating. Gabriel Garcia Marquez (int. 1981) also raises the need to feel connected though within his writing space and with his writerly tools. Marquez 'can only work in surroundings that are familiar and have already been warmed up with [his] work. [He] cannot write in hotels or borrowed rooms or on borrowed typewriters.' Then there are writers for whom internal coherence is vital. Such writers seem unaffected by time and space. Jerzy Kosinski (int. 1972) exemplifies this: 'I write when I feel like it and wherever I feel like it, and I feel like it most of the time: day, night, and during twilight. I write in a restaurant, on a plane, between skiing and horseback riding, when I take my night walks in Manhattan, Paris, or in any other town. I wake up in the middle of the night or the afternoon to make notes and never know when I'll sit down at the typewriter.'

Writers create and access internal and external spaces while writing in order to structure the process and their minds – their ways of thinking while writing. Kazuo Ishiguro (int. 2008) 'has two desks. One has a writing slope and the other has a computer on it. The computer dates from 1996. It's not connected to the Internet.' Ishiguro reveals how the text is primarily developed in at the writing slope: 'I prefer to work by pen on my writing slope for the initial drafts … I just need to get everything down on paper … Then I plan the whole thing out from that. I number sections and move them around. By the time I write my next draft, I have a clearer idea of where I'm going. This time round, I write much more carefully.' Don DeLillo (int. 1993) 'work[s] in the morning at a manual typewriter. [He does] about four hours and then [goes] running. This helps [him] shake off one world and enter another.' E. L. Doctorow (int. 1986) manipulates the spatial construction on his surface. Doctorow 'type[s] single space, to get as

much of the landscape of the book as possible on one page'. Jonathan Franzen (int. 2010) uses spatial and temporal symbols to clarify and to visualize the development of his work. He discusses a particular instance: 'I sketched out in pencil how the chronology would work in each of the five novellas, and I was pleased to have a different structure for each of them. I also liked the way the graphs looked: A horizontal line, representing the present action, was interrupted by chunks of backstory which would rise at various slopes like something surfacing. Like a missile rising up out of the past to intersect with a plane flying horizontally in the present.'

***Bodily and haptic activity***

While Hemingway – as we have read – writes while standing, a number of writers reported writing while lying down, often in bed. Truman Capote (int. 1957) is a 'completely horizontal author. [He] can't think unless [he is] lying down, either in bed or stretched on a couch and with a cigarette and coffee handy'. Jean Cocteau (int. 1964) will 'commence to write – difficultly above [his] head in bed, with a *stylo Bic*, as a fly walks on the ceiling'. Paul Bowles (int. 1981) also writes in bed: 'Ninety-five percent of everything [he has] written has been done in bed.' At 'six-foot-four', Richard Powers (int. 2002–2003) writes '[i]n the cocoon of [his] bed'. He explains: 'My dream has always been to suspend myself in space when I write, and lying horizontal in bed is the closest to doing that. You're at the still point of the turning world. The only thing that I am touching is a cordless, one-pound keyboard … Since the computer is on the other side of the room, I don't feel as if I'm tethered to it; the machine is a distant, nonintrusive recipient of the words that I'm thinking across the room.'

Writers continue to craft prose while physically separated from or without implements and surfaces. In such instances, writers are not engaged in the literal activity of writing yet they still are active. William Goyen (int. 1976) will find himself writing while walking down the street. He explains: 'When one's really engaged deeply in a piece of work, truly writing it, it takes over almost everything else and you find you're thinking about it constantly and it's a part of everything that happens … Therefore, I know that if I've been writing all morning and I've got to buy groceries at noon, I better take paper with me, because I'm going to keep writing as I go down the street; you can write on the sack that your groceries come in, and I have!' Pure internalization proceeds independent of context or activity. Knowing this, as evidenced by Goyen, enables writers to prepare accordingly. Other writers embed such dynamics within the immediate writing space. Contained within a room, Amos Oz (int. 1996) 'write[s] in longhand

… walk[s] round the room, then stand[s] by the lectern and put[s] down a sentence, and walk[s] round again. [He] sway[s] between the desk and the lectern.' Robert Stone (int. 1985) does 'need physical order, because [he is] addressing the insubstantiality of structures – that's where the blank page starts. No top, no bottom, no sides.' Like Oz, Stone's physical activity while writing often takes him away from his writing chair: 'I find it hard to sit still. I pace a lot.'

Numerous writers commented on the intimacy, physical and psychological, of producing language through the hands. Jessamyn West (int. 1977) explained: 'I am wholly a writer with a pen in my hand … I almost feel as if I am not complete as a human being unless I have that pen in my hand … It is as if the writing comes down and what I read flows back up the veins and becomes part of me … I even like the *feel* of writing … just the muscular physical activity of writing, I love.' For Rebecca West (int. 1981), 'memory is certainly in [her] hands. [She] can remember things only if [she has] a pencil and [she] can write with it.' Rebecca West writes anything important by hand as 'your hand concentrates for you'. Similarly, A. S. Byatt (int. 2001) 'write[s] anything serious by hand still'. She adds: 'There's that wonderful phrase of Wordsworth's about "feeling along the heart", and I think I write with the blood that goes to the ends of my fingers, and it is a very sensuous act.' These three writers suggest that the focused act of writing by hand, the sensation of holding a utensil, triggers mental activity in ways dissimilar from that of typing on a keyboard.' [C]oncerned that her spoken words would later betray her in print', Cynthia Ozick (int. 1987) requested to make her response to questions by typing. Reflecting on the use of the typewriter for the interview, she reveals: 'One thing I've learned: Speech is far more guarded than talking through one's fingers.' Ozick suggests that the act of typing uniquely triggers the release of mental activity.

Throughout the interviews, writers commented on the manual effort of writing. Mark Helprin (1993) 'used to write exclusively with one particular Montblanc fountain pen, although lately [he has] had to use a roller-tip fountain pen, because [he] find[s] it harder and harder to control the fine muscles of [his] right hand during prolonged periods of work'. He explains the implications: 'If a pen starts to drag, I lose nervous control and find that I bear down on the paper so hard that I put holes and rip channels into it.' J. G. Ballard (int. 1984) finds that longhand is 'less tiring than a typewriter'. Ballard will 'do a first draft in longhand, then do a very careful longhand revision of the text, then type out the final manuscript. [He] used to type first and revise in longhand, but [he] find[s] that modern fiber-tip pens are less effort than a typewriter.'

Robertson Davies (int. 1989) notes that 'you can only write so long with a pen before your hand becomes tired, and then your invention begins to tire'. Hand fatigue also limits Mario Vargas Llosa's process. In the morning, the 'most creative hours', Vargas Llosa always writes by hand but never 'more than two hours like this – [her] hand gets cramped'. The 'pure enjoyment' that William T. Vollman (int. 2000) once experienced while writing is 'not there quite as much because [his] hands hurt all the time when [he] type[s]'. Having been diagnosed with carpal tunnel syndrome, Vollman turned to notebooks 'because it doesn't hurt [his] hands to write in a notebook'.

A number of writers commented on the appearance of their handwriting: the production of haptic activity. Italo Calvino (int. 1992) discusses his two distinct handwriting styles: 'I make a number of additions, interpolations, that I write in a very tiny hand. There comes a moment when I myself can't read my handwriting, so I use a magnifying glass to figure out what I've written. I have two different handwritings. One is large with fairly big letters – the *o*s and *a*s have a big hole in the centre. This is the hand I use when I'm copying or when I'm rather sure of what I'm writing. My other hand corresponds to a less confident mental state and is very small – the *o*s are like dots. This is very hard to decipher, even for me.' V. S. Naipaul (int. 1998) noted that he 'began to write with a pencil … [when he] didn't feel secure enough'. Writers perceive and reveal a relationship between their mental state and haptic activity. The appearance of handwriting, its evidence of mental states, may be erased. William F. Buckley Jr (int. 1996) explains: 'It happens that my handwriting is sort of malformed. In fact, my father, when I was fifteen years old, sent me a typewriter with the instructions learn to use it and never write to him in longhand again. So I learned the touch-type system, and by the time I was twenty-three it wouldn't occur to me to write anything by hand.'

It was not uncommon for writers to mention a change in the implement used. Günter Grass (int. 1991), for example, went 'back to writing the first draft by hand!' For other writers, however, change is daunting. Tom Wolfe's (int. 1991) 'wife gave [him] a word processor two Christmases ago that still stares at [him] accusingly from a desk in [his] office. One day [he is] going to be compelled to learn how to use it. But for the time being, [he uses] a typewriter.' Camilo Jose Cela (int. 1996) explains why he 'always write[s] longhand': 'The truth is I don't know how to type and I don't have a computer. There is a computer in the house but my wife uses it, not me, because I'm afraid it will give me cramps. It's true! Confronted with such

machines – computers, even automobiles – I'm like a person from a very remote and distant area.' Having composed 'directly on a keyboard' since college, T. Coraghessan Boyle (int. 2000) found that 'the switch to computer was simply a psychological matter – fear of change'. He elaborates on this fear: 'As the great American philosopher, Woody Allen, says, change equals death. My biggest fear of the computer had been that I would tend to toy with it rather than work in the way of iron discipline with which I try to drive myself, but that hasn't been much of a problem – and, of course, the ability to edit instantly and produce a perfect copy appeals to the Dutch housewife in me. On the downside, my fingers have grown weaker and my eyes are slowly being destroyed.'

### 5.2.2 Writerly Orientations, Impressions and Conceptions

In response to research question 2a, the previous section reviewed factors that shape how writers perceive and move in ways that shape their uses of surfaces and implements. The implications of those factors will be developed in this section, which responds to research question 2b. The focus here is on the repeated ways of thinking that both result from ways of perceiving and acting, and develop through reasoning. As discussed in the literature review, Chapter 2, instances of using surfaces and implements are reference and context dependent. Identifying the range of thought patterns and understandings that endure in writers' minds seeks to deepen explanations of the thinking and decisions that result in uses of surfaces and implements. Through that lens, the findings fall into three categories: orientations, impressions, and conceptions. The first category, orientations, includes general mental positions and capacities that shape or constitute writers' ways of thinking about their surfaces and implements. Overriding or changing one's natural orientations and their implications, if possible, often requires greater mental effort. Writerly impressions, the second category, entails views derived from perception and intuition. The third category, conceptions, includes understandings that primarily reflect conscious reasoning. While impressions often are the result of external stimuli and not easily explained in language, conceptions are internalized over time and can be explained clearly (Kahneman, 2011).

Thus, this section will discuss which orientations, impressions, and conceptions contribute to uses of surfaces and implements and how. Many comments quoted thus far have included examples of these; some will be referred to – though not repeated – here. Which orientations, impressions, and conceptions were influential, has been delineated in Table 5.4. As many topics took the form of both an impression and a conception, those categories have been

integrated within the table so that the substantive range of what writers think is emphasized. That organization clarifies which ways of thinking contribute to writerly tool use. How these ways of thinking form and affect uses of surfaces and implements is discussed in the following subsections.

**Table 5.4. Orientations conceptions, and impressions that shape or determine the use of surfaces and implements**

| |
|---|
| **Writerly orientations** |
| Openness to new ideas, processes, devices, change |
| Patience |
| Willingness to modify or change behaviour |
| Self-awareness |
| Self-regulation |
| Desire for control, stability and consistency, perfection |
| |
| **Writerly impressions and/or conceptions of …** |
| *One's own:* |
| Personality |
| Understanding of what it means to be a writer |
| Writerly ways and pace of thinking |
| Writerly routines, habits, rituals and methods |
| Writing process, particularly transitions between stages |
| Familiarity with available surfaces and implements |
| Surfaces and implements (e.g. their reliability and influence) |
| *Valuable knowledge bases* |
| Foundational writerly knowledge (e.g. senses of rhythm, pacing, and language) |
| Intuitive knowledge of what you are writing |
| *Social influences* |
| Mentors, editors, peers, parents, children, spouses, teachers, and professors |
| *Material and technical elements* |
| Whether one has access to surfaces and implements |
| Utility and function of surfaces and implements and their features |
| Associated behaviours and attitudes |
| *The writing process, including:* |
| What writers need |
| What is proper |
| How writing occurs |
| The value of manuscript material and the preservation of work |

The purpose and power of writing

The nature of the text being written

The utility of different writing processes

The challenges and joys of writing

*Writerly insights*

Environmental order and physical mobility facilitate the mental activity demanded by a blank page

Double distancing – separation from where one normally writes and about what one is writing – benefits the writing process

Manuscript pages reveal what is productive versus what is wasteful – when energy has been wasted

Words and phrases are perceived differently as different stimuli (e.g. visual, oral).

Different uses of surfaces and implements reveal different things at different stages of the process

Intrusions (e.g. machines) are not helpful when producing words

Maintaining the strength of one's fingers and eyesight

### *Orientations*

Patience, openness, and willingness to change, self-awareness and capacities for self-regulation, as well as cultural factors – all these shape and, at times, constitute orientations that affect how writers engage with surfaces and implements. Identifying an orientation deepens the explanation of its influence, as in the case of those that affect writerly uses of technology. In contrast to the individual particularity of impressions and conceptions, orientations were exhibited across writers and germane not solely to writing. This suggests that influential orientations are deeply engrained in the writer and likely not to be the result of writerly experiences only. That the implications of orientations are more pervasive throughout the writing process and assertively articulated illustrates how such ways of thinking are deeply instrumental, yet not questioned.

Cultural factors, in particular, capture how an orientation emerges and resolutely influences a writer's way of thinking with regard to their surfaces and implements. Cultural views inform how a number of writers relate to text on surfaces that has not been published. Naguib Mahfouz (int. 1992) 'tear[s] up all the old reworkings and throw[s] them away … [as] it is simply not part of [his] culture to preserve notes'. According to Kenzaburo Oe (int. 2007), '[i]n Japan if a writer dies and leaves an unfinished manuscript someone will publish it'. Owing to that reality, Oe holds clear plans for his manuscripts and notebooks: 'Before I die I want to burn all of my unfinished manuscripts and all of my notebooks. I would like to select the books that I want reprinted and everything else I want not to be reprinted.' Oe's cultural orientations shape his views on the permanence and privacy of his work in progress, and the writing process as a whole.

Asked about the feeling of sitting at the typewriter, John Cheever (int. 1976) reports: 'the sense is of one's total usefulness. We all have a power of control, it's part of our lives: we have it in love, in work that we love doing. It's a sense of ecstasy, as simple as that. The sense is that "this is my usefulness, and I can do it all the way through". It always leaves you feeling great. In short, you've made sense of your life.' General desires and self-awareness both influence how Cheever experiences his typewriter. Cheever indicates that these orientations, as a 'part of our lives', reverberate throughout all activities. His words reveal how their implications are still felt and understood on an individual basis.

***Impressions***

As noted, impressions include thoughts and ways of thinking that have developed from intuition and the perception of external stimuli. While stimuli bound, the formation of impressions is shaped, in varying degrees, by orientations cited above and conceptions that will be discussed below. Impressions reveal which and how external stimuli and unreasoned views affect writers' thinking concerning their uses of surfaces and implements. Often, impressions attempt to articulate an experience, a relationship with various accessible affordances. What affects subsequent behaviour often are the complete experiences of which impressions are a component. Examining the role of the stimuli in the given experience illuminates how impressions affect uses of surfaces and implements.

Nicholson Baker (int. 2011) came to 'love typing, actually – the sensation of typing on a keyboard or on an old-fashioned typewriter' after having 'decided that a real writer typed his drafts'. Baker's expectations of what a writer should do ground his impression of typing, which reinforces his positive experience of the activity. His appreciation for the sensation seems tied to a writerly nostalgia and a precise tactile feedback, which together render typing fundamental to his real and imagined production of written language. Ann Beattie's (int. 2011) impressions prevent her from using certain keys on certain keyboards. She explains: 'I can't compose with the kind of keys that are on the portable. I just can't. So I have these plastic twenty-dollar keyboards that I plug in and then it makes it work like a real typewriter.' Beattie's solution suggests that she, like Baker, acutely feels the activity of typing and holds a precise expectation of how it should feel while composing. Of significance in both Baker's and Beattie's impressions of typing is how the experience and anticipation of tactile feedback underpin and sustain their uses of keyboards – and which keyboards they use. Both writers benefit from the engagement of

their perception when not disrupting mental activity.

Akin to Baker's views on a 'real writer', impressions of what is proper were cited by a number of writers. In response to whether he keeps a notebook, E. M. Forster (int. 1953) replies, 'No, I should feel it improper.' The next question is: 'But you would refer to diaries and letters?' To this, Forster answers, 'Yes, that's different.' He does not, however, explain why. James Thurber (int. 1955) 'still write[s] occasionally – in the proper sense of the word – using black crayon on yellow paper and getting perhaps twenty words to the page.' Thurber too does not explain why his *proper* understanding of writing shapes his practices. The lack of explanation from both writers suggests that their sense of what is *proper* intuitively shapes their surface and implement use.

Impressions of what is proper illuminate how self-perceptions, if inaccurate or unreasoned, also underpin impressions of the writing process. Truman Capote (int. 1957), for example, thinks of himself 'as a stylist, and stylists can become notoriously obsessed with the placing of a comma, the weight of a semicolon'. Capote notes that he 'does not use a typewriter and write[s] [his] first version in longhand (pencil) … [followed by] a complete revision, also in longhand'. Capote's view of himself interrelates with his impression of the writing process, which in turn highlight his continuous use of pencils while writing. The control and stability afforded by a pencil fulfil Capote's anticipation of endless corrections and affirm his writerly identity in the practice.

Many writers hold unfounded or narrow impressions of technology. Those concerning its influence, reliability, and utility, in particular, shape how writers view using digital surfaces and implements for writing. John Barth (int. 1985) *supposes* that digital technologies have influences even when not used by the individual: 'I suppose that my fiction will be word-processed by association, though I myself will not become a green-screener.' Nicholson Baker (int. 2011) 'had a couple different laptops because they were not all that dependable'. Ironically, perceiving laptops as unreliable leads him to accumulate more instead of trying alternatives. Julian Barnes (int. 2000) uses his computer 'for e-mail and shopping'. Like Barnes, Roberto Calasso (int. 2012) does not use the computer for the immediate processes of writing: 'The computer I use for other things – the Internet, reading.' Having formed their impressions, these writers seek neither to question the rationales nor to explore alternatives. Impressions exist as black boxes framed by

perceptual and intuitive systems. Here the implications of external stimuli prove secondary to the effects of exiting these existing systems.

***Conceptions***

Throughout the interviews, writers shared understandings that were neither intuitive nor bound to external stimuli; these included both direct understandings *of* their surfaces and implements and understandings of writing *within which* surfaces and implements were mentioned. Dissimilar from impressions, these understandings were distinguished by having been contemplated over time and by references to theoretical ideas or constructs. The writerly ideas and constructs mentioned were diverse in both the views taken and the topics covered. Accordingly, the findings revealed that writers internalize their uses of surfaces and implements both directly and indirectly, with reference to the experience of writing and implications for each use. Such conceptions illuminate how writers render the abstract, subjective nature of their own writing. How writers come to associate over time with their surfaces and implements and how those associations shape subsequence uses is revealed in the formation and implications of relevant conceptions. Having outlined the conceptions that inform writerly tool use in Table 5.5, this section will discuss their formation and implications briefly to consider how these enduring thoughts and ways of thinking contribute to uses of surfaces and implements in specific situations.

Conceptions that contribute to uses of surfaces and implements evolve through the abstraction of elements of writing or the uses and tools themselves, all within an individual's subjective experience. Aspects of the writing process, for example, frequently informed and framed how writers thought about surfaces and implements, and vice versa. Many writers shared that all you needed to be a 'writer' was a surface and an implement. Frank O'Connor (int. 1957), for example, 'became a writer because you could be a writer with a pencil and a penny notebook'. According to William Faulkner (int. 1956), '[t]he writer doesn't need economic freedom. All he needs is a pencil and some paper.' Reducing the needs of writing to surfaces and implements illustrates how writers seek to ground the complexity of the process to concrete objects. Orhan Pamuk (int. 2005) adds time and place: 'I need solitary hours at a desk with good paper and a fountain pen like some people need a pill for their health.' Writing objects provide a constant in an unpredictable, solitary art. Mary Lee Settle (int. 1990) clarifies her conception of a writing formula: 'There's no formula ... You are still in a room alone; you are still facing the

white paper. There's no difference.' There may be no formula but there always are surfaces and implements. '[A]ctresses grow old, dancers grow wobbly, whereas a writer still has a typewriter' states P. L. Travers (int. 1982). These writers reveal how the relative reliability of surfaces and implements invites their projected desires for clarity and control.

Ingrained within their ways of thinking, conceptions shape which aspects of surfaces and implements writers purposefully attend to and how. 'More than a commitment to the art or to the craft … it is a commitment to being alone in a room' declares Orhan Pamuk (int. 2005). This conception underpins his attention to the mobility of writerly tools to use them within uninterrupted isolation. Dorothy Parker's (int. 1956) conceptions of her own knowledge ground her views of her writing format. She explains: 'I wrote in longhand at first, but I've lost it. I use two fingers on the typewriter. I think it's unkind of you to ask. I know so little about the typewriter that once I bought a new one because I couldn't change the ribbon on the one I had.' Writers also project self-conceptions in ways that shape how they utilize their surfaces and implements. Christopher Isherwood (int. 1974) reports, 'When I was young, I was absolutely fanatical. I wrote in longhand, and I couldn't bear for there to be any erasures on the paper, and since this was before all these wonderful breakthroughs with Liquid Paper, etc., I used to scratch words out with a razor and then polish the paper with my thumbnail and write it in again.' Joseph Heller (int. 1974) does not think of himself 'as a naturally gifted writer when it comes to using language'. He explains the implications: 'I distrust myself. Consequently, I try every which way with a sentence, then a paragraph, and finally a page, choosing words, selecting pace (I'm obsessed with that, even the pace of a sentence). I say to myself what I hope to put down on paper, but I hope not aloud.'

### 5.2.3 Effort and Awareness Involved in Repeated and Formative Past Experiences

The previous two sections, 5.2.1 and 5.2.1, presented which and how pre-existing ways of perceiving, acting, and thinking independently contribute to how implements and surfaces are used in a given situation. Many writers, however, commented on those factors collectively – either explicitly or implicitly in comments on repeated experiences. These comments illuminated how individual means of perceiving, acting, and thinking are orchestrated in ways that, applied together, shape writerly tool use over time. Part of what determines how pre-existing capacities and factors are orchestrated are the attention and effort required and applied. The range spread from intuitive and automatic to purposeful and effortful. These categories should not be taken as

absolutes; writers' enduring experiences entail endless choices involving varying degrees of effort and awareness.

For purposes of clarity, this section will discuss writers' experiences that were either intuitive and automatic or purposeful and effortful. Turning to comments on the lived experience aims to capture how writers' ways of perceiving, thinking, and acting are continually and collectively choreographed. Together, the following sections will discuss how the experience of the effort and attention involved in using implements and surfaces shapes specific situations. These sections focus on how writers re-enact experiences and apply consistent levels of effort and attention when repeating the tasks involved, which relate in distinct ways to uses of surfaces and implements.

***Intuitive and automatic***

Throughout the interviews, writers commented on continually experiencing the production of content in ways that involved neither effort nor a confident awareness of what was occurring. Primarily reported by those using keyboards, these experiences are characterized by an awe regarding where the content comes from and by little conscious awareness of what occurs as the writer completes a text. Salman Rushdie (int. 2005) recounts being 'electrified by what was coming out of [his] typewriter' – an experience that leads one to 'believe that the writing comes through you rather than from you'. William Maxwell (int. 1982) finds that sentences 'come from another place'. Sitting 'head over the typewriter waiting patiently, empty as a bucket that somebody's turned upside down', Maxwell 'wait[s] for a story to come from what you could call [his] unconscious. Or it could be from the general unconscious'.

While Rushdie and Maxwell experience automation in the *generation* of new content, Deborah Eisenberg (int. 2013), Janet Malcolm (int. 2011), and Richard Price (int. 1996) emphasize the automation in the *production and crafting* of the text. For Eisenberg, using her laptop is like playing with a ouija board: 'I write down some little thing, and then eventually something comes out of that, or doesn't … But there is nothing in my mind when I'm writing until I'm well along in a piece. Until then I have no ideas, no conscious feeling. I'm a person with virtually no feelings.' When typing her notes, Malcolm is 'not all that conscious of what [she is] doing as [she does] it'. Richard Price recalls slightly more processes though the crafting still is intuitively realized: 'Typically, what I'll do is write a page, reread it, edit it, write half a page more, and then I'll go back to the very first thing I wrote that morning … I don't know

whether I'm editing, reediting, or writing something new, but it's kind of a creeping, incremental style of writing. I always sort of half-know where I'm going.' Each of these writers has the knowledge and skills both to create and to craft their work intuitively. For those with such writerly expertise, repeatedly experiencing little awareness of what is occurring suggests that their thinking, acting, and perception are orchestrated with complete attention to making the writing occur.

Displacing such intuitive internalization, some writers locate their experiences within the surfaces and implements themselves. Guillermo Cabrera Infante (int. 1983) relates how certain interactions with one's tools project the thinking while writing onto the device. Cabrera types on a 'brand-new Praxis 35, an Olivetti made in Japan – the old Rome–Tokyo axis now become a merger'. His 'problem is that this typewriter, instead of becoming unruly like all [his] old typewriters and old girlfriends, started out imitating [his] wife, Miriam Gómez, by trying to do [his] thinking for [him]'. Cabrera's new Praxis 35 allows him to create and to craft fluidly, only becoming aware of what he is producing – what he is thinking – after it has been transcribed.

***Effortful and purposeful***

In contrast to experiences of writing as automatic, many writers – including those reporting intuitive processes – discussed the daily effort and purposeful thinking that writing requires. That writing requires significant mental effort, however, is both obvious and has been established. Of relevance to this thesis are the relationships of the findings to uses of surfaces and implements; recollections of writing as effortful and purposeful are removed from uses of surfaces and implements. Deborah Eisenberg (int. 2013), for example, purposefully asks herself: 'What is this and what is this and what is this?' Posing the conscious directives does not require her writerly tools. Alberto Moravia (int. 1953) 'trust[s] in inspiration, which sometimes comes and sometimes doesn't … [but he does not] sit back waiting for it. [He] work[s] *every*day.' Resolve and self-control exist and are developed independently of transcription. In response to whether he can detach his mind from his work, Hemingway (int. 1958) replies: 'Of course. But it takes discipline to do it and this discipline is acquired. It has to be.' Italo Calvino (int. 1992) notes the challenges of selecting words: 'I have to hunt for words when I speak, and I have the same difficulty when writing.' Moravia, Hemingway, and Calvino reveal how the significant mental effort and discipline required while writing occurs irrespective of uses of surfaces and implements.

Ultimately writers continue not to associate strenuous and effortful experiences with surfaces and implements. In such comments, the emphasis is on the internal experience and its effective operation. Milan Kundera (int. 1984) explains how '[t]oday one can compose music with a computer, but the computer always existed in composers' heads … It is nearly the same with the novel; it too is encumbered by "technique", by rules that do the author's work for him: present a character, describe a milieu, bring the action into its historical setting, fill up the lifetime of the characters with useless episodes. Every change of scene requires new expositions, descriptions, explanations. [Her] purpose is … to rid the novel of the automatism of novelistic technique, of novelistic word-spinning.' Expert writers make all the final decisions. Kundera's observations and intent capture how attention and effort underpin which decisions are made and how. Whether this, *inter alia*, holds true for how student writers use their surfaces and implements is explored in the following chapter.

## Chapter 6: Qualitative Fieldwork with Student Writers

> *I can't remember a time when technology wasn't a part of my writing process to know what it would be like without it.'*
>
> – Emily Sacher

> *When you do understand your tools, you are able to get your thoughts just 100% focused on substance.*
>
> – Uday Sing

This chapter will present and discuss the findings and analysis of the data collected from the five student cases introduced in Chapter 4. As noted, the aims of this stage of the study are to identify and to assess how a sample of students' uses of surfaces and implements relates to their writerly ways of thinking, and which and how pre-existing factors are associated with those relationships.

The data collected from the students reveal certain elements that mirror those observed in the expert writers. For one, the student data revealed pre-existing factors not unique to a given situation or use. Unlike the experts' ways of perceiving, and their attitudes, impressions, and conceptions, however, the students' relevant pre-existing factors reflected their roles as learners within a formal education system, and as participants in a world where technology always has been available and accessible – as captured above by Emily and Uday. Second, like the expert writers, students were not always explicit about when and why a surface or implement was used, particularly – as noted – early in the data collection process. However, owing to differences in the data collection methods used by the students (in comparison with those of the expert writers), instances of ambiguity or tacit understandings could be clarified or elicited through more direct questioning or questioning from different approaches and in different media. Third, the two points drawn from the findings from expert writers that apply to that entire chapter (Chapter 4) – the concept of writerly ways of thinking and ambiguous applications of writerly terms (e.g. drafting) – similarly apply to the findings presented in this chapter. The outlined elements of 'writerly ways of thinking' stand and, as in the previous chapter, terms and concepts are clarified as necessary.

As introduced briefly above, the student data also differ from those of the expert writers in substance and form, owing to both the nature of the participants and the data collection methods. Among these differences, three that pertain to all five cases are noted here. In addition

to the presence of technology throughout their writerly lives as well as their time as students, the participants all use iPhones and Apple computers for their text-based communications and typing their academic assignments. While many aspects (including the keyboard and screen size) differ from one type of Apple computer to the next, all Apple devices offer the same applications for managing and syncing text-messages, emails, and documents (iMessage, Mail, and Pages and iCloud, respectively). The findings below detail which of these applications each student uses and how those diverse uses relate to writerly ways of thinking. Further, as frequently communicated and revealed, the students do not use keyboards and screens as non-digital implements and surfaces for only composing. This, however, is a matter of emphasis as the expert writers also referred to using computers for activities other than composing. How each student's inclusive views and broad uses of keyboards and screens shape their ways of thinking while writing is detailed below. The final point of difference to note here is the comparatively influential role of education in how students think while writing – and how those ways of thinking, in turn, shape their writerly tool use. By contrast to the expert writers, the student writers all frequently referred to versions of writing that they received through formative experiences throughout high school and college. Within and through those frameworks and concepts, they have created and personalized their uses of surfaces and implements.

In five sections, this chapter will present the findings and analysis from each student in response to the study's research questions, as refined for this part of the study – and presented in Table 6.1.

**Table 6.1. The research questions applied to the students**

1. How does the student's use of writing implements and surfaces relate to his or her writerly ways of thinking while composing?
    a. When and why does the student use non-digital writing implements and surfaces?
    b. When and why does the student use digital writing implements and surfaces?
    c. How are writerly ways of thinking supported by uses of surfaces and implements?
2. What are the students' pre-existing behaviours and ways of thinking, and past experiences of writing that contribute to how they use implements and surfaces in specific situations?
    a. What are the factors that shape how the students perceive and act when using surfaces and implements?
    b. What are the orientations, conceptions, and impressions that inform how the students use their surfaces and implements?
    c. How do experiences of the effort and attention involved in writing relate to uses of surfaces and implements?

Though there is some overlap, RQ1 primarily seeks to delineate the relationships between factors, while RQ2 aims to identify pre-existing factors. Owing to the nature of stage 1, both sets of questions were applied across a database for reasons that were discussed. However, an objective and opportunity of the in-depth cases in stage 2 was to identify relationships and their interrelationships on an individual basis. Thus, Sections 6.1–6.5 begin with relevant, writerly background to introduce the student before presenting their uses of surfaces and implements, and the ways in which they support writerly thinking. Within each of the subsections, RQ2 also is addressed. Factors and past experiences that influence the relationships identified between writerly tool use and ways of thinking while writing are incorporated where appropriate. This structure reflects stage 2's sequence of data collection methods and the underpinning logic, in that the students' writerly backgrounds illuminate the ensuing reports on their uses of surfaces and implements. Further, as the findings reveal, each student's writerly background and identity continue to shape their current practices. As with the findings presented in the previous chapter, idiosyncrasies and common themes emerge. Accordingly, each of the five sections seeks to convey the spread and specificity of individual uses while composing, all through identified themes.

## 6.1 Amy

**Table 6.2. Overview of Amy's uses of surfaces and implements**

| |
|---|
| ***When and why does Amy use non-digital writing implements and surfaces?*** |
| 1. Simplify the actions, expectations, and functions of tools |
| 2. Distil and capture thinking |
| 3. Leave and relieve negative emotions |
| 4. Accommodate unpredictable temporal and spatial note-taking |
| ***When and why does Amy use digital writing implements and surfaces?*** |
| 1. Maintain connection to and in control of her digital life |
| 2. Conceptually inform semantic and rhetorical decisions |
| 3. Receive thinking: accept the tension, and deliver the release |
| 4. Perpetuate efficiency |
| ***How Amy's uses of surfaces and implements support her writerly ways of thinking:*** |
| 1. Appease emotional concerns |
| 2. Distil and receive thinking |
| 3. Through the aggregation and accessibility of past work |
| 4. Inform rhetorical and substantive decisions |

Amy did not speak until she was 4 years old. She recalls having to 'go to therapy for that for a pretty long time'. Owing to having 'a huge speech impediment', she maintains that she has

been ‘far more expressive through written language, always‘, and has ‘clear memories of learning how to write … [by] practising cursive letters on pieces of comically large-lined paper’. In those early years, Amy was not given ‘any instruction other than to write; spelling and grammar were corrected later on, but not emphasized’. Amy was ‘inspired and engaged in academic writing in high school, when it felt like more emphasis was placed on making each essay unique and exceptional’. By contrast, Amy finds that ‘in college … a lot of it is what you have to do … and checking off the boxes’. Her current writing workshop ‘is a little more freeform’, while her workshop last semester, which she ‘loved, had a really rigid set of rules’.

For Amy, writing is ‘all about trial and error and putting in the hours’. She appreciates ‘that the traditional academic essay is extremely predictable and rhythmic with moments of build up, thick paragraphs of information, deliberate segues, rewarding and comprehensive conclusions … [and how] academic essays fully embrace the form as opposed to trying to subvert it or manipulate it’. Amy finds the form ‘simple, and formulaic, but extremely effective, which makes even super scholarly texts somehow comfortable and familiar’. Nonetheless, she finds it ‘insane to have a mode of expression where the boundaries have already been established’. Amy’s pursuit of a double major in gender studies and creative writing is driven by ‘a very personal mission to write about … [an idea captured by] this great quote … “If someone were to write about the experience of being a woman in a female body then that would crack the world open.”’

The following two sections will discuss when and why Amy uses non-digital and digital surfaces and implements. As introduced in Table 6.2, the findings suggest that Amy’s uses ultimately support her writerly ways of thinking in the following four ways:

1. by appeasing emotional concerns;
2. by distilling and receiving her writerly word and non-word thinking;
3. through the aggregation and accessibility of past work;
4. by informing rhetorical and substantive decisions while composing.

### 6.1.1 Non-digital Uses of Surfaces and Implements

This section will show how Amy uses non-digital surfaces and implements to simplify the actions, expectations, and functions of her writing objects and tools; distilling and capturing thinking; leaving and relieving negative emotions; and accommodating unpredictable temporal and spatial elements – as outlined in Table 6.3.

**Table 6.3. When and why Amy uses non-digital surfaces and implements**

| ***Non-digital surfaces and implements***<br>Pens, pencils, and notebooks, often Moleskin notebooks | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Simplify the actions, expectations, and functions of writing objects and tools** | |
| When reading source materials and editing on paper | Preference for real books; ease of note-taking; handwritten markings convey progress |
| When brainstorming while physically present for unrelated activities | Utensils are less invasive: facilitate deep thinking and retreating from surroundings |
| **2. Distil and capture thinking** | |
| When capturing and re-working word thoughts | Such thoughts are infrequent but still require revisions; lined moleskins satisfy aesthetic concerns and mitigate anxiety induced by the blank page; easier to write in margins |
| When creating, elaborating on, and refining details for scenes, images, and emotional revelations, and structural and temporal elements | Not to forget; enhanced laser vision and haptic flexibility; handwritten text begs to be edited |
| **3. Leave and relieve negative emotions** | |
| When making sure the bases are covered | Reduces anxiety about not knowing a text's progression |
| When stuck on ideas or aspects being typed | Writing by hand catalyses and facilitates problem solving |
| **4. Accommodate unpredictable temporal and spatial elements** | |
| When bored or capturing prose | Such instances are unpredictable; writing by hand creates deeper engagement |
| When making line-by-line edits in a draft | Easy to cross out words, comment in the margins |

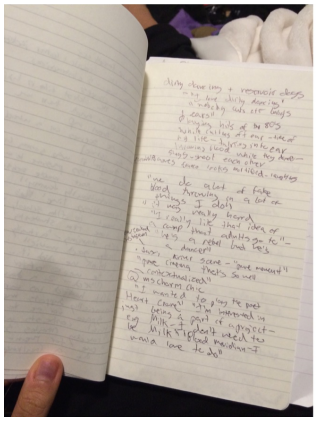


**Image 3. Amy reading over notes.**

Amy is 'particular about notebooks' but suspects that is 'more of an aesthetic concern'. She uses the small, cardboard Moleskin notebooks with lines – blank pages would give her 'so much anxiety'. For reading, Amy likes 'real books' and tends to make notes in them, to which she does return. She 'used to use a Kindle but hated it'. Amy maintains that she 'uses non-digital implements and surfaces primarily for note-taking and brainstorming'. She does 'a lot of note-taking while doing other things' particularly 'in class about things not pertaining to the class'. Though Amy 'refuse[s] to plot essays beforehand', she 'will take notes about structure and be like you want to do this scene and then get to this emotional revelation and then you want to end in this area … but a lot of times it's just sentences and reworking sentences'. Amy knows 'why you need an outline but it just doesn't interest' her. Though she thinks outlining is 'lame', she acknowledges that she 'never learned to outline at all'. Amy tries to capture her prose on paper because 'it just doesn't happen that often'. Though Amy

can ‘write in one sitting’ what she intended to write, sometimes she ‘won’t be able to get the words right’. Then, she starts note-taking, when ‘stuck on something … to start problem solving by just writing it out’.

Amy’s uses of non-digital implements and surfaces for note-taking and brainstorming tend to follow or accompany creative and generative thinking, which she illustrated through two scenarios. In the first, which she described as generative, she ‘pulled out a notebook after getting very anxious about not knowing the emotional progression of a character in a story’: ‘In the notebook, I stacked emotional states (confident, self-aware, scared, etc.) to make a timeline – not as an outline for the story, really, but more to note all the points to hit – not corresponding, yet, to any specific plot points, but just not to forget and to make sure to cover these bases.’ In the second creative and generative scenario, Amy was in class and ‘bored and decided … to think of some pretty images for a story, that would fit in with scenes that had already been started’. Amy ‘thought about recent experiences and visuals … and then rearranged words and sentences’ until she ‘had nice, succinct, evocative and rhythmically pleasing sound bites’.

If Amy has time when writing her essays, she spends ‘a few weeks before just thinking … jotting down notes – ideas or questions or fully formed sentences’. She will ‘begin brainstorming creative works in notebooks, usually in margins … often problems … to write through in the completed work’. Though brainstorming is ‘a bit of a mystery’ to Amy, she does have a process that depends on putting pen to paper: ‘I always start with a concept, a character, a voice, or an image that’s very much robbed from real life.’ She elaborates: ‘The voice is the overall tone of the narration … Then I need to know why the voice is speaking … [Once] I know my character’s deepest and darkest motives, I need to figure out how they can show them to the reader … that I work through by sitting down and actually writing.’

Amy finds writing by hand to be ‘a lot harder’, more physically demanding, and slower. She explains: ‘I start and stop and it takes me a lot more time to write the same amount of material.’ According to her, there ‘definitely’ is a relationship between thinking and the physical act of writing by hand. When ‘you are writing by hand, it feels more blood sweat and tears, it feels like you are really pushing yourself through every sentence.’ For Amy, the physicality extends to her perception of the text and, consequently, its editing. Amy’s ‘edits are almost always done by hand on the printed page, with line by line edits (crossing out words, adding comments in margins, etc.)’. Her ‘teachers still do line edits by hand as well’. Amy offers a

justification: 'when you see something by hand, it feels more personal and more like a work in progress, begging to be edited … if you write a shitty sentence, you will not want to look at – to have written that shitty sentence … and have to change it'.

### 6.1.2 Digital Uses of Surfaces and Implements

This section will discuss how Amy uses digital surfaces and implements primarily for maintaining connection to and in control of her digital life – conceptually informing semantic and rhetorical decisions, prompting and receiving thinking, accepting the tension and delivering the release, and perpetuating efficiency. These are outlined in Table 6.4.

**Table 6.4. When and why Amy uses digital and bi-manual surfaces and implements**

| ***Digital and bi-manual surfaces and implements*** iPhone and MacBook | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Maintain connection to and in control of her digital life** | |
| Before beginning and while writing | To procrastinate; to take a break |
| After closing other applications | Not to have trouble focusing |
| Blocking time to work, often in bed | Must be comfortable; minimize self-consciousness |
| **2. Conceptually inform semantic and rhetorical decisions** | |
| When consuming content: inspiration and sources | Technology delivers much of the content that inspires writerly thoughts |
| When accessing earlier work while planning | Digitized material is aggregated and easily accessible |
| When developing substance of the text, representing/trying to represent the lived experience | Technology is embedded in life, has resulted in an entirely new lexicon; influences relationships and how people write, how often, to/for whom |
| **3. Prompt and receive thinking: accepts the tension and delivers the release** | |
| When starting by typing a prompt | Working from a blank document is intimidating |
| When transcribing with a word processor | Speed and ease, ultimate format, renders text accessible and malleable; writing can reveal where text/content is going (typing is low risk) |
| When drafting: laying groundwork, pausing and re-reading sentences | To create the tension: carried by 'flow'; easier to type towards an idea, letting the energy of a sitting push her |
| When drafting: writing the release – the crux of her argument | Easier to get to the main points later, when typing; no need to re-read these portions |
| When enjoying the writing process | Speed and ease of transcription are greater; the task-time passes quickly; text comes out quickly – almost stream of consciousness; attention is not focused on diction; the process has momentum – and is sort of magical |
| When having writer's block | To scroll through documents easily |
| **4. Perpetuate efficiency** | |
| After finishing a draft | To spell check, read for typos, and fix paragraph breaks; to cut sentences and paragraphs that don't fit |
| When not able to part with text | Sentimental; likes writing on the sentence level |

| | |
|---|---|
| When revising autonomously on screen | Uses tracked changes; less impetus on sentence level: typeface has different (greater) sense of authority |
| When sharing drafts and receiving comments to/from her mom, friends, teachers | Easier to email; tracked changes and typed comments are clear; now apply to entire portfolio of writing and, thus, the accessibility of the digital format is helpful |

Amy does 'procrastinate a lot before beginning (Facebook, Instagram, texting, online shopping, etc.)'. When 'writing for a long stretch', she will break to check her 'phone or check Facebook every hour or so' and then 'promptly close the tab' before returning to work. When Amy sits down to write, she prefers 'to do it in one go'. A 'big impediment' to Amy's 'writing is feeling self-conscious so being around people is very hard'. Consequently, she writes on her laptop 'in bed … [where] there's not even a thread of interruption. It's total control.' Once she starts, she rarely has trouble focusing and does not 'leave any other applications or documents open – It does go quickly' when she is enjoying the process. As Amy likes 'to dedicate as large a block of time as possible to a single project', she often gets 'to a main point later in the essay than desirable' as she 'had to work through the writing to get there'. Amy likes 'to get things out on the page', which is helped 'by having something worked out internally'. Yet, 'if nothing is coming', Amy tries 'not to force' herself. Amy's ability to focus 'definitely' has evolved over the years and she 'can focus a lot better these days … working for longer periods on one piece'. However, increasing 'commitments … make it harder to block out time even when the focus is there'. Amy perceives herself as 'a super disorganized person' and insists that she 'does need to block out time to work … a chunk of time or else the writing won't get anywhere'.

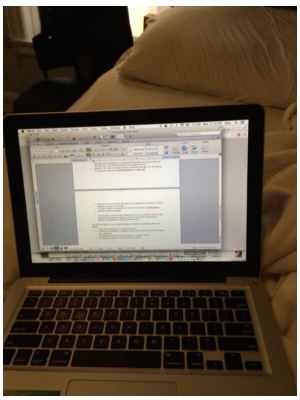


**Image 4: Amy finishing an essay for class in bed at 11.45pm.**

All of Amy's 'serious' projects eventually 'find their way onto a digital surface'. Maintaining 'that digital writing implements and surfaces are easier as mediums – and since any serious work will have to become a virtual document at some point', Amy finds it 'simpler to just engage with those implements right off the bat'. Thus, her 'work is in one easily accessible place, from which it can be edited, copy and pasted, blogged, emailed, etc. In this way technology isn't just a convenience, it's a necessary one.' Further, this allows Amy to think

about and access her 'entire portfolio of work every time with the beginning of each new piece – where that piece will fit into previous work in terms of themes, sound, craft, and technique'. Often, Amy will 're-read fiction and edit fiction … and read for ideas'. If 'looking for something specific', Amy 'will search a specific document'. When Amy has writer's block, she will 'just scroll through Word documents, trying to latch onto an old passion, voice, or image and work from there'. She will always find something she 'didn't remember writing'. Amy also always types 'the prompt' for her essays at the top of the document … because it's sort of intimidating to just go from a blank document'. She adds: 'I think it's more in the back of my mind – so just to get started, but at the top.'

Amy 'definitely think[s] that writing on a computer is sort of magical'. While her experiences of flow and the perceived benefits of undivided attention and total control illustrate the implications of the magic, she also tries to explain explicitly what she means by the characterization: 'with a word processor, you are just going – no word has, I mean it does in your mind of course, but no word really has a relationship to the words that came before it in the same way that it does when you are writing – it's like muscle memory … or momentum … it's that weird thing where you see your hands typing but you don't necessarily know where you're going'. She adds: 'I write so much faster on my computer. I get more down. It's easier and goes and I don't know what that is.'

Amy understands language to operate 'both on a level of actual significance and then also rhythmic patterns'. Throughout the data collection process, she continually referred to the idea of 'tension and release'. For her, tension and release refer to the 'very distinctive flow … of an argument, where you are hitting up against something and retreating and coming back to it and settling. That's the work of the writer in developing the underlying structure.' Amy attributes her understanding of tension and release to 'just reading … You just feel if something is right as opposed to not'. When writing the 'uphill' portion of 'tension and release', Amy's flow is slower, with frequent pauses and 're-reading sentences before starting the next one, working very hard to lay crucial groundwork'. Amy adds: 'I understand what I need to say in order to be able to truly write my hardest. That comes on the release … the crux of the argument, or the moment I have been writing towards. This usually comes out quickly, almost stream of consciousness, and I often don't have to re-read anything before continuing on, or scroll up to see how a paragraph should relate or can transition to the next.' Once done, Amy does 'read through to see

if the tension and release relate in the way they ought to – this often involves tweaking the "tension" so that the "release" feels truly interwoven and earned'.

Amy sees language as 'definitely influenced by technology and tech-references because it's obviously a huge part of the way we live now'. She explains: 'For one, there's the impact of … an entire new lexicon. For me, any work that's trying to tackle daily lived-experience is now unrealistic if it doesn't contain allusions to or the language of technology.' Amy noted that 'relationships now exists online or in text, Facebook message, whatever'. She has 'had a lot of conversations with people about how to put that on the page' but continues to find that 'you don't want to look at an IM in a serious piece of fiction. It feels wrong. It doesn't feel beautiful and artistic.' Yet Amy wonders whether writers 'are lying to their readers by not' incorporating electronic communications: 'More and more, it wouldn't make sense going from scene to scene if someone weren't texting someone else.' Technology also sources visuals that influence the substance of Amy's writing: 'a lot of what I write is influenced by visual images that are not just visual images. It's old movies, weird cartoons, commercials, music.' Furthermore, Amy thinks 'our relationship to language, and more specifically to writing is heavily influenced by technology. New media – like Twitter, Facebook, and Tumblr – are changing how people write, how often they write, who is read or heard, what audiences writers are catering to and have access to … Considering the fact that the answers to so many of these questions were essentially sealed for so long, and are now more or less in constant flux, the impact of technology is undeniable and inestimable.'

When Amy finishes her writing, she will 'spell-check, read for typos, and fix paragraph breaks'. She 'also will cut a lot – sentences or paragraphs that just don't feel right anymore'. Amy intuitively will 'know that a sentence or section just isn't fitting with the vibe of a piece', but will 'still save it somewhere else' because she appreciates 'the writing on a sentence level'. She adds: 'That being said, while I can't bear to part with some of these excerpts, I think that urge is sentimental more than anything else – I rarely find myself able to fit those bits into any larger piece – inserting excerpts into larger works usually feels forced and ill-fitting.'

When Amy began writing seriously, her editing 'was more about the sentence level and doing pretty things'. Now, she is 'trying to do bigger things on a structural level … like an emotional arc'. She does not edit when 'first producing something'. She does, however, 'go back to revisit old projects and often edits those drastically … usually with notes from a teacher or

peer'. Amy then will go 'through the same process again – holding the critiques inside, living with them, then generating new ideas, questions, structures, material to add to the piece or rearrange it by'. Asked to elaborate on the experience of living with her critiques before returning to the screen, Amy shares this: 'it's about learning to remove yourself from a work and see it from a different angle'. When Amy writes, 'it is the peak, and maybe even beyond that' of her 'capabilities'. 'When someone is giving' her a critique, she often does 'not have the ability or the craft to actually take in that critique and work with it'. She elaborates: 'I already did what I thought was the best I could do within the framework I had given myself, but clearly it's never the best it could be'. In taking time and distancing herself from the screen, Amy reaches 'a place' where she becomes 'ready to go back and to see the work in a new way'. 'I am not the person I was when I wrote it', she explains. Since starting college, she has become 'more adapted' to living with critiques, yet now she is 'more invested'.

Amy used to send her 'mom something to edit that would be for an assignment'. Now she has become 'more mature about' revisions, the process is more akin to a 'conversation' and the 'notes can apply to everything'. Amy still, however, might 'send something to an old teacher or a friend and get the track changes, which are important and … super helpful'. Also, 'in many workshops the teacher and peers will also type out around a page's worth of comments on each piece … For some academic classes, teachers take a similar route and type out critiques.' Even so, as was discussed, Amy finds that 'word processing is harder for editing … especially on a sentence level'. She finds that 'there is less of an impetus' and 'it's more about the body of the work and it is a different editing experience'. Amy discussed how the editorial experience and expectations of a digitized text – of writing in typescript – are less granular and more distant: 'once you get to the end … you often just find, "ok it goes where it needs to go"'. She adds: 'You don't have the same laser-vision … when you see something on a screen, it just has a greater sense of authority … a word processor is telling you to leave the text alone.' Towards the end of the data collection process, Amy commented that she was not sure what the writing process might be like without technology as she 'always had e-mail since being more of a sentient being'. She commented that there would be 'just so many levels that would be so difficult – even just writing and printing'.

## 6.2 Matt

**Table 6.5. Overview of Matt's uses of surfaces and implements**

| |
|---|
| ***When and why does Matt use non-digital writing implements and surfaces?*** |
| 1. Efficiently and precisely materialize ideation |
| 2. Pace and clarify thinking |
| 3. Filter and scaffold internal crafting |
| 4. Mark drafts during readings aloud |
| ***When and why does Matt use digital writing implements and surfaces?*** |
| 1. Manage online communications and information |
| 2. Translate and modify text efficiently |
| 3. Facilitate rapid and recursive macro ideation |
| 4. Validate ideas and arguments |
| ***How Matt's uses of surfaces and implements support his writerly ways of thinking:*** |
| 1. Liberate writerly activity |
| 2. Regulate internal crafting |
| 3. Materialize ideation for modification |
| 4. Perpetuate and enable evolution of substance and style |

Each morning, Matt will 'skim through emails' on his iPhone and 'will delete the irrelevant ones, and … then will flag the ones that need a response'. For Matt, typing emails on a cell phone is slow, 'hard to format … and the lost efficiency' makes him 'want to type concisely'. He often will 'just wait – unless it's urgent – to respond on a computer'. He then will 'open the computer and read thirty minutes of Mandarin Chinese' and then the *Wall Street Journal*. Though Matt was raised bilingual, he spoke English '25% of the time and Mandarin, 75% of the time'. Consequently he does not 'get that much intuition out of the English words themselves'. Matt is 'pretty convinced' that he 'might have minor ADHD' because he likes 'thinking about multiple things at the same time' but noted that 'Asia does not believe ADHD … exists'.

According to the English Department where Matt attended high school, 'learning how to write involved learning how to speak clearly and concisely'. Matt recalls his 'high school teacher's guidance' every time he wants to make a point: 'my freshman year English teacher – his voice – is in my ear when I try to say something or I want to pose a significant question'. Since high school, however, Matt has struggled 'to write in a clear and concise manner … especially when trying to elaborate more complicated ideas'. He often will 'try to sound sophisticated and it does not work'. He attributes those challenges to his first language: 'in Mandarin, you want to use the most complicated idioms possible to prove that you are intelligent'. Matt 'had to memorize roughly 5000 idioms'. By contrast, he finds that English is

'all about being clear and concise'. Matt now thinks he has a good idea of what constitutes a strong college essay, 'but due to the nature of the different subjects, one must really communicate with the professor'.

The following two sections will reveal how Matt's uses of non-digital and digital surfaces and implements, as outlined in Table 6.5, support his writerly ways of thinking by:

1. liberating his writerly activity;
2. regulating his internal crafting;
3. materializing ideation for modification;
4. perpetuating and enabling the evolution of the substance and style of his writing.

### 6.2.1 Non-digital Uses of Surfaces and Implements

As outlined in Table 6.6, Matt mainly uses non-digital surfaces and implements for efficiently and precisely materializing ideation; pacing, and clarifying his thinking; filtering and scaffolding his internal crafting; and marking drafts during while reading them aloud.

**Table 6.6. When and why Matt's uses non-digital surfaces and implements**

| ***Non-digital surfaces and implements***<br>Pens, pencils, note-books, and Post-its | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Efficiently and precisely materialize ideation** | |
| When brainstorming by hand on paper | More convenient; some thoughts require greater flexibility in form |
| **2. Pace and clarify thinking** | |
| When making short outlines on sticky notes | Gathers thoughts with structure but not too much rigidity; better for to-do lists; easy to stick next to his screen; reduces the major surgery of complete drafts |
| When crafting an argument into different sub-paragraphs | Pace of thoughts exceeds speed of handwriting, allowing for continuous sentence by sentence crafting as motor activity continuous |
| **3. Filter and scaffold internal crafting** | |
| When transcribing and thinking through an entire sentence in advance of transcription | Writing by hand is so slow, resulting in greater clarity and conciseness; word choice is more effective |
| After consciously identifying the audience when marking up a draft | Need to adjust mentality so drafts are read and refined appropriately |
| **4. Mark drafts during readings aloud** | |
| When marking a draft, while reading it out loud | Easier to mark spontaneously (including, spontaneous decisions about how to mark); greater spatial and gestural flexibility |

Matt will write notes by hand while reading materials for his papers. When 'the article is going to be very critical', Matt 'will print … and draw on it'. He prints what he will 'really need to read well … because there is a really big difference between skimming a paper, or reading the abstract or reading the topic sentences and really delving into the sources, references, and endnotes'. For final in-class essays – written by hand – Matt recalls that his teachers noted that he 'didn't use the fancy words – it was very clear and concise'. He reasons that because his handwriting is so slow, he will 'think through the entire sentence before writing'. Consequently, Matt often finishes crafting a sentence internally in advance of its complete physical transcription and then moves onto the next sentence while still writing the previous one. In line with these observations, Matt explicitly prefers to use 'non-digital writing implements and surfaces in two cases'. He prefers to use non-digital implements when 'when it is more convenient to complete the assignment in a non-digital format' and, as will be discussed below, for structuring his thoughts through written outlines. With regard to the former scenario, one example is 'a writing assignment that has many mathematical equations'. Here, Matt 'would prefer to write on paper … as it is difficult to draw diagrams on the computer'.

For Matt, 'the ability to think structurally … to propose a solution and then support it … [is] to some degree, how an essay works'. Though he is aware of different approaches to different types of academic writing (e.g. visual analysis papers), he often works to 'craft an argument and break it down into different sub-paragraphs'. He then will 'ask if the outline makes sense roughly an hour or so after its completion'. Matt prefers 'making short outlines and gathering thoughts using non-digital writing implements and surfaces'. As noted, he finds that 'when you write [by hand] … your writing is consistently trying to catch up with your brain. Your brain is actually outlining the paper in your mind as you just write it.' Recently, Matt started using sticky notes to guide his paper: 'I think it's a very good thing to have just a sticky note next to your screen telling you what you need to get done – it's like a to-do list.' This assists Matt in addressing a 'bad habit' from starting 'papers really early' where he will 'crank it all out' and then find that it 'is a piece of s***'. Without outlines, Matt always must do 'a lot of major surgery after the paper is drafted'. Matt, however, is 'still learning how to balance this because … going into a piece with a too rigid structure inhibits creativity and spontaneous thought'. Matt experiences this personally, noting that his brainstorming is 'situational … a little more ad hoc'.

Matt describes himself as ‘a person who verbalizes things a ton’. He will often talk to someone to ask whether his ‘approach makes sense … and the thesis could be valid’. These conversations occur in-person as Matt thinks ‘being asked questions on the spot and challenged is also critical to one’s learning’ and it ‘is usually easier for people to talk in person rather than having to respond to extensive chats or texts’. Though he will not always remember everything a friend might suggest, Matt will remember a ‘few things about these verbal feedbacks’, including the high-level assessment (e.g. ‘this argument sucks’) which will be ‘enough to move forward and follow up’.

To allow for ‘sufficient time to edit’, Matt starts papers early. He likes to edit ‘papers 2–3 times’ before submitting them because ‘editing is showing that you care. Editing is the effort.’ Matt’s drafts ‘sort of eat themselves up’. He thinks: ‘all the ideas of organization are very beneficial but, in execution, difficult to achieve’. Once his draft is typed, Matt will print it and then ‘always read the paper out loud to identify if any sentences can be improved’. He usually conducts these readings while ‘pacing’ and does not record them. He finds hearing his ‘own voice’ helpful as he has ‘been trained to *hear* mistakes’. Specifically, he is listening ‘for clarity … not for grammar’. As Matt reads, he will ‘pick up small syntactical mistakes’. However, his markings are ‘very spontaneous’: ‘Sometimes I use a red pencil … and usually I will write a big question mark and “Google” … My pen is all over when I read out loud.’ Often ‘after editing all the way and making these new sentences’, Matt realizes that the structure could be improved – this is ‘the surgery’ which does include ‘some grammatical changes’. Matt notes that the ‘only thing to keep in mind with the hearing thing is that … you need to identify your audience and usually when you are speaking, you assume the most basic – but … with writing, that’s a mentality to which one needs to adjust quickly before he can be confident of his idea’.

### 6.2.2 Digital Uses of Surfaces and Implements

Matt uses digital and bi-manual surfaces and implements in four key ways (see Table 6.7): to manage online communications and information, to translate and modify text efficiently, to facilitate rapid and recursive macro ideation, and to validate ideas and arguments.

**Table 6.7. When and why Matt uses digital and bi-manual surfaces and implements**

| ***Digital and bi-manual surfaces and implements*** iPhone and MacBook | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Manage online communications and information** | |
| Consuming information before starting writing | Priorities – curiosity needs to be satisfied to write |
| Leave other apps open when typing in a Word document | To receive mail and iMessage notifications |
| Shuts off notifications, turns on self-control or Focus View in MSWord | Needs to focus but remains troubled by the fact that no one can reach him |
| Turning on Airplane Mode all day | When work obligations necessitate neglecting social communications |
| When activating appropriate mentality and executing with clear discipline | Enhancing quality and efficiency requires conceptualizing and use of digital devices for singular functions, and ability to work amidst more distractions |
| **2. Validate ideas and arguments** | |
| Before and after taking breaks to hear his writing, and to get quick feedback from friends in person | Easier for people to talk in person; being asked questions and challenged in person is critical to learning – yet his digital devices enable easy texting to coordinate, if necessary, and then rapid transcription of outcome and takeaways |
| When researching before and while writing | Listing links in MSWord make the sources accessible; easy to bounce between his work and the internet, for reminders; substance of online materials informs Matt's writing and can subvert/replace ideas |
| As he researches online | Online content may replace intended points and his argument will change quite a bit, for simplicity, especially if an outline has yet to be drafted |
| **3. Translate and modify text efficiently** | |
| When typing a draft | Often has an idea of what he wants to sound like |
| To document everything, make edits, and share | Efficiency issue, prefers faster speed of typing |
| Uses MSWord or Google Drive | He does not need anything fancy |
| Saving materials constantly | Really bad habit |
| **4. Facilitate rapid and recursive macro ideation** | |
| When inserting sentences and creating while typing, the transcribing disturbs his train of thought | Speed of typing outpaces thoughts, leaves thoughts wandering, creates pauses as the thoughts will not have caught up with or have anticipated what's next |
| When working against personal deadlines set to make progress on an assignment, and trying to manage time | Time is the biggest challenge; he is a goal-oriented person and typing is fastest; benefit from adrenaline, staying ahead of schedule and creating time for revision |
| Uses MSWord footnotes and endnotes | To cite and reference materials |
| Uses Apple Thesaurus at all times | Typing speed always leaves time for improvement – the first of which, for Matt, will be word choice: he aims to sound more sophisticated, and will use the thesaurus to improve a section, play with words, find an alternative for a repeated word |
| When revisiting research and ideas to refine his thesis | Easier to see and have developed a lens through which to cut extraneous research to refine and simplify his argument/thesis |

For Matt, 'time is the biggest challenge to writing'. Though he will have 'a vision' of where his 'writing should be', he wonders whether, owing to limited time, he ever conveys 'ideas clearly and in a sophisticated manner'. He notes how 'published papers have gone through … drafts and peer reviews' but he does not 'have the time for that'. He also finds it 'frustrating' because he has 'the brain capacity' but with 'everything going on', he 'just does not have the time'. Even still, Matt continues to take breaks while writing, illustrating how time from the text may still be productive for the process. In one instance, Matt may 'need feedback from someone immediately'. He also may 'need to hear … how the writing sounds … [and will] go outside of Butler[30] and pace and have a cigarette', noting that the cigarette may be as helpful as hearing his writing. Regardless, he returns to his desk in Butler able to write his next section or paragraph. Introducing a third scenario, Matt initially characterizes it as 'pure procrastination', though his elaboration suggests otherwise. After setting personal deadlines, Matt will purposefully waste time so that he has less time to write because 'time pressure helps', but note that he is 'still working two weeks ahead of schedule'. Matt has been giving himself personal deadlines since high school. As 'a goal-oriented person', he feels good when ahead of schedule and 'setting deadlines before actual deadlines allows for a ton of revision'.

Despite such challenges with time, when Matt gets to Butler, he 'can't immediately sit down and start doing work'. Instead, Matt 'will prioritize consuming information over starting work'. He will start writing 'once that is momentarily satisfied'. When Matt is typing in a Word document, he will continue to have other applications open. For him, 'Mail is usually the annoying one.' He receives 'about 20–40 emails every day that require responses and another 10' he wishes he could handle. When Matt is writing a paper that requires focusing, he will 'shut both iMessage and Mail off … and turn on SelfControl': a productivity app that 'blacklist[s] websites … so his browser just can't access them'. Matt's SelfControl blocks him from Facebook and 'typical news sites'. Though Matt tries to 'use Focus View [in Microsoft Word] … there is usually a lot going on everyday'. Even when in Focus

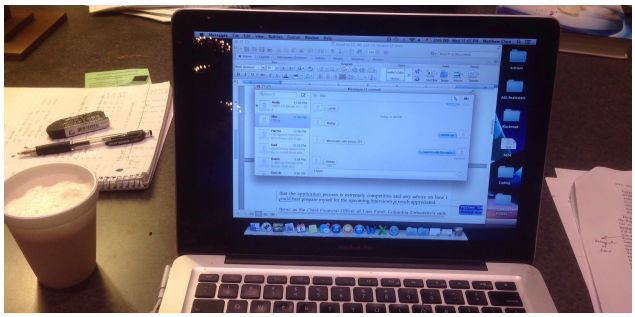


**Image 5: Matt sending an iMessage to his girlfriend, while drafting an email in a Word Document (in the window behind his iMessages).**

[30] Butler Library is Columbia's largest library.

View, Matt is ‘wondering, “Oh no one can reach me.”’ He finds ‘that itself is annoying’ but still will go ‘on airplane mode all day and just not care’.

Matt finds that ‘computers allow us to type so much faster … and to some extent it disturbs your train of thought’. He explains how ‘on the computer, you type so fast that when you finish a sentence, you are like, “Cool, I’m done so what next?”’ Though Matt is ‘a perfectionist’, he does ‘type really loudly and quickly’ and will ‘consciously try to make sure not to make mistakes’. Nonetheless, Matt prefers using digital writing implements and surfaces for writing. He believes ‘that it is easier to document everything, make edits, and even share’. For transcribing, Matt uses ‘usually Word … sometimes Google Drive but nothing crazy’. Matt saves materials ‘constantly’, which he describes as ‘a really bad habit’ that he developed while interning at Deloitte.

Matt prefers typing, primarily because of the speed, though the quality of his writing by hand receives more praise. For Matt, this represents an ‘efficiency issue’. However, he is determined to learn to make his ‘digital writing process of a higher quality … especially for the work place’. Matt finds that writing at a computer requires a different skill set and he has not ‘mastered it personally’. He suggests that skill set might entail ‘being comfortable working in an environment with more distractions’. Upon further reflection, he adds: ‘the real skill set is this mentality of “I am using my computer as a typewriter right now, thus it will be typewriter”, or ‘I am using my computer as a library now, thus it will be a library.’ Matt concludes that ‘efficiency per hour is the highest’ when clear discipline is executed.

Matt ‘keep[s his research] in a Word file with all the links … because it’s so accessible’. He uses the Microsoft Word tools for inserting footnotes and endnotes – the former to fill his ‘readers in, and then endnote is just like a citation’. Matt tends ‘to do a good amount of research before writing … usually online’ and to be ‘writing and doing research at the same time’. If he has not written an outline, Matt will keep ‘on bouncing here between the work and internet explorer’ as he will forget his specific points. He is conscious, however, that the jumping is not always beneficial: ‘I think it cuts the flow … which is a big issue for me.’ If Matt does not hear

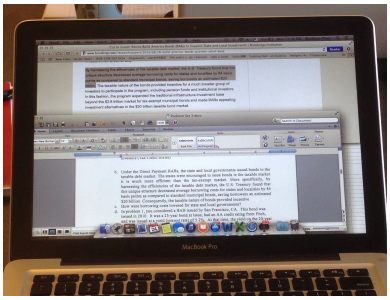


**Image 6: Matt working on a problem set with research behind, in Internet Explorer.**

himself ‘and the flow is not coming out’, then he will think not all of his ‘brain capacity has been dedicated to the task’.

Not only does the substance of online resources inform Matt’s paper, but their content can subvert or replace his intended argument. When ‘looking up so many secondary sources online’, points he ‘originally wanted to convey’ may get ‘replaced by content online, for simplicity reasons’. He elaborates: ‘I am all about thinking about the overarching theme, so losing the train of thought, you forget what your original paper structure was and what you are looking at, so you make unconscious decisions to go against that.’ Consequently, his argument does change quite a bit as he researches. Matt accepts this ‘especially because as you research … a lot of the essence of research papers comes from the research’. Matt maintains that a thesis ‘can be very simple’. As he is ‘so good at coming up with umbrella ideas’, Matt’s theses always are initially ‘very complicated’. For him, ‘the constant revisiting of research and developing an idea also allows for refining and hopefully, further simplifying the actual thesis’. After Matt has ‘refined the thesis’, he will ‘revisit all this research to get rid of deadweight and to add transition sentences’.

Matt thinks that using a computer influences his word choice. He recalls being ‘criticized … for always trying to use fancy words’, noting that ‘part of it is a mentality’. He offers another explanation: ‘technology is so available that when I think of a sentence, I can quickly manifest it on the paper within ten seconds but then have this blank because everything happened so fast and I’ll just think I could make that part better by looking on a thesaurus’. He adds: ‘if I consciously noticed I had used the word “ambiguous” every single time in the past few paragraphs, I would go on thesaurus and play with words, whereas if I am writing by hand, I’m like whatever … when I am lazy, I will use Apple’s thesaurus … sometimes you just want a more sophisticated way to say “at the same” time, and I will be like, “oh I like ‘in the same vein’”. That sounds cool and works.’

## 6.3 Emily

**Table 6.8. Overview of Emily’s uses of surfaces and implements**

| ***When and why does Emily use non-digital writing implements and surfaces?*** |
|---|
| 1. Simplify surface interaction for note-taking, ideation, and planning |
| 2. Progress planning through tangibility |
| 3. Personalize source material when reading and researching |
| 4. Generate and evaluate an argument’s substance, structure, and cohesion |

***When and why does Emily use digital writing implements and surfaces?***

1. Extract and clean handwritten planning
2. Expand surface space, and organize and read resources on an iPad
3. Accommodate time pressures and needs
4. Facilitate communication

***How Emily's uses of surfaces and implements support her writerly ways of thinking:***

1. Reduce task load
2. Render gestation tangible and stable
3. Expand and organize the visible workspace
4. Facilitate paper evolution and collaborative editing

In her 'kindergarten and first grade classes', Emily remembers 'getting pads of writing paper that had extremely thick lines'. Her first foray into essay writing involved learning the five-paragraph structure: introduction, three body paragraphs, and conclusion. Now, a college junior, Emily finds that her professors 'are looking for a thesis statement, for you to go through the points and to use the text as evidence … and for you to have … done some real critical thinking and discovered some bigger questions so … there is a lot of room for flexibility while it follows that form'.

Emily writes in bed 'a lot actually – sitting up – propped up with a lap desk and everything' but writes 'notes there less often because it gets messy'. She always writes with 'white noise' and is not able to 'write in silence – at least for the last three years'. While she always writes with music, if it does become distracting, she 'just pauses the music'. When 'doing an outline', she listens 'to music less because that's when … most of the real, real thinking is going on'. Emily writes roughly 500 words in one sitting, though that word count seems to be decreasing; writing makes Emily very tired. When asked what the fatigue while writing is caused by, she responds: 'I love the finished product and think it's very satisfying but I just don't enjoy the process. I don't enjoy writing. I just want to be done.'

The following two sections will expand on Table 6.8 to reveal how Emily's uses of non-digital and digital surfaces and implements support her writerly ways of thinking by:

1. reducing task load;
2. rendering her gestation tangible and stable;
3. expanding and organizing her visible workspace;
4. facilitating her paper evolution and collaborative editing.

### 6.3.1 Non-digital Uses of Surfaces and Implements

As outlined in further detail in Table 6.9, Emily primarily uses non-digital surfaces and implements to simplify surface interaction for note-taking, ideation, and planning; to progress planning through a desire for tangibility; to personalize source material when reading and researching; and to generate and evaluate an argument's substance, structure, and cohesion.

**Table 6.9. When and why Emily uses non-digital surfaces and implements**

| ***Non-digital surfaces and implements***<br>Pens and legal pads or loose-leaf paper | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Simplify surface interaction for note-taking, ideation, and planning** | |
| When taking notes by hand | Does not like to switch between applications on her screen; too difficult in digital formats/apps: time-consuming, harder to push the buttons on an iPad |
| **2. Progress planning through tangibility** | |
| When brainstorming and outlining | For tangibility that is incredibly satisfying: seeing and feeling the progression through pages, crossing out handwritten text and then discarding physical pages |
| When thinking, organizing thoughts and outlining after she picks a side to argue | Writes lists of evidence on legal pads; making these by hand is helpful – as are the spatial decisions, feedback, and ability to cross out items by hand (the digital strike-through does not have the same effect); internalizes choices being made |
| **3. Personalize source material when reading and researching** | |
| While reviewing books and journals for collecting quotations and organizing papers | Always takes notes by hand and writes significant quotations down on a legal pad |
| Before being able to compile notes onto one sheet | By going through 20 pages of paper using only pen, Emily continually refines her ideas into a cohesive outline |
| **4. Generate and evaluate an argument's substance, structure, and cohesion** | |
| When developing topic sentences by reviewing her argument's logic | Refines crucial points into potential topic sentences, which underpin her process; takes time to choose the right words and express the right ideas; seems more permanent |
| When reviewing lingering questions and gaps in the argument | Will discuss her handwritten outline with friends to improve the clarity of her argument, and to address assumptions |

Emily has never been 'a last minute writer'. Even short papers require 'multiple days of thinking, days of organizing, days of writing, and days of editing'. She noted that her lengthy process may not be ideal when she has 'a lot of papers to write in a short amount of time', and admits that she still struggles 'to write detailed outlines before beginning the writing process and to write concisely'. Though Emily would prefer 'at least a week' for an essay, 'in a lot of cases, that's just impossible'. Consequently, she continually will 'not spend enough time outlining

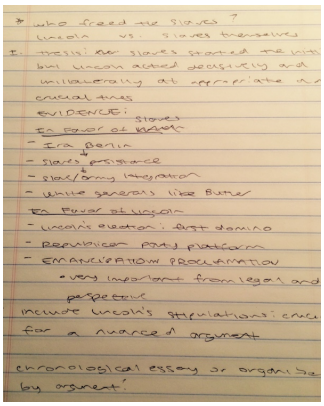



**Image 7: Emily's notes written in pen.**

because' she will 'just want to get writing'. Reminding herself of the utility of outlines has been helpful. Emily's days of thinking begin by asking 'a question about the text or topic in question'. After, she picks 'a side to argue' and, based on that, she 'make a list of the evidence that will support the thesis', adding that it 'helps to write down 1, 2, 3, 4'. Emily then reviews 'the books, journals, etc.' from the course and writes 'significant quotations'. When she begins 'to collect quotations and organize the paper', she writes her 'thoughts on a legal pad … trying to hone down the ideas into a cohesive outline'. She often goes 'through 20 pieces of paper before being able to compile all of the notes onto one sheet … and will only use pen'.

Embarking on the outline, Emily will commence with the steps necessary 'to prove to the reader' that she is 'right'. Crucial points become topic sentences and after reviewing those points, she will ask herself, 'What lingering questions would the person I am explaining this to have?' If Emily 'can answer those questions with evidence', then she will; questions that have not been 'addressed in the sources … form the conclusion'. Once her outline is 'formalized', Emily will 'type it out in a (Word) document next to the paper 'because it is 'easier to read and understand that way'.

What Emily now struggles 'with even more than' time, is clarity: 'the steps' that she thinks are necessary 'to explain … to a reader, make more sense internally' and she has 'trouble articulating them and then it's hard – without an outside perspective – to see how it might be confusing'. One way in which Emily addresses this is by always writing her topic sentences by hand: 'the most crucial part of my paper-writing process is the outline and, specifically, my topic sentences. By handwriting my topic sentences out I find myself taking the appropriate time to choose the right words and express the appropriate ideas.' When Emily takes 'time to write specific portions by hand', they feel 'more permanent' and, thus, she will 'think harder about words because' she does 'not want to have to write them again'.

Another reason that she brainstorms and outlines on paper is for the 'sense of tangibility … There is something incredibly satisfying in physically seeing a paper progress through throwing out pages of subsequent outlines.' She likes 'to physically write things down on a pad of paper 'for 'the feeling of crossing things out and throwing pieces of paper away and creating

the spacing‘ on handwritten outlines’. She also reasons: ‘I internalize the choices I am making when I do it that way’.

### 6.3.2 Digital Uses of Surfaces and Implements

Emily uses digital surfaces and implements to extract and clean handwritten and typed planning; to expand surface space, and organize and read resources on her iPad; to accommodate time pressures and needs; and to facilitate communication; details of such instances are provided in Table 6.10.

**Table 6.10. When and why Emily uses digital and bi-manual surfaces and implements**

| ***Digital and bi-manual surfaces and implements*** iPhone, iPad, and MacBook Air | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Extract and clean handwritten and typed planning** | |
| Types her outline after formalizing and finalizing it | Easier to understand when typed |
| When transcribing drafts on her laptop | Enjoys typing more: tactile response, impermanence of text; easier to transcribe as much as possible (which her high school teacher advised her endlessly to do first) |
| When ‘slimming’ down drafts | Draft already digital; easier to contextualize paragraph; process symbolizes progress, even if more difficult than the transcription |
| Before needing to ‘talk through’ challenging sections | When she hits road blocks while typing, verbalizing helps her work through and review those challenges |
| When she is frustrated or hits a road black | Deleting big chunks is very satisfying |
| **2. Expand surface space, and organize and read resources on an iPad** | |
| When trying to compose and process content on her screen, from multiple documents | Crowded screen renders electronic resources difficult to process and composing difficult to execute |
| Props up iPad when she needs multiple documents in her viewpoint | She initially used this set-up to address screen constraints, but has found being able continually to retrieve her outline reinforces its internalization |
| Using her iPad for an app called Remarks | Facilitates the organization (for storage, retrieval, and accessibility) and annotation of all digital texts, while proving more difficult for note-taking on materials; started taking notes directly on Remarks while in Australia owing to the lack of paper but will return to writing notes by hand |
| Reading on her iPad | Prefers the visual of the text (in comparison to her computer and laptop) and the ability to position the iPad |
| **3. Accommodate time pressures and needs** | |
| When conducting research online across devices | Maintains online research enriches her work; however, owing to time pressures, she stops researching too soon and makes generalizations. |
| When conducting research online across devices | She does not find the scope of material available overwhelming because she has yet to learn how to use the internet well to find sources. This is not a priority for her, at |

| | |
|---|---|
| | present, as it is not instructed and so, not expected to do this. |
| After spending a day from the draft, she will edit on screen. | Allows her papers to evolve, which encourages longer engagements and much more editing. She makes a full range of edits (changes to diction, syntax, style, and structure) and reviews each paragraph individually and for cohesion between paragraphs. |
| **4. Facilitate communication** | |
| While typing, she verbalizes her way through road blocks | Word processing facilitates the quick transcription of solutions and recursive modifications, as necessary |
| Texts throughout the writing process | Started texting through iMessage on her computer, because it felt 'better' than texting on her phone |

Emily does 'enjoy typing more' because the writing does not 'feel permanent'. She also finds that 'being able to delete big chunks of writing is very satisfying', especially when 'frustrated or hitting a road block'. When writing her papers, Emily first will transcribe 'as much as possible down on the page'. This approach began in high school, where Emily was 'told a million times by her teacher to just get everything down and then to go back and refine'. Emily continues to find the initial execution easier – than refining. In addition to the ease of typing, 'viewing a paper on a computer screen makes it easier to see each paragraph's role in the larger context of the paper'. She does 'not get this same sense when viewing a hard copy'.

As noted, Emily tends to 'use longhand for note-taking'. One reason for this is that it is 'hard to look at electronic sources and take notes simultaneously. Things get too busy on the screen.' Emily keeps her assignments 'all saved' on her computer or iPad, and finds it difficult to look 'fully at an assignment and have another Word document open and look at a text at the same time in terms of the typing on my computer'. Thus, she will 'have a text open' and 'the assignment open and then the screen is basically full'. As Emily does not like 'to switch back and forth between' the documents, she will 'just take notes by hand'. She maintains that she 'should just get two computers' because she likes 'to have everything open simultaneously but only without having to click between the materials'. This explains why Emily finds her iPad really helpful: 'I can have my iPad propped up with the text and then I can have the assignment on my laptop.' Regarding disliking having to switch between materials, 'initially it was about the spatial constraints on the screen'. However, she has realized that 'having to go between and outline and an actual essay' forces her to look at the outline and 'the reminder is a beneficial side effect of the spatial constraint'.

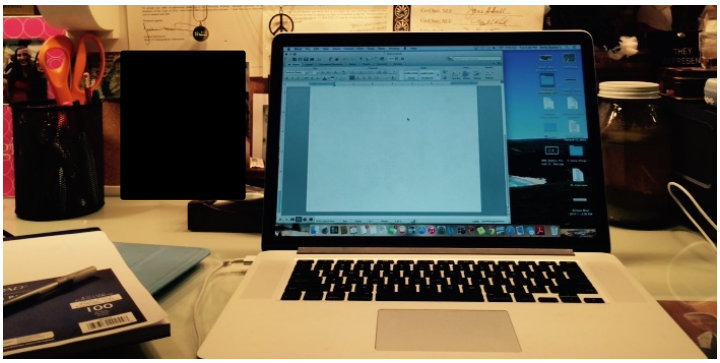


**Image 8: Emily's laptop at her desk in her room, before beginning to draft, with her notepad and iPad to the left.**

Emily also uses her iPad for an app called Remarks to organize and to annotate documents and PDFs. Comparing this to annotating by hand, she claims the only difference characterizing her markings in Remarks is that she does not 'write many notes just because it is more difficult to actually write in the document'. For each paper, Emily will 'make a folder on Remarks … to keep track of sources … [and does] feel like – as opposed to printing them out – they are much more organized and things don't get lost and she can look at them'. Emily, however, does not sync the PDFs on her iPad to her computer. She likes 'seeing electronic text on an iPad, as opposed to on a computer – or in print'. In Australia, Emily 'actually started taking notes directly on Remarks … mostly because there was no loose-leaf paper' She later noted: 'it will be more by hand when I return because I just find it too difficult to write on the iPad … it is so time consuming to type on that screen … It's harder to push the buttons.' Emily also prefers 'the physicality of pushing them down on the laptop'.

Emily is 'told by other people' that she mouths words that she is texting. Related to this, when 'hitting road blocks' with academic writing, she will 'speak out loud'; she will 'stop writing and talk' to herself and as she resumes writing, she will continue to 'speak out' the writing because 'it is easier to tell if it makes sense'. Emily also likes to hear her writing out loud once transcribed but 'would not want the computer to read it back'. She would 'rather read it out loud slowly'. When Emily hits roadblocks, 'it's the act of speaking' that is helpful. Although she 'can't pinpoint how this act is helpful;, Emily suspects simply being able to identify necessary modifications more easily when hearing a sentence out loud may be one reason.

For Emily, 'time pressure' prevents her from doing deeper research despite understanding the benefits. She admits she is not sure why this is, but explains that she 'sometimes gives up on researching too soon and will make generalizations before having a wide breadth of research'. She suspects 'that spending an extra day or even a few hours solely doing research' would make her 'writing process' and her 'thesis even stronger and easier'. She thinks access to content

online ‘enriches’ her papers though, generally, the ‘essays or research papers are only using texts from a list that the professor distributed’; ‘the research is within that realm so it is a bit narrowed down’. Emily is not confident in her ability to ‘use the internet to find sources’ and believes that Columbia has not taught her how to search online for material. She suspects for those who do know how, ‘it would be a bit overwhelming’.

Emily’s editing ‘is done on the screen’ even though she has heard that is ‘not the right way to edit really’. Nonetheless, she has found the computer to be ‘infinitely helpful in letting papers continually evolve’. She maintains ‘it would be difficult … to spend the appropriate amount of time revising … if the computer did not make this process as easy as it does’. In addition to allowing her to edit her ‘papers *soooo* much more’, using a computer facilitates making a range of edits, including changes to diction, syntax, style, and structure. After writing a draft of her paper, Emily will ‘put it down for a day and then go back and look at each paragraph individually and make sure that the points within the paragraph flow, but are also coherent’. She then reads the paper again and any ‘lingering questions … turn into the conclusion’. One of Emily’s ‘biggest pet peeves when editing a paper on a computer is using the strikethrough feature’. She explains: ‘I love crossing things out during my planning process but the feature on the computer just frustrates me because I still see the idea on the screen and I just want to delete it at that point’. Yet, when crossing out an item by hand on paper, ‘it feels truly removed’.

Emily always completes a few rounds of editing herself but finds it ‘to be a difficult process’. She often solicits her mother’s feedback. After emailing her papers to her mom, they discuss areas that were ‘particularly difficult’. During the discussions, they ‘actually will screen share because it’s easier not to have a miscommunication’ when they are discussing the same visual representation. They screen share via iMessage: ‘Click on the tab that says buddies and then scroll down to Share My Screen. It’s a really great feature.’ According to Emily, screen share ‘has changed things *completely*’. She often struggles to convey in her writing what she intends to say. Being ‘able to simultaneously have her mom read’ what she has written and then discuss the intended meaning assists her mom in ‘helping re-word and restructure’. The screen-share lets Emily ‘combine talking things out with an electronic exchange of comments … and to talk and type the changes while discussing’.

## 6.4 Zoe

**Table 6.11. Overview of Zoe's Uses of Surfaces and Implements**

| |
|---|
| ***When and why does Zoe use non-digital writing implements and surfaces?*** |
| 1. Minimize distractions while note-taking |
| 2. Process, possess, and retrieve reading |
| 3. Outline on small, moveable Post-its |
| 4. Access and elaborate upon own thoughts |
| ***When and why does Zoe use digital writing implements and surfaces?*** |
| 1. Activate determined sense of purpose |
| 2. Satisfy visual needs |
| 3. Execute in one sitting |
| 4. Facilitate autonomous revising (e.g. with text-to-speech and digital tools) |
| ***How Zoe's uses of surfaces and implements support her writerly ways of thinking:*** |
| 1. Reinforce and refine internalization (reading and crafting) |
| 2. Engender purpose through mental and physical associations |
| 3. Promote confidence through tool accuracy and reliability |
| 4. Enable temporal flexibility |

Zoe is 'definitely attached to her iPhone', using it for 'texting, emails, definitely a lot of emailing … safari, instagram, and facebook'. Though she does respond to emails on her phone, often she simply reads them and then will 'mark them as not read and then will go back to the computer if they're going to be a lengthy response or something to think about'. Recently, Zoe turned the new text prompter in the latest iPhone operating system upgrade 'right off' because it was 'weirding' her out and 'not guessing good things and distracting'. Zoe maintains 'that writing is definitely a craft that comes easily to some and not to others'. She does not think that she is 'a very strong writer', nor would she 'say writing comes easily' to her. She does attribute this partially to not learning 'grammar until eleventh grade'.

Zoe continues 'not to enjoy writing academically despite becoming better at it throughout college'. She believes that 'having to write and read academic papers so much' has been particularly influential, while 'general feedback from professors' and 'seeing what people like and don't like' also have been helpful. Zoe appreciates 'that academic writing is usually well planned out and often follows the same structure with a thesis at the beginning and supporting facts and research' rendering 'academic writing easy to follow and write'. She finds academic writing leaves 'nothing to mystery'. Zoe finds that she is 'able to write quickly and put the thoughts' in her 'head onto paper' – while taking 'the research and information gathered and weaving them into the writing appropriately'.

The following two sections will reveal how Zoe's uses of non-digital and digital surfaces and implements, as introduced in Table 6.11, support her writerly ways of thinking by:

1. reinforcing and refining her internalization while reading and crafting text;
2. engendering purpose through conceptual and physical associations;
3. promoting confidence through tool accuracy and reliability;
4. enabling temporal flexibility.

### 6.4.1 Non-digital Uses of Surfaces and Implements

As detailed further in Table 6.12, Zoe uses non-digital surfaces and implements to minimize distractions while note-taking; to process, possess and retrieve reading; to outline on small, moveable Post-its; and to access and elaborate upon her own thoughts.

**Table 6.12. When and why Zoe uses non-digital surfaces and implements**

| ***Non-digital surfaces and implements***<br>Pens, pencils, paper, and Post-its | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Minimize distractions while note-taking** | |
| When taking notes in class | She has a desktop and likes taking notes by hand; using her iPad would be too distracting |
| **2. Process, possess, and retrieve reading** | |
| When reading articles or course materials | She always prints them for better processing while reading, to take notes directly on the source; to underline important areas of the text, to write in the margins: to write thoughts and summarize paragraphs – as a check for comprehension and for retrieval |
| When returning to summaries of paragraphs | Helps to see in her own handwriting; summaries in the margins obviate having to read the entire paragraph |
| **3. Outline on small, moveable Post-its** | |
| When writing outlines on paper or Post-its before drafting | Faster to do by hand as she often changes her outlines. The process and organization improves her writing, and assists in developing an understanding of which information belongs in which paragraphs. The Post-its easily stick to the base of her desktop. |
| **4. Access and elaborate upon own thoughts** | |
| When expanding her outlines by hand | She gains more insight into her own thoughts about what she actually wants to say. |

Zoe does not like 'using pencils'. She will 'use non-digital writing implements and surfaces when reading any articles or course materials'. She prefers to write by 'hand for notes so that the notes are directly on the source' and so she is 'able to underline important areas of the

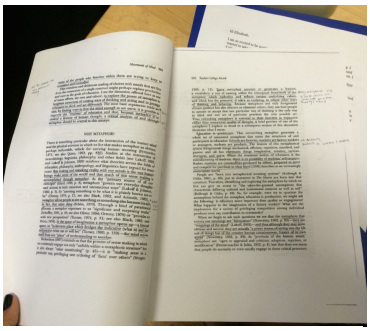


**Image 9: Zoe's "own notes and underlining" on reading for class, to help with her "understanding".**

text and write in the margins'. She handwrites all of her notes in class because she both has a desktop and likes taking her notes by hand. Later Zoe added that her 'iPad would be too distracting' and she would not keep her 'phone out in class'.

Zoe will 'always print readings if they are posted online' and tries 'rarely to read anything on the computer'. Zoe iterated that she is 'not a good reader' and has 'never been a great reader'. She is 'not fast and … just not strong'. For her, 'hearing the text is way better … than reading it'. On paper, Zoe 'can write thoughts down or … summarize paragraphs off to the side … as a check … to make sure' she understands the material. These practices have evolved because Zoe does not 'often remember so three pages later' she will wonder 'what did that mean and then it's there to see in' her 'own writing'. As a result, she does not 'have to re-read as much'.

To improve her writing, Zoe has tried using 'outlines more and more throughout college'. Her 'outlines are usually brief, taking a few minutes'. Before she begins writing, however, she will always 'try to have some outline or understanding of which information will be put in which paragraphs'. She outlines 'essays on Post-its or paper (not on a Word doc on the computer)' and will stick them to the base of her desktop. She handwrites these because she 'often will change' her 'outline a few times or will want to add things' – which is 'faster to do by hand'. Her 'outlines are minimal so one paragraph is going to be about this' and she might 'cite a quote in the outline, and then the second paragraph is going to be about this', which she then will 'expand upon'. Zoe adds: 'through the expansion, I gain more insight into my own brain about what I actually was saying. So re-reading the quote a couple of times makes me realize what was actually being said – and sitting and spending more time with the paper clarifies my thesis'.

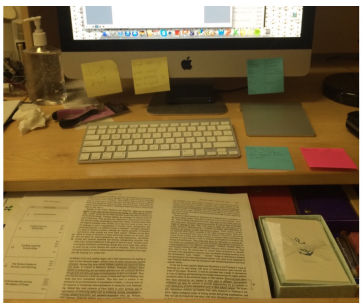


**Image 10: Zoe is working on a paper with her outline and thesis on her blue and pink post-its, and readings in the drawer.**

### 6.4.2 Digital Uses of Surfaces and Implements

Zoe's uses of digital and bi-manual surfaces and implements occur to activate a determined sense of purpose; to satisfy visual needs; to facilitate translation and construction of thoughts into

written text; and to enhance revision of text onscreen (e.g. with text-to-speech and digital tools); see Table 6.13 below.

**Table 6.13. When and why Zoe uses digital and bi-manual surfaces and implements**

| ***Digital and bi-manual surfaces and implements***<br>iPhone and iMac with a 21.5 inch screen | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Activate determined sense of purpose** | |
| When managing the time of the process | Forces herself to write in one sitting; getting off task results in more time being taken |
| Writing formal assignments at her desktop in her room | Desktop activates productivity: thinks more before typing; suppresses automatic language behaviour and communication habits. |
| **2. Satisfy visual needs** | |
| Her desktop has a 21.5 inch screen | Sees the entire page |
| When *needing* to focus | Rarely uses Focus View |
| When formatting: always types in Times New Roman, double spaced from the beginning; eventually adds page numbers and headers, and bold and italics | The writing and the process appears neater, allowing her to focus on the actual work and not the act of being neat |
| **3. Facilitates translation and construction of thoughts into written text** | |
| Does not do research online | Finds it very tedious to select and extract information from sources, so uses assigned/printed materials |
| Types her papers on her desktop keyboard | Typing is much faster. The keyboard's feel and layout have become familiar. Papers eventually must be typed. |
| Typing responsive papers is a more fluid transcription process. | It's just her thoughts and creative thinking – no retrieval of information, or associated thoughts |
| When typing a draft of a reference paper, the transcription is not always fluid. | She can usually focus in order to complete a paragraph, or when a thought is flowing; transitioning breaks her flow. Adding references stops the forward flow while drafting; finding and recalling what she wanted to say about a quote is disruptive |
| When typing a draft, the construction is not linear. | Copying and pasting facilitates the movement of text. Adds the majority of references when reviewing an initial draft so as not to stop her flow. Writes the introduction last as it and the thesis are the hardest parts. |
| **4. Enhance revision of text on screen (e.g. with text-to-speech and digital tools)** | |
| Frequently uses an online thesaurus and dictionary when translating her ideas into words, and reviewing their reception | Struggles with clarity and cohesion, often owing to her word choice and word order; uses the digital tools to check or refine her word choice, though finding the right word may be difficult. |
| When conducting autonomous revisions on screen | Likes to materialize her ideas before modifying them (so as not to forget the content); does not bother with correcting spelling or punctuation while typing drafts as she easily can change the digital draft; easy to read drafts multiple times on screen |
| In deciding to use, and continually using, text-to-voice on her computer to conduct autonomous revisions | Distrusts her own ability to read from the screen; confident in the accuracy of the text-to-voice feature; now has a shortcut for initiating text-to-voice |

| | |
|---|---|
| While listening to her computer to enhance her autonomous revisions | Text-to-voice allows her simultaneously to hear and to read the text. She pauses to make corrections; will go through a text three to four times, making extensive edits, from punctuation to whether words sound good together |

Zoe writes on a 21.5 inch MacBook desktop. A habit begun in high school, Zoe continues 'only to write in her room at her desk'. Her tendency to work best in her room was one reason for purchasing the desktop for college though she 'definitely' likes the keyboard for her desktop and has 'grown really used to it'. Laptop keyboards are 'a little different': 'a little wider and the keys feel a little different'. Though Zoe 'can move the desktop keyboard, 95% of the time', she will sit at her 'desk because there is something about sitting at that desk that is very "work time": It's serious.' Zoe is 'not the kind of person to go on Facebook then. The most distracting thing is email.' When she sits at her computer, her 'papers are either in front or off to the sides but … spread out'.

Zoe's desktop has a 21.5-inch screen ('it's big'). On her screen, she can 'see the entire page … and will do a full screen where it blacks out everything … when really trying to be serious … but that's rare'. More often, when writing in Microsoft Word, Zoe also will have her email application open: 'a really bad habit'. There is, however, 'a process to it': 'the emails are behind and tucked to the side.' This allows Zoe only to 'see the number – like inbox and the number – and the paper is in front of it – so' she 'can't actually see the emails coming in'. Zoe will 'check the number of unread emails before' she begins to write. She then will 'click into the email only if the number changes'. If 'a stressful email comes in', she loses control and the paper is 'never going to get done'. Zoe does not 'go more than ten minutes without checking' her email. Yet, when she does 'need to write a paper', she 'will sit down and do it' – though she never shuts her email down. Zoe has removed iMessage from her computer, as she 'knew it would become a huge distraction when writing papers'. The actual emails 'interrupt' her 'more so than multitasking'. While aware of the implications, Zoe 'just can't' close her email.

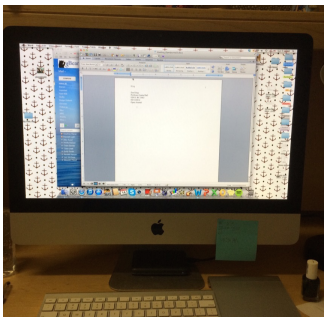


**Image 11: Zoe is writing a paper with "email still up in the background".**

For Zoe, texting, writing by hand, and typing at her desktop all entail different mind sets: 'Desktop is for formal and serious things. Handwriting is for quick notes/outlines.' Zoe

maintains that her use of language varies ‘more between text and email’. She tends ‘to be very formal in emails – and very not formal in texts’. Her email formalities developed in college, as she has been required to send more emails both as a student and through holding positions of authority in her sorority. Currently, she is head of risk management. Zoe noted: ‘there are certain things I say in emails that I would never say aloud’ but suggests that her ‘subconscious probably plays a bigger role via text’, when she is ‘not as focused and more likely to say what I actually think.‘ Zoe elaborates: ‘I text like I speak … my text messages … make sense because that’s exactly how I would say it aloud.’ She also commented that how she texts is similar to how she writes by hand in that ‘can write next to what [she] wrote’. By contrast, she is ‘definitely more thought out when typing on the desktop’, adding ‘I think before I actually type.’ Though remaining unsure why these differences existed, Zoe cited having ‘certain habits’ and that she will ‘probably suppress’ her subconscious when doing ‘more “serious” things’ on her desktop.

Zoe does ‘use the computer to type the actual assignment because ultimately this is how it will be given to the professor’. She finds that ‘electronic writing implements are neater’, which allows her ‘to focus on the actual work they are producing and not the physical act of neatly writing’. She always types ‘in Times New Roman double spaced when working on papers’, and ‘usually adds page numbers and headers … and bold and italics every now and then’ but otherwise does not really use formatting options.

According to Zoe, her ‘mind is definitely more scattered’. She will ‘never handwrite papers’ because she ‘obviously’ types ‘much faster’; when ‘an idea hits’, she ‘can instantly get it down, whereas if writing, it would be a slow lug to that point’. Zoe tries to write her essay ‘assignments straight through in one sitting, usually blocking out a few hours’ but will stay ‘as long as it takes’. She ‘can usually focus paragraph by paragraph’ and when ‘a thought gets going’, she is ‘good for a while but then transitioning’ will get her off. By ‘forcing’ herself ‘to write in one sitting’, Zoe knows that getting off task only means ‘more time’. She explained that she uses her ‘dislike of papers’ to her ‘advantage’.

When drafting, Zoe ‘always’ tries ‘to write the introduction first’. After realizing that she ‘can’t’, she then moves to ‘the body’. She will start ‘with [her] first main body paragraph and write the introduction last because this is the hardest paragraph to write (especially the thesis)’. Though Zoe tries to ‘add in as many references as possible when … writing it straight through’,

she will ‘often go back and add more … the second time through’ This allows Zoe not to stop her ‘forward flow of thinking to look up quotes but instead do that after everything is written’.

For Zoe, translating what she is ‘exactly trying to say into words concisely and “mature sounding” can be difficult’, as is ‘being clear and succinct while still being detailed enough to prove [her] thesis’. She notes: ‘I am not that great at expressing exactly what I think.’ This sharply contrasts with her assessments of the translation of her thinking while texting. When writing, what ‘makes sense’ to Zoe ‘can often be slightly unclear to the reader or not direct enough to prove a point’. Zoe often thinks she is saying what she wants ‘to be saying but it’s always a little grey and fuzzy’. She suspects this disconnection may be owing, in part, to ‘word choice … though often … to the word order and phrasing’. Accordingly, Zoe uses ‘an online thesaurus a lot … [and] an online dictionary’: ‘to make sure I am using the right words’. However, ‘finding the right words can be difficult’. Zoe specifically uses Thesaurus.com and was not aware of the built-in Microsoft thesaurus, though she does ‘use the dictionary in Word sometimes’.

Zoe does not do much research online. Rather, her references are ‘usually coming from printed articles or books next to’ her. She does ‘find it very tedious to collect all the necessary information and pick out which pieces of information will help support’ her thesis. Once selected, however, integrating the information within her ‘writing is usually easy’. This offers one explanation for why Zoe finds digital writing allows ‘for easier ability to move different parts of writing around electronically by simply copying and pasting’. Even so, she is disrupted when she has ‘to reference things’. Not only does she ‘need to find that quote’ but then she must recall what she wanted ‘to say about the quote and then it’s this back and forth, whereas responsive papers – it’s just’ her ‘thoughts … creating it all, versus having to take and pull and take and pull’. Zoe iterates that ‘it’s just the stopping and going that kills’ her.

Zoe edits autonomously when using her computer. She explains: ‘I just like to get my ideas onto paper and then go from there. So generally, it is more autonomous overall.’ Zoe edits by reading her complete drafts a few times, sometimes in different sittings. She makes the majority of revisions during the first review ‘and then goes through the piece a few more times to make sure it is perfect’. She tends to ‘edit a fair amount, often finding misspelled words and improper punctuation that had been disregarded when writing the paper straight through’. She adds: ‘I do not usually bother myself with correcting spelling or punctuation when I’m writing

the assignment the first time, so I can focus on the content and not forget my ideas.' Though she mentioned sometimes having friends read her papers, she conceded that she does not 'really like having people read them so it's sort of a weird thing'.

Instead of friends, the editing practices described above are supported by having the computer read Zoe's paper to her. Though she did not discuss this practice when initially asked about her editing, she has used the feature since freshman year – across formats. She explains: 'I do it three, maybe four times. I usually do it paragraph by paragraph. I do it for emails – because I'll miss a comma and then the sentence will be too confusing and then I put the comma in and I'm like a-ha!' When using this tool for editing her papers, she will 'just stop it from speaking – and make a correction right then and then keep going'. The first round of listening and making corrections 'takes a really long time because it's edits, edits, edits, edits … sometimes it's full sentences, sometimes commas'. The 'second time … there are some things. And usually by the third time or fourth time, it's fine'. Zoe has 'the computer read it' so she 'can hear the assignment out loud and make sure the punctuation is correct and the words sound good with one another'.

For Zoe, listening to the computer is 'like having someone else read it exactly how it is written – not how' she is 'thinking it's written'. She maintains that the computer voice is always accurate. Zoe recalls writing words that she does not mean and 'reading them wrong too'. For Zoe, 'it's definitely the act of hearing it'. She notes: 'I typed a whole email once and I kept on saying "bellow" instead of "below" for maybe three times … yeh, a little loopy. But then when the computer kept saying BELLOW back, I was like, "That's not what I mean!"' Zoe has the feature set so that when she inserts 'a keystroke for it … shift and the button next to the "1" … whatever is highlighted … it would start speaking.' She points out that as she listens to her computer, she is 'also reading it … so it's two processes.' Apart from text-to-voice and the dictionary, Zoe does not use other tools built into Word. Initially, however, she was not sure about this – and only by opening Word and checking was she able to confirm it. Besides writing papers for her, Zoe wishes that Microsoft Word offered 'more grammar help': 'sometimes it doesn't pick up that I have a word in a sentence that makes no sense. When I hear the paper aloud though, I realize.'

## 6.5 Uday

**Table 6.14. Overview of Uday's Uses of Surfaces and Implements**

| |
|---|
| ***When and why does Uday use non-digital writing implements and surfaces?*** |
| 1. Deepen reading intellectually and physically |
| 2. Support and anticipate ideation |
| 3. Materialize and guard ideas |
| 4. Filter creative brainstorming |
| ***When and why does Uday use digital writing implements and surfaces?*** |
| 1. Syntopical research and automated referencing |
| 2. Minimize abstraction |
| 3. Receive internal organization and production for fluid manipulation |
| 4. Facilitate tasks through design and programmed efficiencies |
| ***How Uday's uses of surfaces and implements support his writerly ways of thinking:*** |
| 1. Engage ideation and guard ideas |
| 2. Structure and cue mindsets and mental processes |
| 3. Sustain activity through good design |
| 4. Enable radically efficient and proleptic modification (alone and paired) |

Uday recalls first starting to write around the time he learned to type. His 'father had an oversized laptop' that he 'used to play with around from the age of 2'. At Columbia, Uday is 'ok with being an A minus student … and does not want to put in that extra effort'. He stated: 'I'm very bad at things I have to do.' Uday has never enjoyed academic writing and does not find it challenging. He does, however, 'like academic writing when it's under the pretence of when you can write whatever you want and make your own ideas.'

According to Uday, the one thing he does 'differently to most people is the way' that he will 'memorize text or memorize most things'. He is 'confident that writing something down helps memory but will memorize things by just committing things to his 'head and actively attempting to memorize something'. He notes that he chooses to use his 'time to play with ideas rather than simply work through storing them' Uday prefers working at his home 'desk – it's L-shaped and much easier to work on'. He likes writing amidst music or noise 'for things that are boring'. He explains: 'Something I've always found interesting about music is it can make you feel such a variety of emotions – and get you in that desire headspace … the psychological feeling of it – it's like a placebo … I get very self-conscious if I lose control of my brain … I like noise … even random noise … it makes me feel like there are other people in the world.'

The following two sections will elaborate on 6.14 to reveal how Uday's uses of non-digital and digital surfaces and implements support his writerly ways of thinking by:

1. engaging ideation and guard his ideas;
2. structuring and cueing mindsets and mental processes;
3. sustaining activity through good design;
4. enabling radically efficient and proleptic modification (alone and paired).

### 6.5.1 Non-digital Uses of Surfaces and Implements

As detailed further in Table 6.15, Uday's uses of surfaces and implements deepen his reading intellectually and physically; support and anticipate ideation; materialize and guard his ideas; and filter creative brainstorming.

**Table 6.15. When and why Uday uses non-digital surfaces and implements**

| **Non-digital surfaces and implements**<br>Frixion pens and Moleskin notebooks with blank or grid pages | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Deepen reading intellectually and physically** | |
| When reading | Always procures hard copy of books he likes: for feel of pages, absorption is higher; likes reading to be a focused, undisturbed activity, and to experience text as the author intended |
| **2. Support and anticipate ideation** | |
| Uses small notebooks with blank pages when he deals with ideas | It's a lot more free flowing |
| Occasionally uses small notebooks with grid pages | Because a computer screen is essentially a grid |
| Uses erasable Frixion pens when writing by hand | They are well designed: the ink is heat sensitive so the end is a rubber stamp |
| **3. Materialize and guard ideas** | |
| Always keeps one Moleskin notebook for transcribing that which it would be inefficient to execute on a text editor | Difficult to remove pages from a Moleskin: keeps everything together. Prefers to jot down ideas when it would take more time to load/start his laptop; otherwise, it simply is slower |
| Uses notebooks when taking notes during class that are not related to class | Taking notes for class is disengaging; prefers only to write his ideas – his own ideas |
| **4. Filter creative brainstorming** | |
| Always uses pen and paper whenever he has something creative to do | The filtration is valuable: it takes more effort (and time) so you naturally select what is important/essential; facilitates critical thinking about what one is writing |

Uday does not like 'reading on screens'. He finds 'that screens are distracting'. When looking at a screen, he thinks 'a lot of times it can be anything … that's what makes it cool'. Uday acknowledged that his 'view may change over time', recalling that he does 'keep a lot of [his] textbooks on [his] iPad' and that he does 'read online a lot'. However, he maintains that

‘nothing beats holding a real book’. Uday likes ‘writing in books and feeling books … and having a library’. He will ‘always pick up the physical copy’ of a book he likes, though he pondered whether this is because he enjoys ‘collecting books as well’. He adds: ‘I like the feel of pages. I think often times when you work so much with technology – certain things like reading … I like reading to be only reading. I also think absorption rate is a lot lower when you read off the screen … I prefer feeling the text much the way the author intended me to deal with it.’ This relates to Uday’s expectations of the ideal reading experience for retention: ‘It’s such a single-minded activity and I like that. I think the “tabbed” generation has us all believing that we get more done by keeping 15 tabs of stuff open on our computer but reading something needs sole attention for maximum retention. A good example is how many sites which have text have been adapting their pages to be more readable and focused on the content: large spaces on the side, focused text in the middle large font, readable paper-like typeface. It’s an entire shift in design thinking.’

Having become ‘quite familiar with typing and writing at a young age’, Uday ‘always found handwriting inefficient so took to typing as a superior method of writing – technically, at least’. His handwriting is ‘fast – but it sacrifices legibility for speed and speed for legibility so definitely much slower than typing’. Even so, Uday uses ‘non-digital writing tools to do stuff that cannot be done efficiently in a text editor such as … thought flows.’ He also ‘always keeps one notebook … for jotting down ideas when the time it would take to load up’ his ‘laptop would be too slow’.

Uday carries ‘a very thin bag – like one of those gym bags’ for keeping ‘a Moleskin or just a small notebook’. He likes ‘writing ideas in a moleskin’ because when he does ‘deal with ideas, it’s a lot more free flowing’. He will ‘use blank paper … [and] grid paper … because a computer screen is a grid essentially – so it makes [that] work way easier [for him]’. Uday adds: ‘the reason I like Moleskins is because you can’t tear the pages out so you have to keep everything together’. He writes ‘with erasable Frixion gel pens … The ink is heat sensitive so the end is a rubber stump.’ Uday explains: ‘I don’t like stuff where erasers can fade out so you have half a pencil and no eraser. It’s just not well designed. I think this is a far better designed tool.’ Since Uday only uses ‘one type of pen’, he ends ‘up throwing them away a



**Image 12: Uday's Frixion pens.**

lot because they have notoriously low ink' Uday does not use his notebooks for class notes': 'just for my ideas'. He maintains that taking notes for class is 'disengaging'. Yet he often attends 'class simply to get ideas and those ideas' he will 'jot in the Moleskin': 'So all my notes are actually not related to classes, they're my ideas – my own ideas'. Whenever Uday has 'something creative to do', he 'will always use pen and paper'. For Uday, the 'filtration part of it' is why he likes 'sketching things'.

Uday frequently returns to this notion of filtration: 'when you write stuff, you are naturally selecting what's important and what's to throw away'. He elaborates: 'writing stuff takes more effort on a very simple level – and time … the second you write by hand, it's not efficient. So you really want to pick what you want to put down and I think … when it comes to writing on paper … where writing is more intensive, you will get rid of stuff … and that process is nice because you realize that whatever you don't put down, it probably isn't that important anyway – so you always get to the essentials.' In the absence of a text editor, Uday agrees that 'handwriting is a very good way' to think critically about what one writes. However, he finds that 'a lot of people when they take handwritten notes, they just try to copy everything and that's not effective.'

### 6.5.2 Digital Uses of Surfaces and Implements

Uday uses digital and bi-manual surfaces and implements for syntopical[31] research and automated referencing; to minimize abstraction; to receive internal organization and production for fluid manipulation; and to facilitate tasks through design and programmed efficiencies; see Table 6.16.

**Table 6.16. When and why Uday uses digital and bi-manual surfaces and implements**

| ***Digital and bi-manual surfaces and implements***<br>iPhone and MacBook Pro, 15 inch, running Vi or Vim through his console | |
|---|---|
| ***Uses*** | ***Reasons*** |
| **1. Syntopical research and automated referencing** | |

[31] 'Syntopical' is used with reference to the fourth and ultimate level of reading outlined in Adler and Van Doren's (1972) *How to Read a Book.* According to the authors, at this stage – of syntopical reading – readers apply their knowledge of other texts to ask and to find answers to specific questions within the text at hand. Uday's approach to researching draws many parallels with syntopical reading – hence, 'syntopical researching'.

| | |
|---|---|
| Frequently reads from screens despite not enjoying the experience | Reads textbooks on iPad, though finds screens distracting and the absorption rate to be lower; must always suppress potential of screens for other tasks |
| Researches using academic databases | Has yet to write at a level where he needs to validate ideas beyond online academic sources; while going through the databases, he can create a text file with links, and names of the source, author, and page |
| Once he has completed his list of citations, he uses a bibliography creator | The application automatically generates and correctly formats his bibliography |
| Researches online after writing a draft or when he has a specific question that he thinks can be answered quickly | He rarely writes about a topic that he knows nothing about and prefers to integrate/implement research immediately |
| **2. Receive internal organization and production for fluid manipulation** | |
| Makes his organization work for him | Names all files with a serial code: year dot month dot day dot txt; though his desktop appears to be a mess, Uday knows where everything is |
| Uses Dropbox to move content from device to device, particularly after scanning and uploading a note | Easier and syncs across devices |
| Before drafting at the keyboard | Uday closes his eyes and tracks all of the thoughts in his head, trying to think through and visualize entire sentences and paragraphs so that he will be able to execute and to type efficiently around two pages every fifteen minutes; would rather fix on the thought level versus 'wasting' time writing and then editing, if possible |
| Prefers typing in full words to materialize the majority of his thoughts | Closest medium, aside from speaking, to communicate at the speed of his thinking; easier to transcribe thoughts before they change; the activity never feels intensive; can type at close to 100 words per minute, if not faster, so never needs to abbreviate or use short-hands (also likes his words to be complete): transcribing a word fully that has been processed internally is easier than modifying the word into an abbreviation (minimizing internal modifications / no need to add tasks) |
| After typing his mapped thoughts | Uday will tighten them |
| **3. Facilitate tasks through design and programmed efficiencies** | |
| Prefers design of monospaced font characters | Designed to sit perfectly on top of each other, which facilitates verbal comprehension |
| Personalizes font colour for communications | For individuality and readability |
| Selecting the appropriate file type when starting a text | Different file types have different formatting and exporting options; expects text editor to know file type and assist accordingly |
| When aware of the shortcuts that will benefit what he is writing, such as automatic indenting | He has customized Vim to suit his needs; it's easy to re-write what Vim does and how |
| When you open Vim, it's in edit mode – not insert mode – leading working with this writing tool to viewing the two modes equally | Begin to think of those two processes as one idea that contributes to the whole process, the writing process (not the act of writing); manipulating text – not actively thinking about one mode versus the other, as the tool is an extension of you |
| When transcribing text through Vim in 'insert mode' | When you are in one mode, you are restricted to its functions; the formatting has a total focus on efficiency; within each mode, Uday has programmed and can programme different shortcuts to deal with the text as he likes |
| When manipulating text through Vim in 'edit mode' | |

| | |
|---|---|
| When typing in Vi or Vim for the efficient haptic activity, including not having to remove your fingers from the keyboard. | Shortcuts on Vim are actually short and efficient; obviates using a mouse; keeping fingers active at the keyboard, facilitates staying in that style of thought. |
| When you click your mouse | You are actively leaving your engagement with the content being written; and aren't being productive – 'clicking leads to more clicking' |
| **4. Minimize abstraction** | |
| When doing paired working with his roommate on a 60' screen | As one programmes, one watches, to keep the coder honest and mistake free – saves time; when conducting paired working on one screen, it's called academic dishonesty |
| When using Vi or Vim for raw experience of manipulating text | Gives him closer interaction with his thoughts (it's really raw text); reduces the abstraction: Logos and toolbars are unnecessary; you don't need all features all the time; values simplicity akin to paper. |
| When typing in Vi or Vim for the efficient haptic activity, including not having to remove your fingers from the keyboard. | Shortcuts on Vim are actually short; values the efficiency of typing and programmed shortcuts; obviates using a mouse, which Uday; when moving your fingers so quickly without ever having to take them from the keyboard, you are more likely to stay in that style of thought. |
| Writing with a powerful text editor makes you think about text as building a house | Words are bricks and you stack them and interact with them according to the efficient modes, thereby simulating the flexibility and fluidity of manipulating text on a page |

Uday finds 'the computer a very useful tool for efficiency'. He uses a MacBook Pro '15 running Vi or Vim through his console 'for more or less everything'. Uday uses a 'standard keyboard with a keyboard cover for it.' He likes 'mechanical keyboards a lot because of the sound but' is 'not that particular – just basic QWERTY'. The keyboard cover is explained by Uday's view that 'computers are unhygienic'. Uday likes 'to wash the cover' and adds: 'If you think about how much you touch garbage and then use your laptop. It's ridiculous. Keyboards have the right amount of indentation to let bacteria just sit … keyboards can get nasty'. At Uday's apartment, there are 'two computers and three monitors': one for him, one for his roommate and a '60-inch TV for working together'. They 'use the big one for paired working' so when they programme, 'one can watch while one codes'. According to Uday, this keeps them 'honest and mistake free and saves time'. Uday adds: 'It's called 'academic dishonesty' when you do it for school which baffles me.'

For Uday, typing on his laptop 'never feels intensive'. Uday likes 'typing because it's the closest medium aside from speaking to communicate at the speed' at which he thinks. He adds: 'But you've had a conversation with me – I loop from idea to idea to idea at random. I like typing because I get my thoughts out on paper fast before my thoughts switch up.' Uday 'can

type at close to 100 words per minute if not more' and does not use 'shorthand'. He explains: 'I remember when people used to text back in the day and use abbreviations. That never was a thing I'd do. I like my words full. I like to speak in fluid sentences. I don't short form things because I don't need to. I think the only reason people do that is for efficiency but if I'm processing the word in my mind for putting the word out it's far easier for me just to get the entire word out'. He prefers 'monospaced font characters that sit perfectly on top of each other when stacked so it makes vertical reading easier'. His iMessages come through in 'Andale Mono' and 'a Columbia colour rather than terminal green for readability'.

Uday comments that 'DropBox made life much easier… being able to move stuff from device to device makes things a lot better.' He adds: 'If I write a physical note, I like to be able to scan it and throw it in my entire DropBox. I don't strive to be organized though. I like to make organization work for me'. Uday does 'name all of [his] files in a certain way … with just a serial code … which is another thing [about which he is] OCD … It's year dot month dot day dot txt.' If you look at his desktop, 'it looks like a mess' but Uday knows 'where everything is and everything has a very intentional name'.

After Uday writes a draft, he then researches 'the gaps': 'I rarely will write about something I know nothing about, at least in the level of academia that I am currently in'. As a result, Uday tends to research specific questions as necessary and will 'find a way to implement it immediately'. Uday prefers 'scanning all documents and using the other monitor to load them up'. He researches using 'big academic research databases – JSTOR or whatever else'. However, he has yet to write 'at a level where it is really necessary to validate ideas'. As he cites information, he creates a text file with links, name of the source, author and page. Once he is 'done with them', he will 'run them through a bibliography creator, which creates the whole thing, like a Bibme.'

Before beginning to transcribe, Uday will 'try to think through full sentences and paragraphs'. Uday will close his eyes and 'develop the entire idea and then execute.' He explains: 'This involves me moving through the entire process in my head before going in and putting a word down … I can typically track all my thoughts in my head. Once I have all my ideas, I stick them together and execute. This lets me efficiently type around two pages every fifteen minutes … I typically write my mapped thoughts and then proceed to tighten them.' Offering insights into how he manages the internal crafting of his papers, Uday adds that he

‘always looked at writing as a form of engineering where each word is a brick to build a house of ideas’ – an analogy to which he returns. Later, Uday elaborates on the efficiency of internal crafting: ‘I think I try to visualize whatever I do first even if it’s for a few seconds and then act on it. I can generally see what I’m going to write before writing it. I would rather fix it on the thought level versus wasting time writing it and then editing it (if I can). Naturally I think editing is key to any good work but the higher the level of fixing the more you can decrease effort of changing things’.

Uday uses a ‘text editor … that was built in the 1970s … 80s … called Vim. Uday adds: ‘it definitely shapes the way I think.’ Uday frequently discussed how Vim gives him ‘closer

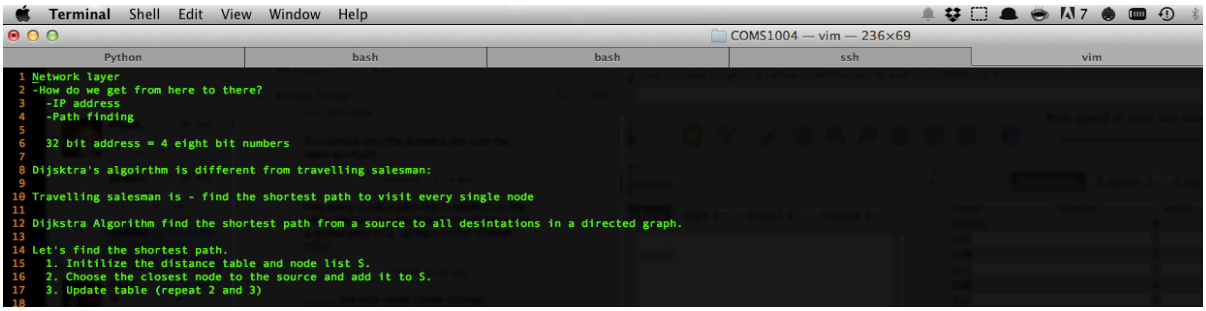



**Image 13: Uday writing a text file in Vim.**

interaction’ with his thoughts – brings him ‘a lot closer to them.’ For Uday, the ‘less abstraction the better’. He does ‘hate Microsoft Word’, which is ‘just so abstracting and bulky’. Uday explains: ‘see this stupid Microsoft logo … you have all this stuff here [points at the toolbar]. See, this stuff, to me, is not essential. I think good design is invisible. You don’t need everything all the time so why is it there … Whatever I need, it’s implicitly built into my keyboard – very similar to when you write on a piece of paper … you don’t have all these tools. If you want something, you can just reach for it and grab it … and I like that my computer does that because with the computer you are moving your fingers so quickly it’s even faster … so you have the benefit of the simplicity of paper but you also have the added benefit of the efficiency of the machine … it’s really raw text’.

Asked to discuss differences between features in Word and those he would programme and use in a text editor, Uday explains: ‘Spell check computationally is quite dense – plus autocomplete, so those are two very distinct features of MS Word but let’s say I’m using … any of these configurable editors: these editors need to work with all text. Word is only for documents. So when I start writing python or start writing text, it doesn’t matter. I want to use

the same tool. So instead of spell check, I'd prefer syntax highlighting. Instead of autocomplete I'd prefer suggestive autocomplete but I don't want it all the time. I want my editor to know the file I'm writing and assist in that file type. MS Word only produces .doc or .docx files. I want to work with text and all text … what do I need three or four headers for giving me options for bolding things and using subscripts? I can format that by using a file type that allows it (like markdown). It's faster to use my keyboard than use a mouse.'

Uday repeated that text editors are infinitely customizable, as it is 'easy to re-write Vim and the way it works'. Accordingly, Uday's Vim is 'extremely customized. It does automatic highlighting and indenting – it's hard to get leaner than Vim and still keep it stable.' Uday writes papers as .txt files that are 'just raw text'. For making notes, he likes 'using .md files (Markdown files) … [which] allow you to format things nicely and convert the formatting to webpages easily'. In the midst of the data collection, Uday tried switching to 'an instantly programmable text editor' but soon 'switched back to Vim because the amount of keys necessary for the commands in the other program was quite long'. Plus, Uday 'missed the efficiency'.

For Vim, 'the idea was that before this computer even had a mouse, you wanted to minimize the amount of movement of your finger'. When using Vim, because Uday does not have to lift his hands off his keyboard, he 'always can stay in that style of thought'. He elaborates: 'it's very easy to type when you know how to type well but when you reach for your mouse, you still leave the mode of typing. Imagine if, while typing, you had a way to keep typing instructions to your machine to do what you want but still keep typing.' Uday finds that the 'act of leaving the writing process – or just engagement with the content, is the time where you click that, and then you Google it, and you click that and you Google another link and before you know it, you are looking at lamas with pugs … and you just are not doing anything productive anymore'.

In Vim, 'there are actually two modes. There's one called insert mode and one called editing mode so you can switch between them by pressing escape but when you are in one mode, you are able to manipulate the text and when you are in the other mode, you are able to write – its formatting comes from a total focus on efficiency.' Uday 'used to be really scared of leaving insert mode because it just seemed weird to have an editing mode'. As he 'got more familiar with commands, it just became natural'. He added: 'Once you become familiar with your tools, you

want to use them fully and you just stop thinking about them as tools. They become an extension of yourself.'

While writing, that extension shapes Uday's conception of interacting with text. He explains: 'I think using a powerful text editor makes you think a lot about text like building a house. Your words are bricks and you are stacking them together … because if you have something explicitly called edit mode, you are thinking a lot about whipping the text into shape. So I'll be like "*ooooh"* that's not good and instead of having to highlight and delete the line, I'll put in a shortcut that will create a substring, cut out the word and get rid of it. Or it can store it into a register and I can return it.'

Despite the two modes, Uday is quick to emphasize: 'it's just a program. You are not thinking actively about one mode versus the other mode. It's just text manipulation. So it's not really text writing software. It's text manipulation software and one of the manipulations is writing … when you open Vim, it's in "edit mode", not "insert mode" which means that writing is another function of the editor at the same level as any of these other commands … when you have a tool that represents the idea of writing and editing equally then you start thinking of those two things as one idea that is part of a whole process, which is the writing process – not the act of writing.' A reason he likes 'Vi or Vim is because when you manipulate text like that you are able to simulate manipulating text like that on a page'. He does not 'think a lot of text editors today do that. Microsoft Word doesn't do that'. As a result, he feels that 'you don't think very critically about what you are putting on the page or how to shape it. You just kind of write it and it just turns into this endless mush of stuff'.

Before proceeding to a discussion of the findings from both the expert and student writers, below is an overview of how the students' writerly ways of thinking *primarily* were supported by their uses of surfaces and implements. These are not the only ways in which the given students' writerly tool use supported their thinking while writing, but the central relationships as determined by analysing uses and their reasons across non-digital and digital surfaces and implements. Thus, each set of relationships for each student spans both non-digital and digital uses of surfaces and implements. Despite using materially similar surfaces and implements (e.g. Moleskin notebooks and Apple computers), the students – as illustrated in Table 6.17 – have

come to use these tools in distinct ways relative to how they perceive and act, particularly while writing, as well as to their own writerly orientations, conceptions, and impressions.

**Table 6.17. How uses of surfaces and implements support each student's writerly ways of thinking**

| |
|---|
| **Amy** |
| Appease emotional concerns |
| Distil and receive writerly word and non-word thinking |
| Through the aggregation and accessibility of past work |
| Inform rhetorical and substantive decisions |
| **Matt** |
| Liberate writerly activity |
| Regulate internal crafting |
| Materialize ideation for modification |
| Perpetuate and enable evolution of substance and style |
| **Emily** |
| Reduce task load |
| Render gestation tangible and stable |
| Expand and organize the visible workspace |
| Facilitate paper evolution and collaborative editing |
| **Zoe** |
| Reinforce and refine internalization (reading and crafting) |
| Engender purpose through mental and physical associations |
| Promote confidence through tool accuracy and reliability |
| Enable temporal flexibility |
| **Uday** |
| Engage ideation and guard ideas |
| Structure and cue mindsets and mental processes |
| Sustain activity through good design |
| Enable radically efficient and proleptic modification (alone and paired) |

# Chapter 7: Discussion

Deriving from the study's findings regarding the professional and student writers, this chapter discusses how available surfaces and implements may support the scope of ways of thinking for writing. First, the collective findings were examined to identify themes among writerly thinking. The focus here was on what typifies thinking while writing among the professional and student writers alike, and – presumably – those in between. The commonalities identified provided the foundation for the second inquiry, which examined ways in which writers might constructively think about the range of writing tools available. Therefore, the ways proposed are rooted in an examination of how writerly tool use may be understood to support thinking for writing at all stages of writerly development. Accordingly, the chapter proceeds by outlining patterns among the scope of writerly thinking (Section 7.1) to propose ways of conceptualizing writerly tools inclusively (Section 7.2). Together, these sections illuminate fundamental interrelationships between writerly thinking and writerly tool use, and guiding principles for how student and professional writers might support those dynamics.

## 7.1 Writerly Ways of Thinking from Student to Expert

Chapters 5 and 6 examined a range of writerly ways of thinking while using surfaces and implements among professional and student writers, respectively. As noted, this study's scientific view promotes the individual mind as the lens through which to examine the writing process as a lived experience. That approach upholds the principle that those who write should aspire to master writerly thinking, including appropriate domain-specific writerly knowledge (i.e. mastering the writing of history would entail ways of thinking while writing that are specific to that discipline). Different writers at different levels may be analysed and compared, therefore, with reference to the nature of their writerly thinking. Accordingly, this section considers the writerly thinking of both the student and professional writers with reference to their uses of surfaces and implements.

Before introducing the key themes, two points from the findings on the range of writerly ways of thinking are reinforced here as they relate to Section 7.1. First, writerly ways of thinking reflect, as this study found, certain cognitive schema universal to a normally developing human mind. Ways of thinking while writing are not inherently relative and constitute fundamental

building blocks for conceptualizing the writing process. Nearly all writing processes feature, for example, certain ways of thinking, such as generating writerly ideas – whether for syntax, sentence content, or a thesis – or reflecting on visible text, irrespective of the tools used. Second, among both students and professionals alike, the full range of writerly ways of thinking is realized across the scope of available writerly tools. While Section 7.2.1 details the implications of this point for conceptualizing writing with technology, this section discusses the patterns and differences between the two groups of writers with regards to what is relative: how their writerly ways of thinking relate to their uses of surfaces and implements.

Examining the full scope of writerly ways of thinking reveals how constructive writerly tool use among both groups features 1) continual learning, and is 2) individualized and 3) embodied. Within each theme, key differences between the students and professionals illuminate the progression from novice to expert writerly thinking. In the three subsections that follow, each of the themes is discussed separately to explain how it is realized, key driving factors, and potential benefits for writerly thinking. Theorizing the scope of writerly ways of thinking accordingly seeks to substantiate a basis for what writerly tool use might support, in advance of the subsequent section's discussion of how it might do so.

### 7.1.1 Continual learning

**Table 7.1. Writerly ways of thinking feature continual learning with reference to uses of writerly tools**

| **Continual learning** | |
|---|---|
| ***Student writers*** | ***Professional writers*** |
| **1. How?** | |
| The process of writing and what is written is used to support memory. | |
| *Experimenting to enhance the written product*<br>Continually experimenting with new applications, writing software, and writerly processes (e.g. outlining) to support written work. | *Changing practices to facilitate thinking*: Routine writerly tool use is changed to support writerly thinking. |
| *Consuming content through digital devices for inspiration for a particular assignment and for ideas*<br>The aggregation of past work and delivery of new content through digital devices offers learning for inspiration and content. There is also a desire to consume information and to play with ideas rather than learning them out of obligation. | *Learning about the nature of ideas and their development*: Ideas become 'irresistible' with time and effort. Writers persevere, sustaining transcription, during periods of gestation before revelations. |

| | |
|---|---|
| *Affirming ideas through the connectivity of digital devices:* Easily accessible information and feedback facilitate the validation of ideas and arguments. | *Learning through what the mind selects and the hand transcribes*: Writers withhold judgement to release mental activity through transcription for learning. After internal crafting or dwelling, eventual transcription – the process and outcome – illuminates writers' thinking. |
| *Enhancing written work through the efficiency and aggregation of digital devices:* There is an appreciation of the accessibility of digital formats for tracking changes and comments, and sharing their work. | *Learning in the mental activity behind transcription:* Writerly tool use entails endless, consequential decision-making. |
| *Different mindsets are associated with different writerly tools:* Writerly tools are conceptualized in ways that inform semantic and rhetorical decisions. | *Learning through the experiential process of transcription:* Writers look to become increasingly aware of nuances and possibilities (e.g. recursive experiments are performed to find something new). |
| **2. Driving factors** | |
| *Time:* Both as a constraint and a requirement (i.e. putting in the hours). | |
| *Understandings of learning while writing:* Writerly desire to learn in which ways for which purposes. | |
| *Understandings of writing:* Conceptions and perceptions of what writing entails and what writing is (including the merits by which it ought to be evaluated). | |
| *School:* Instructional experiences and learning (e.g. rules, essay structures, writing exercises). | *Writerly knowledge:* Command of written language and ideas, the crafting and organization of narratives and arguments – mindful of reception. |
| *Technology:* Understandings of its functions and what it provides access to. | *Writerly skills:* Motor skills and techniques to facilitate thinking. |
| *Social contexts*: As providers of feedback, affirmation, and distraction; and influences on identity. | *Writerly behaviour:* Awareness, reception, and interpretation of stimuli – visual, tactile, and experiential – while writing, the effort and attention involved in repeated and formative experiences. |
| **3. Benefits for writerly ways of thinking** | |
| *Resources* to inspire and with which to engage writerly ways of thinking are easily accessible. | *Continual insights:* For writerly ways of thinking, with benefits for use of writerly tools and the written text. |
| *Opportunities:* For developing ideas and for learning while writing abound. | *Deep understandings of ways to learn:* For continual insights and writerly development. |
| *Organized and efficient processes:* Fluid transcriptions and digital features liberate thinking to focus on writing and raw text. | *Continually updated learning priorities:* Abilities are accurately understood and continually assessed to inform and to drive progress. |

Learning science proposes that mastery entails the steady development of knowledge, theoretical understandings, skills, and the ability to apply and to make appropriate decisions by orchestrating those domains (Brown et al., 2014). This study's findings indicate that writing, like learning, involves the continual interweaving and retrieval of information, problem-solving without knowing and often in the absence of a solution, and critical analysis and comparison. Thus, the sophistication of writerly ways of thinking may be understood not according to what thinking occurs but *how* the thinking is practised: how problems are being solved and ideas being constructed, how information and knowledge are being retrieved or applied and with how much

effort, and how critical thinking and written language skills are being applied. Accordingly, the mastery of ways of thinking may be understood as the steady development of writerly knowledge, conceptions, and skills – practised and applied with increasing harmony. As the findings indicate, mastering writerly ways of thinking is a process of continual learning – one that is never fully realized.

Examining the student and professional writers through these understandings reveals how continual learning characterizes not only the practice of ways of thinking while writing, but also how writerly tools are used to promote and to sustain learning. With reference to writerly tool use, continual learning occurs in diverse ways with apparent differences between the two groups of writers – both in terms of the types of learning that occur and the driving or contributing factors. The differences between the professional and student writers reveal the formative roles of writerly knowledge, objectives, and – primarily for students – educational directives for how writers learn with reference to writerly tool use. This section continues by examining the differences between each group of writers in further depth.

Professional writers purposefully learn and create opportunities for learning to enhance the sculpting and the content of their ideas and written work. As the indicators outlined in Table 7.1 reveal, learning is sought through a writer's intimate interaction with his or her own mind, while producing and processing written text. Accordingly, the continual learning of how to use surfaces and implements while using them builds on deep and confident experience with thoughts, the development of ideas, the defence of arguments, written language, and writing. That experience entails a honed and continually developing attention to the precision, cohesion, and clarity of every written detail and its reception. It remains vigilant to the spontaneity of ideation and new knowledge, and continues to be intensified and sharpened by the perspective of time. Ultimately, professional writers direct their learning to benefit their writerly thinking, including their choices and the frames of reference through which they make them. Professional writers maintain that the majority of their writerly choices matter, but they also have the capacity to discern which decisions require thought, which may be left to intuition, and those that are beyond their control. Thus, not only do the actual decisions matter, but also the factors that contribute to the making of the decision.

For student writers, learning with reference to writerly tool use is diffused through and responsive to their educational, social, and technological contexts – those with which they are

familiar. Student writers are driven to use writerly tools to learn while seeking to satisfy academic and collegial expectations, and to compensate for uncertainties. Academic expectations and instructional experiences, in particular, provide frameworks through which student writers explicitly structure and monitor their writing and, implicitly, their writerly thinking. Through those frameworks, they substantiate their work through information from a range of resources, suggestions from peers, and effortless – although not necessarily accurate – enhancements from word-processing tools. Such excessive consumption of information and notes without clear reasoning drives student writing processes particularly when mental effort is constrained within the realm of intention – where writerly thinking and the written text are consumed by what one intends to say. When capacity is burdened and resources are limited, considering the meaning and cohesion of what actually is written and its reception rarely receive sufficient attention.

With effortful internalization, and critical synthesis and analysis skills, learning from a plurality of sources in different media may inform complex knowledge crafting while writing. This, however, reflects a certain view of what writing is: thinking. An emphasis in writing instruction on the written text, as discussed by the students, seemingly leads many of the student writers to focus on what is visible – and explains, in part, the amassing of visible information before and while composing, with minimal synthesis. Uses of surfaces and implements are integral to materializing the writing process and to managing its externalization. This externalization is formative, especially for those with little assurance in or needing validation of their ideas. Those who exhibited steady writerly poise, conversely, incorporate and manipulate information at the thought level. To those processes, stimulation provides critical inspiration; and the processes of externalization, of transcribing, offer opportunities to refine and to learn from their thoughts. This suggests that the student writers are distinguished by different understandings of and capacities for writing, with varying levels of confidence in the quality and development of their ideas when writing.

In addition to differences in contributing factors and understandings of what writing is, the student writers do not always turn writerly learning opportunities into learning moments. Frequently used word-processing features (e.g. Spelling and Grammar), do not translate into moments of learning proper spelling or new words. Rather, the features are used repeatedly and automatically as reliable ‘quick fixes’. Instead of exerting the cognitive effort to encode the new information – whether a word or grammar lesson – for future retrieval, students are seduced by

the ease of making enhancements to their work with minimal cognitive effort. In addition to certain behaviours and degrees of awareness, this reflects an assumption among the students, as frequent technology users, that technology serves to make tasks easier. For those who continue to struggle with vocabulary, spelling, and grammar, the automation of addressing such issues renders errors no longer acceptable, but offloads the requisite knowledge and understanding. Consequently, the finished product may mask the application of writerly thinking, while the knowledge gaps persist, and their negative consequences go unnoticed.

Though students struggle with finding value in writing instruction for their writing, the lessons that they have taken continue to guide their processes and to frame the ways in which they learn with and though their surfaces and implements. Where writing instruction has not directed their attention, rarely does purposeful learning occur. Learning among the professional writers – its priorities, motives, and benefits for writerly thinking – indicates why writing instruction might design its teaching practices and learning environments to nurture the development of strong foundations in writerly knowledge and to nurture writerly thinking. The benefits for continual learning while writing, let alone with writerly tools, would be pervasive and endure.

### 7.1.2 Individualized

**Table 7.2. Writerly ways of thinking are individualized when using writerly tools**

<table>
<tr><th colspan="2">Individualization</th></tr>
<tr><th>Student writers</th><th>Professional writers</th></tr>
<tr><td colspan="2">1. How?</td></tr>
<tr><td colspan="2">Functions and features of writerly tools: Conceptualizations of the functions and features of surfaces and implements differ.</td></tr>
<tr><td colspan="2">Nature of inner thinking: Nature and capacity of inner mental activity (words, thoughts, pictures, sounds) is individualized.</td></tr>
<tr><td colspan="2">How, when, and where writing is practised: Writerly processes (e.g. deep internalization) and writerly tasks occur in different places and at individualized times relative to the text in progress.</td></tr>
<tr><td colspan="2">What is written: Writers take notes and mark drafts with individual gestural liberties and symbols.</td></tr>
<tr><td>Merits by which writing is assessed: Student writers hold individual views of what writing means according to genres and formats, and academic subjects, conventions, and expectations.</td><td>What is worth writing: Views of what is worth transcribing (e.g. fragments or complete sentences) differ.</td></tr>
<tr><td>Language abilities and their implications: Student writers make use of digital tools available for writerly tasks to satisfy individualized ways.</td><td>What needs to occur before and while writing: Rituals and tasks to perform while writing vary among individual writers.</td></tr>
</table>

| | |
|---|---|
| *Emotional states and their influence:* Student writers have individualized emotional writerly needs. | *What ought to occur while writing:* Writers hold individual expectations of how the writerly thinking should feel and proceed with reference to the writing process. |
| *Connectivity:* Maintain connection to social life and digital information sources through individualized writerly tool set-ups. | *How linguistic and textual elements shape thinking:* Implications of textual elements (e.g. linear text as constraint) for thinking differ among individuals. |
| *Self-regulation:* Student writers individualize their tools and settings to minimize distractions. | *How text is seen and interpreted:* Preferred ways of seeing the text and meaning are derived individually from the visual stimuli. |
| **2. Driving factors** | |
| *Writing with technology is not well understood:* The experience of using technology while writing, let alone how to use technology for writing, is little understood. | |
| *Writing is inherently personal:* Writing, by nature, draws on the scope of human experience and communication, which are personal. | |
| *Understandings of how to practise and to develop writing vary:* Mental activity is viewed as being unpredictable, and writerly impressions and conceptions of the writing process vary. | |
| *Feelings and priorities (e.g. efficiency):* Social and emotional states, and informational connectivity, and design preferences. | *Individualized writerly orientations, impressions and conceptions* |
| *Understandings of personal writerly strengths and weaknesses*: Student writers have individual, self-identified writerly weaknesses. | *Understandings and expectations of writerly tools*: Perception of technology abilities varies by individual and with reference to individual devices. |
| **3. Benefits for writerly ways of thinking** | |
| *Personalizing to create supportive contexts:* Student writers identify and mitigate barriers to productive writing. | *Personalizing to release thinking:* Calibrating individual mechanics with perceptions of the execution prevents the thinking from being constrained. |
| *Personalizing to embed constructive practices*: Individualized practices promote organization and efficiency to build capacity for writerly thinking. | *Personalizing to support thinking:* Impermanence of text enables low-risk production and continual modifications, while integrating diverse sensory processes offers new perspectives. |

Beyond ways of learning while writing, this study finds that the scope of uses of surfaces and implements is characterized by individualization. Writers use their writerly tools in distinct ways according to their own abilities and reasons. In contrast to the differences among ways of learning, individualization by both groups features notable similarities in what is individualized and the driving factors. When, where, and how they practise writing, the nature of their inner thinking and what they write, and their understandings of the functions and features of writerly tools available – are all individualized. Even so, there are key differences among the writers with implications for how writerly tool use might benefit writerly thinking. This section proceeds by drawing on Table 7.2 to discuss how writerly tool use is individualized among student writers and professional writers, and the respective driving factors and corresponding ways in which writerly thinking may be supported.

Both groups of writers individualize their writerly tool use in ways that give personal meaning to writerly elements and processes that either are not featured in instruction or remain

otherwise ambiguous. Writerly tool use inherently integrates complex concepts and processes that are rarely explicitly identified and understood independently, let alone interrelated – as this study has endeavoured to examine. Given this ambiguity, the use of writerly tools to craft inner thinking into written text raises many questions and few solutions. What form and substance might inner thinking take and how might it be realized for writing and as written text? What are the functions of writerly tools for such thinking and transcribing? The uncertainty raised by these questions is resolved by both student and professional writers through continuous individualization. However, the ways in which they do so feature evident differences, which may be explained by prior or existing ways of thinking and by contributing factors. Students' writerly thinking is shaped by the assessment of their work, their language abilities, and the nature and regulation of their emotional states and connectivity, particularly while writing. By comparison, the professional writers primarily individualize the structures for their writerly thinking, and the interpretation and meaning of elements of written language and knowledge crafting.

In line with the finding that writers individualize tool use to give meaning and structure to unclear and ambiguous elements of the writerly experience, what is not well understood, explained, or taught appears to drive the individualization. As discussed, understandings of writing are complex and disconnected owing to, *inter alia*, diverse views on what writing is and its interdisciplinary nature. With reference to writerly tool use, the findings indicate that the tacit and fragmented nature of those understandings is compounded by similar understandings concerning how to conceptualize writerly tools and their use. Therefore, attributing instances of individualization to a single factor would unrealistically simplify the dynamics and related theorizing. Nonetheless, which writerly elements are individualized and why illuminates the scope of writerly ways of thinking.

Turning to differences between the two groups, the influences of their distinct contexts and identities become evident. The student writers navigate the norms, expectations, and interpersonal dynamics of being both college students and writers in a competitive, urban, academic environment. As such, they are often faced with situations that are not always related to their writing but affect their external and internal conditions while writing. Further, while writing the student writers are continually mindful of the qualitative assessment of their work – through the anticipated comments and grades. Lacking firm writerly knowledge, students have views of their own writerly strengths and weaknesses that are shaped and reinforced through

practice and feedback. The students integrate their writerly tools in individualized ways according to their self-assessments of their own abilities, taken from their individual educational experiences. Unlike the student writers, the professional writers tend to individualize their writerly tool use with reference to their nuanced understandings and expectations of the surfaces and implements, as well as their related writerly orientations, impressions, and conceptions. The focus on the immediate process of writing – versus contextual influences – may be attributed to their intimate and extensive experience with and reflection upon their tools, even if their views continue to evolve.

How each group individualizes their writerly tool use to support their writerly thinking reveals the implications of the different driving factors. Still operating at a distance from their ways of thinking while writing, the student writers devise creative ways to personalize the surrounding contexts in which they write and the practices before and while writing to nurture and to create space for their writerly thinking. Operating in individualized writing contexts with access to one's personal things, necessary surfaces and resources, organization systems, and programmed shortcuts, however, does not guarantee benefits for writerly ways of thinking. Rather, the extent to which the students personalize the spaces and management of their writing merely sets the stage. Nonetheless, they are stages from which their writerly ways of thinking, potentially, could fly. The professional writers, by contrast, personalize their writerly tool use in ways that directly shape their writerly thinking. Such ways include orchestrating their transcription to perpetuate, or at least not to disrupt, their writerly thinking. Personalizing transcription – the speed, the haptic activity, the written result – through the range of surfaces and implements, sustains and supports writerly thinking.

### 7.1.3 Embodied

**Table 7.3. Writerly ways of thinking are embodied when using writerly tools**

| **Embodiment** | |
|---|---|
| ***Student writers*** | ***Professional writers*** |
| **1. How** | |
| *Writerly thoughts occur during movement, and at a distance:* Prose form and prose are captured throughout regular daily physical activity, while away from one's work. | |
| *Physical engagement sustains and perpetuates mental engagement:* Interactivity of writerly tool use is proleptic, particularly with digital devices. | |
| *Writerly tools available offer diverse sensory stimuli and experiences:* Different writerly tasks and components offer different sensory experiences with different implications (e.g. handwritten text 'begs to be edited', and visual feedback stimulates 'muscle memory' and indicates progress). | |

| | |
|---|---|
| *Different ways of thinking are associated with different writerly actions and activity:* Writers seek to process what is being written through different modes of transcription for the different processing experiences – and to solve problems (e.g. handwriting facilitates problem-solving while typing provides new perspectives to identify solutions). Different writerly actions may entail different speeds and levels of intensities. | |
| *Different surfaces and implements afford distinct temporal and spatial vantages:* Altering writerly action and perception offers different perspectives. | |
| *The connectivity and mobility of digital devices dissolve boundaries between writerly thinking and existence:* Technology is embedded in reality, shaping language, relationships and creativity. | *Space for thinking is sought through physical separation:* Writers create distance from their tools for thinking. |
| **2. Driving factors** | |
| *The process of writing is embodied:* Writerly tool use entails physical activity and sensory experiences. Continuous sensory feedback through action and perception while writing is proleptic and facilitates deep internalization. | |
| *Understandings of the processes of writing and writerly elements are embodied:* Writers use their tools to broaden, deepen, and extend; documents contain headers and footers, and body paragraphs. | |
| *What one writes often entails multiple dimensions:* What is being transcribed often seeks to capture a lived experience, which entails action and perception. | |
| *Writerly background:* Experience with and expectations of writerly action and perception mediate temporal and spatial needs for writerly thinking. | |
| *Operate in multiple contexts and spaces:* The student experience operates in many different physical spaces and contexts. | *Relative malleability of related mindsets*: Professional writers hold firm associations and beliefs to safeguard writerly thinking. |
| **3. Benefits for writerly ways of thinking** | |
| *Application of writerly action, perception and intuition:* Writerly intuition is engaged and applied. | |
| *Sharpening of thinking:* Physicality of transcription sharpens thoughts, and different ways of processing and experiencing written text are revealing. | |
| Writerly thinking may transcend social and physical boundaries, and operate in new spatial and temporal structures. | |

While writing and thinking about writing, one embodies and performs gross and fine motor activity, engages space and time perception, and processes tactile and visual stimuli. As alluded to throughout the previous sections, both groups conceptualize their writerly tool use with reference to tangible experiences and visual forms. Through their frequent references to the physical interaction with and sensory engagement of their writerly tools and the writing process, the writers collectively reveal ways in which the lived experience of writerly thinking while using surfaces and implements is embodied. Such experiences among the student and professional writers are quite similar. Owing to the underpinning nature of human physiology and the embodiment of writing, such experiences are likely to be analogous, irrespective of the quality of writerly ways of thinking. Even so, this study's findings offer insights into the making of meaning through embodied experiences while writing. Given this study's view of writing as thinking, this section proceeds by discussing two categories of experience: 1) different writerly ways of thinking associated with different writerly actions – movement and posture, typing and

handwriting; and 2) the implications of different writerly tool uses for revision. The discussion then considers a key, related finding – the role of space and time in writerly action and perception, before concluding with suggestions for how embodiment may be conceptualized to benefit writerly tool use.

In addition to ways of thinking, writers draw on a range of actions while writing, and associate those different actions with different ways of thinking. They prefer different postures while using their writerly tools and incorporate a range of movement while engaged in or attuned to writerly thinking. Though the full range of relationships is beyond the scope of this section, the critical point is that different relationships – between writerly thinking and hand activity, posture, and bodily movement – with the range of available surfaces and implements engender different experiences of writerly thinking. Even so, there are some common tendencies. Numerous professional writers write lying down or standing; the seated position is not the only posture for writing. Many writers ground their generative writing processes by hand, drawing on the singular functionality of pencil and paper – and the degree to which one may control the transcription. Other writers prefer to dump their ideas with the fluidity and speed of typing, externalizing their inner content as quickly as possible for the visible form. The ease of recursive modifications drives many writers to make iterative changes to their ideas as they type. Some writers maintain that typescript on a screen appears sterile and ought to appear clean, while the sight of handwriting triggers an urge, among others, to edit.

The modification and marking of text is integral to revising. Another process at the core of revision is reading what has been written thus far. As discussed, both the professional writers and the student writers in this study associate writing by hand and typing with different ways of thinking. They also reported that the visual experiences of reading from paper and screens hold different meanings in general, let alone while revising. Research finds that reading is embodied. Not only does the retrieval of letters written by hand involve the activation of the neural processes involved in their physical construction (Kiefer & Trumpp, 2012), but the reading of individual words (Pulvermuller, 2005) and stories (Speer et al., 2009) activates the visual and motor regions that would be involved in the lived experience of those actions and narratives. Along with this study's findings, this research suggests that different embodied uses of surfaces and implements have implications for writerly thinking while revising. When writers revise, however, their actions and perception also are (and have been) shaped by their practices – how

they were taught or have learned to revise. For the student writers, those practices are shaped by the frameworks taken from their instructional experiences and, as will be discussed below, their conceptions of time. Many student and professional writers prefer to type complete drafts, and to print and to edit with their critical observation and analysis skills activated by pencil in hand. The embodiment of both the mode of transcription and the processing of the visual stimuli minimizes abstractions and distractions while revising.

The embodiment of these experiences, for both groups of writers, is also shaped by perceptions of time and space. Writing spaces (where one writes), surface space (on what one writes), actual and perceived distance from the writing process – and its integral components, and layout (how the page is set up and the text is laid out) –were all cited as evidence for the role of space in writerly tool use. For those who prefer to compose and to revise without their gestures or layout being constrained, paper offers an unparalleled flexibility. Many writers, for example, reported a preference for writing in the margins or revising with spontaneous marking. Composing on digital surfaces offers different flexibility, particularly in terms of where one writes. Such versatility is facilitated by the portability of digital devices, and the ability to access documents remotely through their connectedness.

Though both groups of writers make use of the range of spatial experiences, their reasoning behind, say, working in one space versus another may not be about the actual space. As noted, one student writer prefers to compose in spaces where she does not feel self-conscious. Her tendency to write in her bedroom is not a function of the bedroom space but of how it mollifies her emotional state so that her consciousness focuses singularly on her writing. Similarly, movement through time and space for another student is driven by a desire to sense progress and for affirmation. Such psychological and emotional needs are satisfied through the accretion and sorting of visible feedback (e.g. making lists) and tangible interactions with the text (e.g. crossing out items). Further complicating students' psychological and emotional states, the physical and conceptual space between their academic and social communications, in text, has been dissolved. Social communications take the form of written language, and occur within academic spaces both offline (e.g. classrooms and lecture halls) and online where screens render multiple windows for distinct purposes simultaneously visible.

Merging writerly and non-writerly spaces both online and offline, students' writing time is continuously invaded by and abandoned for a variety of unrelated tasks. Meanwhile, students

are quick to cite deadlines and time pressures when discussing the implications of time for their writerly tool use. Constrained by the burdens on their time, students maintain that they have little time to write to the best of their abilities. Their thoughts about time inhibit their thinking for and while writing. The students concede that they know they could allocate their time more effectively both while writing and in general. Simultaneously, they expect technology to create efficiencies and realize that their use of digital writerly tools often does create efficiencies. Any time liberated by the use of technology, however, seems to be consumed by non-writerly activities. By contrast, time for professional writers is discussed with reference to their writerly ways of thinking. Writing requires putting in the hours, ideas become irresistible over time, and the interleaved periods of reflection are essential. Throughout these experiences, the professional writers anchor their time through their surfaces and implements.

While interconnected experiences of reality evolve and increasingly dissolve physical boundaries, writerly tools will continue to provide clear and concrete pathways and destinations for writerly thinking. Nonetheless, the findings from this study remind writers and researchers that the embodiment of writing is not new and is fundamental to the writing experience. Varied actions and sensory experiences may be realized through the range of surfaces and implements available when writing – with each factor having different implications for writerly thinking, the concurrent writerly tasks and, by extension, the writing process. Further, digital surfaces and implements offer new ways to experience and to make use of writerly action and perception in the variety of spatial and temporal constructs that writerly thinking navigates. The frontiers for exploring and experimenting with the embodiment of the writing experience are vast.

## 7.2 How writerly tool use might support the scope of ways of thinking while writing

Section 7.1 integrated the range of writerly tool uses to examine patterns throughout their relationships to student and professional writers' writerly thinking. As such, it provides a basis for determining how writerly tool use ultimately might be conceptualized to support the scope of ways of thinking while writing. From that basis, conceptualizing key supports began by aggregating uses of writerly tools across both groups. Those uses were then assessed with reference to the supporting ways outlined for the professional writers and the student writers, separately, in Chapter 5 and Chapter 6, respectively. To account for individual variation and interpretation, the resulting suggestions are grounded with reference to writerly thinking for and while composing.

Therefore, the suggestions reflect two key points. First, as writing is thinking, the proposed ways of thinking about writerly tool use aim to serve writerly thinking. For those writers in the earlier stages of developing their writerly thinking, the suggestions may challenge them, as they are encouraged to engage such thinking directly and critically. However, each suggestion outlines a way of thinking about writerly tool use that a writer at any stage in the development of their writerly thinking might adopt and, hopefully, find useful. Second, each suggestion that follows does not specify which tools to use. Rather, the scope of writerly tools available offers different benefits for different individuals in different settings. This encourages writers to explore opportunities for and the implications of further learning, personalization, and embodiment through their writerly contexts.

### 7.2.1 Support preferred mental and embodied states for and while writing

Writers coordinate their uses of writerly tools in a range of purposeful and subconscious ways that support preferred mental and embodied states for and while writing. Rooted in findings concerning the lived writerly experience, the use of 'mental and embodied states' refers to the diverse states of mind and physiological states that a writer initiates, inhabits, and sustains in anticipation of or while writing. Numerous examples of states of mind and physical activities, postures, and comfort levels sought before and while engaging writerly thinking are cited throughout this chapter and the previous two. Such individualization is captured in the suggestion through its qualification of 'preferred'. Not all writers, however, possess an explicit awareness of their *preferred* mental and embodied states. Thus, integral to utilizing this suggestion are the personal processes of distinguishing and learning states that are and are not conducive to one's own writerly thinking. How one might 'support' such states, as implicitly raised by the phrasing of the suggestion, includes, for example, creating and seeking productive, surrounding environments; reducing opportunities for physical strain and social and emotional distractions; and organizing writerly objects for internalized organization. Though these examples convey an explicit or purposeful intent, such practices often follow or entail subconscious activity.

Owing to the findings that preferred mental and physical states are not always self-evident and often operate at a subconscious level, what they might be and how one might identify them deserves consideration. Research suggests that different contexts and emotional states realize different competences, such that diverse conditions and circumstances influence

how activity performs (Fischer & Bidell, 2006). Accordingly, prior to and during productive writerly thinking, a variety of factors contribute to performance. Those factors and the nature of the present mental state inform the writerly thinking. Thus, to appreciate contextual variation and feedback from activity (Fischer & Bidell, 2006), understanding which supports contribute to optimal performance becomes essential. Incorporating metacognitive strategies, such as remaining vigilant while writing and reflecting upon every detail, offers one approach.

Understanding the circumstances that support mental and embodied writerly states and what those states are may be complicated by digital devices. The interconnected nature of writing with technology and the frequency of task-switching is captured by the tendency, noted by the student writers, to alternate between composing academic writing and typing social communications on the same devices, while also changing contexts offline. Digital devices facilitate mobility through those offline contexts because of their portability, connectivity, and aggregation of tools and past work. This allows students to work where they please and to access what they need. Though contextual variation seems nearly boundless, students continue to write throughout these diverse environments. This continuous practice affords numerous opportunities for apprehending the characteristics of constructive circumstances. For example, each of the student writers cited, with reason, a particular place – whether in a certain room, in a bed, at the library, or at a specific type of desk – where they preferred to do their composing. While some seem to seek minimal distractions in their writing space, others seek the opportunity for physical comfort and white noise. Thus, through the consideration of one's circumstances, factors contributing to productive dynamics become apparent.

### 7.2.2 Inspire and structure writerly thinking for composing

When composing, writerly tool use offers tactics and supports that help to inspire and to structure writerly thinking. Here, 'inspire' refers to the processes of stimulation that writers experience and seek from their surrounding contexts and inner lives. Such inspiration contributes to content and to process, and is synthesized, organized, and applied in dynamic ways. Accordingly, the use of 'structure' refers to the iterative processes of establishing and constructing relationships among writerly ways of thinking to produce written text. Substantiating inner and written thoughts while building and organizing their interrelationships, the processes of inspiring and structuring writerly thinking entail creating, reasoning, enquiring, and analysing.

Writerly tool use inspires writerly thinking by offering access to external stimuli for composing and to inner states that the process of writing prompts while composing. Digital writing tools, for example, render diverse content and past work easily accessible, while the process of putting pen to paper cues consciousness precisely to what flows through the hand. Key to each of these concrete examples is one's orientation to and processing of their inner states and surrounding contexts with reference to composing. Information and activity offer inspiration, provided one is oriented appropriately and cognizant. This reveals how particular mental and embodied states, as discussed, underpin how one uses and makes use of writerly tools for inspiration.

If inspiration may be understood to benefit the substance and form of writing, then the structuring of writerly thinking supports the integration of cohesion – in process and outcomes – and reception. Writing involves organization and construction at the thought level, on the page, and in between the two. Each realm offers different properties and experiences, with corresponding ways to support organization efforts – whether the thinking is not formed, constructed internally, or a hodgepodge of written notes. Examples of using writerly tools to structure writerly thinking include giving abstract ideas concrete grounding through the internalization of writing surfaces and implements (internally crafting thinking); distilling one's thinking through the feedback offered in its visualization (clarifying what one is thinking); assigning different processes to different tools (designating different spaces for different ways of thinking); and assembling and tracking ideas in their written form (monitoring and integrating writerly thinking for the written text). Though certain devices may alter the amount practised, ultimately effort remains critical to structuring writerly thinking.

Owing to the processes of synthesizing inspiration and the effort in structuring writerly thinking, the abundance of content and opportunities for the automation and fragmentation of tasks through digital devices raises potential challenges. Writing, by nature, is a process of radical limitation, which digital connectivity dramatically changes. By increasing the amount of content, diversifying the modes available, and expanding accessibility, digital devices and their connectivity benefit writing provided the writerly thinking is equipped to navigate and to use such a profusion of inspiration. Turning to the structuring of writerly thinking, digital devices automate the processes of cutting, copying, and pasting text in ways that enable a non-linear yet fluid process with implications for when and what type of thinking occurs. At a more micro

level, the ability to delete and to re-type with no visible trace changes the conditions in which words are selected and syntax is constructed. As these examples attempt to convey, the varied ways in which tasks are automated alter how writerly thinking may be sequenced. Digital, connected screens also offer new ways to use and to navigate space. Screens provide access to multiple 'desktops', windows, documents, and pages – each with different conditions and demands – which may be navigated with simple clicks and gestures. Whether overlapping or on screen simultaneously, different spaces present distinct semantic relationships that writerly thinking must synthesize and structure, eventually. Accordingly, writers must question how the stimulation and automation in their individualized uses of digital devices enhances or detracts from the inspiration and structuring of their writerly thinking.

### 7.2.3 Sustain writerly thinking during transcription

Writerly tools may be incorporated within one's writing practices to sustain writerly thinking during transcription. Transcription entails the transformation of word thoughts into written text through, *ad minimum*, the coordination of writerly thinking and haptic activity while using writerly tools. Writers recount how, in certain conditions, the activity of transcribing creates and fuels momentum. Specifically, writerly tool use may pace and sharpen the development of written thoughts, elicit intuitive thinking for states of flow, and have a proleptic effect driving interactivity. Integral to the realization of each of these dynamics are the conditions of the situation and their synchronization.

Immediate factors in such synchronized situations include the writer's knowledge of what they are writing and intend to write; the pace at which the writer is capable of thinking while transcribing; the maximum speed at which the writer may transcribe while using the selected tool; and the embodiment of their writing tools – how the tactile and physical engagement is mediated by cognitive activity. Thus, different tools sustain writerly thinking during transcription in different ways depending on writerly knowledge, subject-matter knowledge (knowledge about what one is writing), production speed, and the embodied experience. Synchronizing these conditions may give momentum to the range of intended and unanticipated ways of thinking. To achieve that harmony, however, each condition must be sufficiently substantiated or developed in isolation for the transcription to be worthwhile.

Owing to the variation distinguishing one writing moment from the next, writers may find that sustaining writerly thinking benefits from incorporating different uses of writerly tools.

Calibrating conditions to sustain writerly thinking is particularly challenging when the writer does not know what they intend to say and tends not to think in a structured or cohesive way. However, many writers note that they discover what they want to say through the process of transcribing.[32] *Ergo*, each element in a given writing moment should be accounted for *relative* to the writer's individualized process: writers must make the uses work for their writerly thinking. At the same time, during such subjective transcription processes, writers should also be mindful of the extents to which repeating automated activity and defaulting to immediately accessible thoughts sustains writerly thinking. Digital devices, as discussed, seduce activity and condition interactions through automated processes and tactile and visual feedback. While potentially mindless and redundant, such interactions also have the potential to be proleptic and to sharpen the thinking.

### 7.2.4 Nurture autonomous revising

Uses of writerly tools nurture autonomous revising by supporting readings of drafts, enabling preferred ways of marking drafts, and facilitating access to feedback, all of which collectively support the iterative evolution of work over time. 'Nurture' is used specifically for its positive and supportive connotation and its sense of encouraging the development of, here, autonomous revising. Emphasizing the *development* of autonomous revising reflects the finding that the process entails numerous skills that evolve independently and collectively. As evidenced by the ways in which writerly tool use nurtures autonomous revising, such skills include reading and evaluating written text, identifying what needs to be changed and potential solutions, and soliciting and incorporating feedback from others. Individualizing uses of writerly tools to encourage the growth of such skills directs attention to processes of reading and evaluating written text, as well as from whom (e.g. teachers, peers, and parents) and in what form (e.g. handwritten markings, tracked changes, or narrative responses in either format) one procures feedback from others.

As discussed (see Section 7.1.3), the experiences of revising are embodied and shaped by different uses of writerly tools. Reading typescript on a screen or on paper, handwritten text on paper, reading out loud from paper, and listening to the computer – all offer different visual,

[32] This dynamic underpins the drafting strategy advanced by Peter Elbow (1998). As an alternative to the traditional approach of outlining first, which seems to be favored by instruction, Elbow recommends beginning by freewriting in complete sentences. According to Elbow, freewriting leverages the capacity to construct meaning while writing.

tactile, and auditory experiences. To nurture autonomous revising, writers should consider which reading materials and practices enable optimal processing: comprehensive and accurate interpretation of the text's meaning and minimum excessive burden on the processes of evaluation. Revising by hand as opposed to with available digital editing tools, for example, offers different experiences. For those who seek feedback from others, the variety of swift and simple ways of communicating electronically and sharing and returning drafts via digital writerly tools offer other options. As writers contemplate their own autonomous revising practices, how those from whom they seek feedback use their writerly tools for revising also has consequences.

As indicated in the considerations discussed above, the challenges of integrating writerly tools for nurturing autonomous revising emerge through the assumptions that writers make when selecting their methods and practising the skills involved. One assumption is that writing surface does not affect comprehension. As has been discussed, this is not so. Individuals apply diverse behaviours and attitudes when reading from a screen as opposed to paper – with the material properties of each surface affording distinct navigation experiences and mental representations. Underpinning the processes of autonomous revising, the reading experience holds further ramifications for the evaluation of the text. This raises another assumption: the tools that one uses when autonomously revising a text do not alter the ways in which it is evaluated. This too is not a guarantee. Whether revising one's own work by hand, in a word-processing software, or receiving tracked-changes, the functions and constraints of the tools used in each scenario – along with routine ways of interacting with them – shape their use. For example, when revising one's own work on screen, one is more likely to make the change than to indicate what needs to be changed and how, before incorporating the solution. The process of reviewing a draft on screen, even when using Track Changes, chunks together information and decisions, eliciting intuitive responses and inducing contracted interactions.

How writerly thinking relates to uses of writing tools among both the student and professional writers (continual learning, embodiment, and individualization) indicates that writers will continue to pursue the frontiers of the writing experience. The future of thinking about writing and the craft's practice across devices is bright. Amidst the abundance of tools, multiple ways to conceptualize supporting the scope of thinking while writing emerge. Through their individualization, others will materialize. While the words of professional writers distil the

essence of writing – of thinking – the student writers illuminate the value and potential of composing across tools. Their collective experiences and processes will remain rich sources for insights into thinking while writing and the implications of writing tools. And what of the implications of these findings? How thinking about writerly tool use might be structured to realize the potential of technology for writing, and how thinking about writing might benefit from fresh perspectives, are proposed in the following chapter.

# Chapter 8: Conclusions

This chapter brings this study to its conclusion by considering the implications of the findings through the primary two fields that this thesis spans: learning and technology, and composition studies. Returning to this study's guiding queries outlined in Chapter 3, the chapter addresses 1) whether technology supports new writerly ways of thinking; 2) how composition theories might be supported or enhanced through this study's findings. Drawing on this study's theoretical underpinnings, as outlined in Section 2.5, along with the frameworks from Chapter 7 and the findings collectively, this chapter responds to those fundamental queries by theorizing the writing process in fresh ways, and through those views, writerly tool use. Section 8.1 conceptualizes ways to think about using the range of surfaces and implements available, to explore implications for how to incorporate digital writerly tools and ways of doing so. From those understandings, Section 8.2 introduces ways to think about writing that add to – while highlighting limitations in – existing theory. The outlined ways to think about writing seek to facilitate the continual and constructive incorporation of changes and developments to writerly tools. Together, the two sections offer insights into how people learn to write, and how they write, with reference to writerly tools; in addition to the pedagogical implications of how writers might be supported in their continual learning. By appreciating and integrating realities of the lived experience of writing, writerly tool use might be practised and studied in ways that directly support the deep and embodied thinking that constitutes writing. Section 8.3 brings this chapter, and thesis, to its conclusion with guidance and potential directions for future research.

## 8.1 Writing and Technology: Realizing the Potential through Inclusion

This section theorizes about using technology for writing by first examining the writing experience according to the range of surfaces and implements available. This approach reflects the finding that using technology does not result in new writerly ways of thinking and the related point that writerly thinking is not tool specific. Proposing that writers consider the full scope of tools, instead of focusing on technology, seeks to shift the emphasis to how – not which – tools are being used. From that basis, the second subsection explores potential implications for writers and the writing process, including ways in which writers might think about using technology for writing. Aligned with this study's adoption of pragmatic principles, this section extends this

study's theoretical contribution to consider new ways to practise thinking while writing with technology.

### 8.1.1 Theorizing about Writerly Tool Use

This section outlines the study's main theoretical contribution: writing tools do not change what constitutes thinking while writing, but how thinking for writing is practised. Writing entails certain ways of thinking that are practiced with the range of non-digital and digital tools for writing. How these tools are used shape and are shaped by ways of thinking while writing. After discussing the findings on what is thinking while writing, the section cites insights into how tools alter the practice of ways of thinking for writing.

As will be elaborated upon in Section 8.2, this thesis contributes to existing theory a view of writing that distils the thinking and knowledge upon which models traditionally adopted by writing research depend, but tend to neglect. This view reflects this study's findings from the lived experiences of a range of writers, at different developmental levels. Underpinning these findings is the view of writing as thinking, and that related research could profitably develop understandings through the lived experience of writing, which is processed and made sense of through the mind of the writer. As elaborated upon throughout Section 2.5 and Chapter 4, this framing shaped what data were sought, and how they were collected and analysed. From this framework and its application, the resulting findings indicate that writerly ways of thinking are not determined by whether a surface or implement is digital or non-digital. Writers of diverse backgrounds use the full range of surfaces and implements for the scope of ways of thinking while writing. Those ways of thinking continue to include a range of syntactic, semantic, and rhetorical decisions and to wrestle with issues of tone, style, and voice. Such crafting of substance – and its reception – still requires the synchronization of attention, memory, language, and motor activity. These ways of thinking, which require sophisticated knowledge of writing mechanics, occur across the range of writing tools. *What* constitutes thinking while writing, therefore, is not changed by the nature of tools being used. Technology, according to this study, is not leading to new ways of thinking while writing. Writing tools do, however, change *how* thinking while writing is practised.

Digital devices offer different features and ways of interacting that both change and allow writers to change how such thinking proceeds. For example, selecting a word when writing with a pencil and paper might involve, *ad minimum*, developing a sense for what one intends to say,

generating words from long-term vocabulary knowledge, and auditioning the recalled words in context until a match is identified. By contrast, when using digital devices, dictionaries, and thesauruses embedded within word-processing software supply words as visual stimuli. Digital devices do not obviate choosing words; they offer features that change how writers might retrieve words. How thinking while writing is practised in one situation may, however, have implications beyond that immediate instance. The consequences of technology for writing are real. Arguing that digital devices do not result in new thinking is not to diminish their significance or potential. This notion will be elaborated upon in Section 8.1.2.

This distinction between the thinking while writing – the *what* – and the ways in which it is practised – the *how* – clarifies the scope of influence of writing tools. This finding also reveals why dividing thinking about writerly tool use according to digital and non-digital tools would weaken the subsequent reasoning. Such an approach presupposes that that binary is the distinguishing factor in how the thinking occurs. Not only do the findings from this study refute that, they confirm and substantiate what the literature review proposes: a range of environmental and biological factors, and technology trends, shape writerly tool use. In particular, the findings reveal how surfaces, implements, and writing software continue to be designed to simplify the writing experience, while increasingly constituent of devices developed and used for purposes other than writing. These trends – designing to simplify use while increasing multi-functionality – guide changes to writing tools. Thinking about writerly tool use ought to continue examining these trends and the number and diversity of elements involved. The emphasis of existing work on writing and technology on how relationships among external elements shape a written outcome, however, is misguided. While acknowledging the complexity, that focus dislocates thinking about using writing tools from what matters.

Instead, thinking about writerly tool use should be oriented, or re-oriented, with direct reference to the thinking while writing. Specifically, uses of writerly tools might be conceptualized and assessed according to whether they constructively mediate the thinking while writing. According to this study, certain elements are essential to understanding and evaluating those dynamics, encompassing:

- writers' biographies, including their mental, physical, and sensory abilities, and their knowledge and orientations through which they practise and make meaning from their writing experiences;

- conditions of the immediate writing environment, including the text being written;
- spatial and temporal elements perceived while writing;
- the hardware and software of the surfaces and implements.

Thinking about writerly tool use must account for these elements. Appreciating the variety of characteristics distinguishing these elements illuminates the varied constructions through which writerly thinking might be mediated.

Through these essential elements, the constructive mediation of thinking while writing occurs primarily in two ways: by supporting the thinking and by mitigating hindrances to the thinking. Distinguishing these processes guides thinking about tool use to identify precisely and accurately how best to mediate thinking while writing. Regarding the first approach, the sense of 'support' must never be substituted for with that of 'replace'. Not a single element involved in writerly tool use renders writerly thinking unnecessary. On the contrary, the proposed orientation charges writers to remain critical of whether the ways in which they use their tools ever impair their thinking while writing. Whether stifling, diluting, or undermining the writerly thinking, crutches and deterrents are not uncommon.

This is why, in addition to ways that support the writerly thinking, theorizing writerly tool use should consider ways that minimize or dissolve barriers to the thinking while writing. The potential of orienting uses of tools accordingly is highlighted by research into group brainstorming. Research into group brainstorming (DeRosa et al., 2007) is developing understandings of how different formats shape how multiple, individual factors mediate ideation – with others – by identifying procedural and social psychological factors that theoretically hinder face-to-face brainstorming. Through that approach, asynchronous electronic brainstorming has been identified as a more productive and creative process, generating more unique and relevant ideas (Michinov & Primois, 2005). This area of work reveals how factors that hinder thinking in given situations might be mitigated through certain interfaces and temporal sequencing – and hints at the potential of thinking about writerly tool use through inclusion.

### 8.1.2 Theorizing Technology for Writing

Drawing on the theoretical argument outlined above, this section explores how to think about using technology for thinking for writing. In focusing on the conceptual implications, the discussion initially offers how to frame ways of thinking about using technology for writing.

Through this framing, ways of thinking about using technology for writing are explored. As discussed, to date efforts to theorize about how to support writing with technology have made assumptions regarding the dynamics occurring without technology, and the implications of integrating technology.[33] Proposing how technology might support thinking while writing, as introduced in Chapter 2, Pea and Kurland (1987) outline the development of tools and software according to the cognitive processing model. Constrained within the categories of planning, translating, reviewing, and monitoring, the researchers' suggestions are underpinned by their efforts to promote collaboration, to minimize demands on writers' memories, and to accelerate transcription speed. Section 8.2 will address theoretical and methodological implications of the view of composing upheld by writing research and literature. Here the point is that nearly three decades later, the objectives presented in Pea and Kurland's work prevail. Such aims, in theory, reflect persistent challenges to composing: developing and refining ideas, having access to and remaining conscious of relevant information, and simply getting words 'down'. As the findings illustrate, uses of technology certainly offer ways to facilitate elements of the writing process and, as Section 8.1.1 explained, constructive ways to mediate the thinking involved. Technology does not, however, select the words or do the thinking. Writers still must write, whether constructing and defending clear and informed theses or crafting and creating narratives. This raises a fundamental principle to maximize the potential benefits of technology for writing: writing continues to be a process of the mind, body and senses – requiring focus, precision, and effort.

This principle and the approach to theorizing about writerly tool use, outlined above, make it possible to formulate three points that frame ways to think about technology for writing. First, existing literature on how to integrate technology has not precisely identified the obstacles that challenge writers in ways that might be addressed or supported by technology. Second, the professional and student writers from this study, ultimately, struggle with getting words onto

[33] Similar assumptions are evident in efforts to support learning and studying with technology. Brown et al. (2014) discuss how empirical research has recently demonstrated that effective strategies for learning are effortful, iterative, interleaved, and inter-spaced retrieval; yet, among college students, the most used study strategies are highlighting, underlining, and multiple re-readings in short periods of time. Over the years, the majority of online applications for reading and organizing PDFs, and programmes aiming to promote critical thinking (e.g. ThinkCERCA), have simply incorporated digitized versions of popular strategies (e.g. highlighting) instead of questioning and researching the dynamics occurring.

their surfaces that are worth keeping,[34] and with sculpting those words into clear, substantive, and cohesive writing. Third, these challenges are inherently internal though mediated by a variety of factors. From this conceptual grounding, ways to think about technology for writing can be articulated as follows:

1. *Minimize environmental and internal clutter:* The portability of devices allows writers to work within their settings of choice. Further, through their devices writers may interact with technology in ways that address individual cognitive (e.g. memory), physiological (e.g. posture), and emotional (e.g. loneliness) obstacles mediating the production of text.
2. *Facilitate and sustain transcription through tactile and visual anticipation and feedback:* Writers in this study indicate that the interactive experience of writing with digital devices is proleptic – the tactile feedback, the flashing cursor, and the consistent representations anticipate and elicit word thoughts onto the screen. Using technology, particularly when writers concede their self-awareness and their thoughts *about* writing, tends to engage productive writerly states – described by one participant in this study as 'magic'.
3. *Filter and evaluate writerly thinking:* The ease of inserting, deleting, and manipulating text and printing a page of sterile typescript renders technology invaluable for writers to filter and to evaluate inner thinking. Moreover, such reflective engagement empowers writers with deeper understandings of their own processes of production and supports the development of their capacities for manipulating text at the thought level.
4. *Support the internal and external concatenation of prose – over time and between spaces:* With documents accessible across devices, technology makes it easier to manipulate and to revisit text over time through a range of material interfaces. Further, working across different hardware and software offers new ways and perspectives through which to internalize content and to construct ideas.

Before proceeding to the following section, one point of emphasis is offered here, in particular for student writers and avid technology users. Research continues to find that younger

[34] Though the generation and crafting of ideas, as referred to in the prior section, is one example of this, the proposed use of technology – for collaboration – distorts the individual originality to which writing aspires.

people multi-task (e.g. listen to music while working) and switch between tasks on their digital devices more frequently than older generations (Zhang et al., 2015). However, younger generations continue to struggle with the difficult task combinations that challenge older generations (Carrier et al., 2009). This suggests that basic cognitive limitations restrict multi-tasking and task-switching abilities across generations. Further, those less inclined to engage in analytical thinking, as opposed to intuitive thinking, are more likely to displace effort onto their technology (Barr et al., 2015). Meanwhile, technology offers potentially endless distractions, and increasingly reduces the effort required to complete most tasks (Carr, 2014). In contrast, writing with technology requires significant effort and sustained focus. As the student writers in this study illustrate, their uses of technology for writing are moulded through their educational experiences and understandings, as well as through their general digital behaviours. This exemplifies why educational experiences must equip students with the knowledge to realize the ways in which writers might think about integrating technology outlined above. Leveraging students' frequent text-based communications as an opportunity to discuss explicitly differences between genres, Jacobs (2008) offers one approach. In turn, student writers ought to embrace the effortful development of writerly knowledge – which technology does not obviate – and to practise writerly thinking with purpose when using their technology for writing.

## 8.2 Conceptualizing the writing process in fresh ways

Traditionally, writing research distinguishes between writing as a process, writing as genre and writing as product (Tolchinsky, 2006). From these views, different models emerge. Researchers (Pritchard & Honeycutt, 2006) highlight how the process model frames the purpose of the writing process in unrealistically limited ways that constrain understanding, while making assumptions about writers' knowledge that carry significant pedagogical implications. Further, this thesis finds, as discussed, that definitions of the writing process and its constitutive processes vary in practice, while the basic theoretical definition continues to evolve in the literature. Grounding writing in its concrete forms and notations, notions of writing as product (Badger & White, 2000) are concerned with the structure of language and see the development of writing as processes of imitation. While highlighting important building blocks, this approach to writing emphasizes writerly knowledge over what underpins its development and application, including the integral role of context. Unlike understandings of writing as product and process, writing as genre does acknowledge variation in writing according to context (Badger & White, 2000). Yet,

contextual influence is primarily seen to be social. Even still, notions of writing as genre (Tolchinsky, 2006) require writerly thinking to be realized. Thus, such a view of writing seems, ultimately, to operate at a certain conceptual distance from an understanding of writing as thinking. Throughout writing research and theory, an emphasis on fitting writing into a model with common understandings of common task-oriented processes has prioritized language used to discuss and to develop writing, instead of what constitutes writing.

As illustrated by Pea and Kurland's work (referenced above), writing theory – and, in that instance, the cognitive process model – has the potential to hinder and to constrain understandings and uses of writing tools. Facilitating a more inclusive incorporation of changes to surfaces, and implements, and writing software, would benefit from fresh ways of thinking about writing. As Chapter 7 explains, writing might be understood as involving continuous learning, individualized writerly activity, and ways of thinking, underpinned by sophisticated knowledge of written language. Offering fresh ways to think about writing, this thesis argues and illuminates how the essence of writing is ways of thinking that are, at times, embodied. This notion substantiates understandings and ways of thinking about the development and lived realization of processes and discourses, by clarifying the foundation and knowledge from which they operate.

Drawing on the thesis's findings, this chapter continues by explaining why and how thinking about writing according to writerly thinking and its embodiment will continue to benefit from developments in writing tools. Discussing writerly thinking and the embodiment of writing separately is not to imply that they operate independently of one another. Rather, the lived experience of writing is realized through their dynamic synchronization. Before proceeding, it must be emphasized that the subsequent theorizing reflects this thesis' truly interdisciplinary approach and initial view of writing as thinking. As individuals increasingly write in diverse spaces and times, with distinct tools and contextual influences, researching their thinking for writing will benefit from ways of thinking about writing that allow for the continual evolution, individuality and embodiment of writing.

### 8.2.1 Writerly Thinking

As noted, beyond debates about writing as a process and writing as genre, traditional cognitive and social theories about writing model writing according to elements of an individual's cognition (e.g. long-term memory), the roles of resources and their components (e.g.

working memory and the central executive) and writing processes (e.g. planning and editing). These models and frameworks continue to guide research but empirical evidence in support of their hypotheses remains mixed (Hayes, 2008). Still, categorizing what occurs to generate a bold model continues to be a key objective of writing research. Further, those models continue to give structure to writing instruction – to thinking and talk about the development of writing skills. The student writers in this study, for example, had taken and adapted prescriptive writing frameworks (e.g. the five-paragraph essay) and strategies (e.g. outline first) oriented to the written outcome. Through those formal concepts, the students have developed their own writing practices and understandings of writing. Supposed efforts to reconceptualize the nature of writing instruction according to a model of writing as a cognitive and expressive process, as espoused by the Dartmouth Seminar, have not translated into new ways of learning writing.

Over time, the students in this study clearly have developed their own views on what they *should* do while writing. A number of students noted, for example, that they know they *should* outline. Such references, however, were often shared before conceding that the process is not always incorporated. Repeated comments about not always doing what they should do illuminated how the students take frameworks from their instruction, but struggle to understand whether and how to apply them. Those struggles reflect a tension among 1) what they have taken from how they have been taught to write, 2) how they think they should write, and 3) how they actually practise writing. Such tension appears to be aggravated by the absence of clear, accurate and cohesive explanations of what writing is, how one learns to write, and how writing might be taught.

This conceptual confusion underpinning writing experiences appears to be compounded by the integration of technology. Technology both raises uncertainty related to decisions being made and automates decisions so that the uncertainty is not addressed. Even formal instruction does not explicitly address how to use technology for writing – let alone thinking while writing. Both the student and professional writers – as discussed – reconciled this uncertainty by developing their uses of digital devices on their own – according to their own individual behaviours and environments. Among the students, uses of digital tools evolved through the continual practice and adaptation of their general technology behaviours and knowledge, according to fragmented understandings of writing. Using technology for writing in that way, risks being undermined by non-writerly digital behaviours. As indicated in Section 8.1.2,

intuitive personalization does offer insights into how to think about constructively incorporating digital devices. However, distinguishing and applying those insights requires knowledge of writerly thinking and the ability to discern accurately how technology mediates one's thinking while writing.

Current thinking about writing is misconceived and does not explain how to incorporate changes and developments to writing tools. Existing understandings and thinking about writing operate at a conceptual distance from writerly ways of thinking. They do not account for individual variation and for how thinking while writing may be practised in different ways with different tools. Instead, understandings of writing continue to emphasize proposed theories, theoretical tasks involved in composing, and the development of a written outcome. At the same time, basic dynamics – such as how writerly tool use relates to writerly thinking – are not well understood. Crossing disciplines, this study reveals that writerly thinking is a clear and comprehensive way to think about what constitutes writing and its relationship to writerly tool use. Thinking about writing as an experience involving the practice of writerly thinking clarifies the difference between thinking while writing and how that thinking is practised. Writerly thinking provides a clear focus for the development of thinking while writing, independent of the tools being used, but would continue to guide their constructive integration. Further, the continued application of a neuro-anthropological orientation would ensure the theoretical cohesion of insights over time into how writing tools change how thinking while writing is practised.

### 8.2.2 Embodiment of Writing

In addition to the utility of writerly thinking, this study has revealed how the lived experience of writing is embodied. With reference to this study's findings, the embodiment of writing refers to the experience of the action and perception that mediates the materiality of surfaces and implements, a writer's immediate conditions, and relevant spatial and temporal factors. Composition research and writing instruction have yet to integrate this perceptual and physical activity (except, arguably, for the development of handwriting skills), let alone in explicit and constructive ways for thinking while writing. While research and literature on the digitization and haptics of writing investigates perception and fine motor activity, they do not consider the implications for writerly thinking. Instead, action and perception are studied as dynamics changed by digital devices, without being recognized as fundamental to writing

behaviours and experiences across devices. Nonetheless, isolated efforts to understand how activity and perception relate to thinking while writing, including work on the phenomenology of writing (Chandler, 1992) and mobility while composing (Ehret & Hollett, 2013) offer hope.

Thinking about writing as embodied is particularly important as changes to writing tools alter the experience of writing and the use of written language proliferates. The reasons for this are two-fold. First, while writing is theorized as an exclusively cognitive process, the embodiment of writing continues not to receive sufficient attention. Meanwhile, as this study has illustrated, the physical and perceptual activity of writing is increasingly different and varied. Research suggests that these dynamics have implications for how thinking while writing proceeds, but those implications are not well understood and are not being rigorously examined. Second, changes to writing tools render the embodiment of writing increasingly complex and ambiguous, particularly for individuals who frequently use those tools for non-writerly, text-based activities. Owing to their multi-functionality, connectedness, and the portability of digital devices, many of the spatial and temporal divisions that once gave order to social communications and the writing experience are dissolving. Within these fluid experiences, non-digital tools are being integrated in ways that magnify the differences and reveal the promise in inclusive, embodied understandings.

Though the implications for thinking while writing remain unclear, the findings from this study reveal instances when different tools used for the same task engender different experiences. Crossing out items in a list offers a striking example of how the embodied experience of a task – the perception and resulting satisfaction – changes as a result of the tools being used. Whether using a pencil on paper or a stylus on an iPad, or applying a digital strike-through effect to typescript on a screen, each way of crossing out text offers a noticeably different haptic and perceptual experience with distinct connotations for different individuals. Putting a line through text may seem trivial. However, the example illustrates how embodied experiences that differ from expectations pique writers' attentions and shape their recollection of the task. Pre-existing expectations are often informed by prior uses of different surfaces and implements for the same task. The absence of expected cues or the perception of unexpected stimuli interferes with how a task is remembered. Researchers that think about writing as embodied might illuminate how the activity and perception of using new tools shapes task performance.

In addition to how the embodiment of tool use shapes expectations and thinking while writing, developing understandings of physiological states and their role in writing is integral to leveraging developments in writing tools. A writer may prefer to write lying down owing to experiences of being productive in the posture or to the emotional implications of the spaces where one tends to lie down. Supportive spaces, however, do not guarantee productivity. Further, there is a distinction to be made between whether the factor contributes directly or indirectly to the thinking while writing. Indirect reasoning may distract students trying to leverage the embodiment of writing, which is already complicated by intersecting and overlapping social and academic worlds, online and offline. When managing conversations and essays on the same screen and across devices, the spatial and temporal distance between social and academic work – literally and conceptually – dissipates. Such conditions challenge efforts to create divisions and to maintain clarity of thought. While evidently socializing across devices, the students also seem to personify their technology. Basic goals underlying social cognitions (Gehlbach & Brinkworth, 2008) drive how many of the students frequently interact with their devices: they use them to understand themselves and others, to enhance their sense of self, and to be efficient. Rarely, however, are the goals of writerly cognitions those of social cognitions.

The embodiment of writing should, therefore, be included within ways of thinking about writing so that conceptualizations of writing reflect the entirety of the lived experience. From that theoretical foundation, the implications of using writing tools for thinking while writing might continue to be examined in ways that appreciate the complex physicality of writing and explore its pedagogic potential. Further, the development of explicit guidance for student writers would continue to inform and to address their experiences in precise and realistic ways that account for changes in their environments. As writing tools develop, attention to the embodiment of writing and how it interacts with writerly thinking will direct writers to assess the range of corresponding implications and their benefits for writerly thinking.

## 8.3 Concluding Thoughts

The study presented in this thesis sought to begin to develop understandings of how different uses of available tools relate to thinking for writing. Its findings reflect exploratory enquiries and endeavour to provide descriptive insights. Whether and, if so, how they might offer value to writers has been a sincere concern throughout the execution and writing of this thesis – hence, the attention devoted to explicit suggestions for how to think about and to make use of surfaces

and implements. Even so, qualitative research remains difficult to digest. With that in mind, key points from this study are distilled here.

Digital devices continue to be integrated while the underlying assumptions and implications for thinking while writing go unquestioned. They are not being conceptualized with reference to other tools, let alone complete understandings of writing. As this thesis finds, this suggests that the potential of technology for writing has yet to be explained, and that its realization remains obstructed. Such challenges persist in part owing to a lack of understanding and clear explanation, which are compounded by the evolution of writing devices and practices, and the contexts in which they occur. Both reflective experimentation and further research might better inform writing development, practice and tool use. Specifically, research might examine:

1. the practice and development of individualized and embodied thinking while writing;
2. which writing tools benefit which individuals, when and why;
3. how technology might directly support thinking while writing and, through individual tasks, the writing process as a whole;
4. how contexts – space, time, relations and information – might be managed and processed in ways that benefit writing.

This research agenda reflects ways of thinking about writing that might also enhance writing instruction. Integrating such views within writing instruction might shift its purpose in ways that directly benefit and support the lived experience of writing. This is critical to ensuring that writerly thinking is able, for example, fluidly to select and to question the relevance of a word at one moment and how a clause communicates an observation and provides evidence for an argument at the next moment. Dynamic interactions with words and ideas, deliberating upon their necessity and construction, will continue to underpin thinking while writing. How such thinking might be practised remains within writers' powers – either to control or to be supported. Owing to the increasing automation characterizing digital devices, writing instructors – and writers – ought to be ever purposeful about nurturing and refining the ways of thinking that constitute writing.

Throughout educational and professional environments, technology increasingly is used to write and to share written work. Paperless offices and even classrooms are realities. Technology continues to be touted as a solution to developing writing skills while how it might be used to do so remains unclear. For all writers, technology may be here to stay, but use of pens,

pencils, and paper are likely to endure for some time. Different surfaces and implements offer different benefits for different individuals at different stages while composing. There is not a single way to write and there is no magical tool for writing – other than the mind of the writer. While not engendering new ways of thinking for writing, technology offers powerful opportunities for how writers might practise their craft. Discovering those opportunities can be an active journey for all writers. The quality of their crafting, however, will continue to depend on their ways of thinking for writing.

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## Appendix 1: Interviews from the *Paris Review*

A single asterisk (*) indicates that the writer's use of implements and surfaces was not discussed within the interview and two asterisks (**) indicate that the writer being interviewed did not discuss writing implements or surfaces despite explicit questioning about their writing habits – ways of working.

***The Art of Non-fiction***

1. Joan Didion interviewed by Hilton Als, Spring 2006
2. Gay Talese interviewed by Katie Roiphe, 2009
3. John McPhee interviewed by Peter Hessler, Spring 2010
4. Janet Malcolm interviewed by Katie Roiphe, Spring 2011
5. Emmanuel Carrère interviewed by Susannah Hunnewell, Fall 2013
6. Geoff Dyer interviewed by Matthew Specktor, 2013
7. Adam Phillips interviewed by Paul Holdengräber, Spring 2014

***The Art of Fiction***

1. E. M. Forster interviewed by P. N. Furbank & F. J. H. Haskell, Spring 1953
2. François Mauriac interviewed by Jean Le Marchand, Summer 1953
3. Graham Greene interviewed by Simon Raven & Martin Shuttleworth, Autumn 1953
4. Irwin Shaw interviewed by George Plimpton & John Phillips, Winter 1953
4. Irwin Shaw interviewed by Lucas Matthiessen, Willie Morris, John Marquand, Spring 1979*
5. William Styron interviewed by Peter Matthiessen & George Plimpton, Spring 1953
6. Alberto Moravia interviewed by Anna Maria de Dominicis & Ben Johnson, Summer 1953
7. Joyce Cary interviewed by John Burrows & Alex Hamilton, Fall-Winter 1954-1955
8. Ralph Ellison interviewed by Alfred Chester & Vilma Howard, 1953*
9. Georges Simenon interviewed by Carvel Collins, 1953
10. James Thurber interviewed by George Plimpton & Max Steele, Fall 1955
11. Nelson Algren interviewed by Alston Anderson & Terry Southern, 1953
12. William Faulkner interviewed by Jean Stein, Spring 1956
13. Dorothy Parker interviewed by Marion Capron, Summer 1956
14. Isak Dinesen interviewed by Eugene Walter, Autumn 1956*

15. Françoise Sagan interviewed by Blair Fuller & Robert B. Silvers, 1956

16. Thornton Wilder interviewed by Richard H. Goldstone, Winter 1956*

17. Truman Capote interviewed by Pati Hill, Spring 1957

18. Robert Penn Warren interviewed by Eugene Walter & Ralph Ellison, Spring–Summer 1957*

19. Frank O'Connor interviewed by Anthony Whittier, Autumn–Winter 1957

20. Angus Wilson interviewed by Michael Millgate, Autumn–Winter 1957

21. Ernest Hemingway interviewed by George Plimpton, Spring 1958

22. Henry Green interviewed by Terry Southern, Summer 1958

22. James Jones interviewed by Nelson Aldrich, Autumn–Winter 1958 – 1959

23. Lawrence Durrell interviewed by Gene Andrewski & Julian Mitchell, Autumn–Winter 1959 – 1960

24. Aldous Huxley interviewed by Raymond Fraser, George Wickes, Spring 1960

25. Boris Pasternak interviewed by Olga Carlisle, Summer–Fall 1960

26. Ilya Ehrenburg interviewed by Olga Carlisle, Summer–Fall 1961*

27. Mary McCarthy interviewed by Elisabeth Sifton, Winter–Spring 1962

28. Henry Miller interviewed by George Wickes, Summer–Fall 1962

29. Katherine Anne Porter interviewed by Barbara Thompson Davis, Winter–Spring 1963

30. Evelyn Waugh interviewed by Julian Jebb, Summer–Fall 1963

31. S. J. Perelman interviewed by William Cole & George Plimpton, Summer–Fall 1963

32. Norman Mailer interviewed by Steven Marcus, Winter/Spring 1964

33. Louis-Ferdinand interviewed by Céline Jacques Darribehaude & Jean Geunot, Winter–Spring 1964*

34. Jean Cocteau interviewed by William Fifield, Summer–Fall 1964

35. Simone de Beauvoir interviewed by Madeleine Gobeil, 1965

36. William S. Burroughs interviewed by Conrad Knickerbocker, Fall 1965

37. Saul Bellow interviewed by Gordon Lloyd Harper, Winter 1966

38. Blaise Cendrars interviewed by Michel Manoll, Spring 1966*

39. Jorge Luis Borges interviewed by Ronald Christ, Winter–Spring 1967

40. Vladimir Nabokov interviewed by Herbert Gold, Fall 1967

41. Jack Kerouac interviewed by Ted Berrigan, Summer 1968

42. Isaac Bashevis Singer interviewed by Harold Flender, Fall 1968

43. John Updike interviewed by Charles Thomas Samuels, Winter 1968*

44. John Dos Passos interviewed by David Sanders, Spring 1969

46. Jerzy Kosinsk interviewed by George Plimpton & Rocco Landesman, 1972

47. Eudora Welty interviewed by Linda Kuehl, 1973

48. Anthony Burgess interviewed by John Cullinan, Spring 1973

49. Christopher Isherwood interviewed by W.I. Scobie, 1974

50 Gore Vidal interviewed by Gerald Clarke, 1974

51. Joseph Heller interviewed by George Plimpton, 1974

52. Bernard Malamud interviewed by Daniel Stern, Spring 1975*

53. J. P. Donleavy interviewed by Molly McKaughan & Fayette Hickox, 1975

59. Kinglsey Amis interviewed by Michael Barber, 1975

60. P. G. Wodehouse interviewed by Gerald Clarke, 1975

61. Stanley Elkin interviewed by Thomas LeClair, Summer 1976

62. Erskine Caldwell interviewed by Elizabeth Pell Broadwell, Ronald Wesley Hoag, Winter 1982

62. John Cheever interviewed by Annette Grant, Fall 1976

63. P. L. Travers interviewed by Edwina Burness, Jerry Griswold, Winter 1982

63. William Goyen interviewed by Robert Phillips, Winter 1976

64. Kurt Vonnegut interviewed by David Hayman, David Michaelis, George Plimpton, Richard Rhodes, Spring 1977

65. Rebecca West interviewed by Marina Warner, Spring 1981

65. William Gass interviewed by Thomas LeClair, Summer 1977

66. Donald Barthelme interviewed by J.D. O'Hara, Summer 1981*

66. Marguerite Young interviewed by Charles E. Ruas, Fall 1977

67. Jessamyn West interviewed by Carolyn Doty, Fall 1977

67. Paul Bowles interviewed by Jeffrey Bailey, Fall 1981

68. Anthony Powell interviewed by Michael Barber, Spring–Summer 1978

68. Carlos Fuentes interviewed by Alfred Mac Adam, Charles E. Ruas, Winter 1981

69. Gabriel Garcia Marquez interviewed by Peter H. Stone, Winter 1981

69. James M. Cain interviewed by David Zinsser, Spring–Summer 1978

70. Czeslaw Milosz interviewed by Robert Faggen, Winter 1994

70. Malcolm Cowley interviewed by John McCall, Fall 1982

70. Margaret Drabble interviewed by Barbara Milton, Fall-Winter 1978

71. Joan Didion interviewed by Linda Kuehl, Winter 1978

71. William Maxwell interviewed by John Seabrook, Fall 1982

72. Joyce Carol Oates interviewed by Robert Phillips, Fall-Winter 1978

73. John Gardner interviewed by Paul F. Ferguson, John R. Maier, Sara Matthiessen, Frank McConnell, Spring 1979

74. Heinrich Böll interviewed by Leslie Willson, Spring 1983

75. Guillermo Cabrera Infante interviewed by Alfred Mac Adam, Spring 1983

76. Raymond Carver interviewed by Mona Simpson, Lewis Buzbee, Summer 1983

77. Nadine Gordimer interviewed by Jannika Hurwitt, Summer 1983*

78. James Baldwin interviewed by Jordan Elgrably, Spring 1984

79. Elie Wiesel interviewed by John S. Friedman, Spring 1984*

79. John Steinbeck (continued) interviewed by George Plimpton & Frank Crowther, Spring 1975

80. Arthur Koestler interviewed by Duncan Fallowell, Summer 1984*

81. Milan Kundera interviewed by Christian Salmon, Summer 1984

82. Edna O'Brien interviewed by Shusha Guppy, Summer 1984

83. Julio Cortazar interviewed by Jason Weiss, Fall 1984**

83. Nathalie Sarraute interviewed by Shusha Guppy, Jason Weiss, Fall 1990

84. Philip Roth interviewed by Hermione Lee, Winter 1984

85. J. G. Ballard interviewed by Thomas Frick, Winter 1984

86. John Barth interviewed by George Plimpton, Spring 1985

87. Elizabeth Hardwick interviewed by Darryl Pinckney, Summer 1985

88. Rosamond Lehmann interviewed by Shusha Guppy, Summer 1985

89. Thomas McGuane interviewed by Sinda Gregory, Larry McCaffery, Fall 1985

90. Robert Stone interviewed by William C. Woods, 1985

91. Alain Robbe-Grillet interviewed by Shusha Guppy, Spring 1986*

92. John Hersey interviewed by Jonathan Dee, Summer/Fall 1986

93. John Irving interviewed by Ron Hanson, Summer/Fall 1986

94. E. L. Doctorow interviewed by George Plimpton, Winter 1986

95. Cynthia Ozick interviewed by Tom Teicholz, Spring 1987

96. Francine du Plessix Gray interviewed by Regina Weinreich, Summer 1987

97. Walker Percy interviewed by Zoltán Abádi-Nagy, Summer 1987

98. Anita Brookner interviewed by Shusha Guppy, Fall 1987

99. Peter Taylor interviewed by Barbara Thompson Davis, Fall 1987**

100. Hortense Calisher interviewed by Allan Gurganus, Pamela McCorduck, Mona Simpson, Winter 1987

101. William Gaddis interviewed by Zoltán Abádi-Nagy, Winter 1987
102. Doris Lessing interviewed by Thomas Frick, Spring 1988**
103. Marguerite Yourcenar interviewed by Shusha Guppy, Spring 1988*
104. Jim Harrison interviewed by Jim Fergus, Summer 1988
105. Edmund White interviewed by Jordan Elgrably, Fall 1988
106. John Mortimer interviewed by Rosemary Herbert, Winter 1988
107. Robertson Davies interviewed by Elisabeth Sifton, Spring 1989
108. William Trevor interviewed by Mira Stout, Spring 1989
109. John Fowles interviewed by James R. Baker, Summer 1989**
110. Elizabeth Spencer interviewed by Robert Phillips, Summer 1989
111. William Kennedy interviewed by Douglas R. Allen, Mona Simpson, Winter 1989
112. Josef Skvorecky interviewed by John Glusman, Winter 1989*
113. Max Frisch interviewed by Jodi Daynard, Winter 1989*
114. Manuel Puig interviewed by Kathleen Wheaton, Winter 1989
116. Mary Lee Settle interviewed by John Kenny Crane, Spring 1990
117. Iris Murdoch interviewed by Jeffrey Meyers, Summer 1990
118. Wallace Stegner interviewed by James R. Hepworth, Summer 1990
119. Maya Angelou interviewed by George Plimpton, Fall 1990
120. Mario Vargas Llosa interviewed by Susannah Hunnewell, Ricardo Augusto Setti, Fall 1990
121. Margaret Atwood interviewed by Mary Morris, Winter 1990
122. V. S. Prichett interviewed by Shusha Guppy, Anthony Weller, Winter 1990
123. Tom Wolfe interviewed by George Plimpton, Spring 1991
124. Günter Grass interviewed by Elizabeth Gaffney, Summer 1991
125. Wright Morris interviewed by Olga Carlisle, Jody Ireland, Fall 1991
126. Harold Brodkey interviewed by James Linville, Winter 1991
127. Reynolds Price interviewed by Frederick Busch, Winter 1991
128. Claude Simon interviewed by Alexandra Eyle, Spring 1992
129. Naguib Mahfouz interviewed by Charlotte El Shabrawy, Summer 1992
130. Italo Calvino interviewed by William Weaver, Fall 1992
131. Grace Paley interviewed by Jonathan Dee, Barbara Jones, Larissa MacFarquhar, Fall 1992
132. Mark Helprin interviewed by James Linville, Spring 1993
133. James Salter interviewed by Edward Hirsch, Summer 1993

134. Toni Morrison interviewed by Elissa Schappell, with additional material from Claudia Brodsky Lacour, Fall 1993

135. Don DeLillo interviewed by Adam Begley, Fall 1993

136. Ken Kesey interviewed by Robert Faggen, Spring 1994*

137. Alice Munro interviewed by Jeanne McCulloch, Mona Simpson, Summer 1994

138. Louis Auchincloss interviewed by George Plimpton, Fall 1994*

139. Chinua Achebe interviewed by Jerome Brooks, Winter 1994

140. Primo Levi interviewed by Gabriel Motola, Spring 1995

141. P. D. James interviewed by Shusha Guppy, Summer 1995

142. Patrick O'Brian interviewed by Stephen Becker, Summer 1995

143. Susan Sontag interviewed by Edward Hirsch, Winter 1995

144. Richard Price interviewed by James Linville, Spring 1996

145. Camilo José Cela interviewed by Valerie Miles, Summer 1996

146. William F. Buckley Jr. interviewed by Sam Vaughan, Summer 1996

147. Richard Ford interviewed by Bonnie Lyons, 1996**

148. Amos Oz interviewed by Shusha Guppy, Fall 1996

149. John le Carré interviewed by George Plimpton, Summer 1997

150. Jeanette Winterson interviewed by Audrey Bilger, Winter 1997

151. Martin Amis interviewed by Francesca Riviere, Spring 1998

152. Russell Banks interviewed by Robert Faggen, Summer 1998

153. Ismail Kadaré interviewed by Shusha Guppy, Summer 1998

154. V. S. Naipaul interviewed by Jonathan Rosen, Tarun Tejpal, 1998

155. Jose Saramago interviewed by Donzelina Barroso, Winter 1998

156. William Styron interviewed by George Plimpton, Spring 1999**

157. Peter Matthiessen interviewed by Howard Norman, Spring 1999*

158. Shelby Foote interviewed by Carter Coleman, Donald Faulkner, William Kennedy, 1999

159. Tahar Ben Jelloun interviewed by Shusha Guppy, Fall 1999

160. Mavis Gallant interviewed by Daphne Kalotay, Winter 1999

161. T. Coraghessan Boyle interviewed by Elizabeth E. Adams, Summer 2000

162. Gustaw Herling interviewed by Kelly Zinkowski, Fall 2000

163. William T. Vollmann interviewed by Madison Smartt Bell, 2000

164. Beryl Bainbridge interviewed by Shusha Guppy, Winter 2000

165. Julian Barnes interviewed by Shusha Guppy, Winter 2000

166. Rick Moody interviewed by David Ryan, Spring – Summer 2001
167. Lorrie Moore interviewed by Elizabeth Gaffney, Spring – Summer 2001
168. A. S. Byatt interviewed by Philip Hensher, Fall 2001
169. Budd Schulberg interviewed by Kurt Vonnegut, Winter 2001
170. Luisa Valenzuela interviewed by Sarah Lee, Ksenija Bilbija, Winter 2001
171. John Edgar Wideman interviewed by Steven Beeber, Spring 2002
172. Louis Begley interviewed by James Atlas, Summer 2002
173. Ian McEwan interviewed by Adam Begley, Summer 2002
174. Guy Davenport interviewed by John Jeremiah Sullivan, Fall 2002
175. Richard Powers interviewed by Kevin Berger, Winter 2002 – 2003
176. Amy Hempel interviewed by Paul Winner, Summer 2003*
177. Jonathan Lethem interviewed by Lorin Stein, 2003
178. Paul Auster interviewed by Michael Wood, Fall 2003
179. Jim Crace interviewed by Adam Begley, Fall 2003
180. Andrea Barrett interviewed by Elizabeth Gaffney, Winter 2003
181. Paula Fox interviewed by Oliver Broder, Summer 2004
182. Haruki Murakami interviewed by John Wray, 2004*
183. Tobias Wolff interviewed by Jack Livings, Fall 2004*
184. Barry Hannah interviewed by Lacey Galbraith, Winter 2004
185. Shirley Hazzard interviewed by J. D. McClatchy, Spring 2005
186. Salman Rushdie interviewed by Jack Livings, Summer 2005
187. Orhan Pamuk interviewed by Ángel Gurría-Quintana, Fall/Winter 2005
188. Peter Carey interviewed by Radhika Jones, Summer 2006
189. Stephen King interviewed by Christopher Lehmann-Haupt & Nathaniel Rich, 2006
190. Javier Marias interviewed by Sarah Fay, Winter 2006
191. Harry Mathews interviewed by Susannah Hunnewell, Spring 2007
192. Jorge Semprún interviewed by Lila Azam Zanganeh, Spring 2007*
194. David Grossman interviewed by Jonathan Shainin, Winter 2007
195. Kenzaburo Oe interviewed by Sarah Fay, Winter 2007
196. Kazuo Ishiguro interviewed by Susannah Hunnewell, Spring 2008
197. Umberto Eco interviewed by Lila Azam Zanganeh, Summer 2008
198. Marilynne Robinson interviewed by Sarah Fay, Fall 2008
199. Annie Proulx interviewed by Christopher Cox, 2009

200. John Banville interviewed by Belinda McKeon, 2009
201. James Ellroy interviewed by Nathaniel Rich, Fall 2009**
202. Ha Jin interviewed by Sarah Fay, Winter 2009
203. Ray Bradbury interviewed by Sam Weller, 2010
204. David Mitchell interviewed by Adam Begley, Summer 2010
205. Norman Rush interviewed by Joshua Pashman, 2010
206. Michel Houellebecq interviewed by Susannah Hunnewell, 2010*
207. Jonathan Franzen interviewed by Stephen J. Burn, 2010
208. Louise Erdrich interviewed by Lisa Halliday, Winter 2010
209. Ann Beattie interviewed by Christopher Cox, Spring 2011
210. Samuel R. Delany interviewed by Rachel Kaadzi Ghansah, Summer 2011
211. William Gibson interviewed by David Wallace-Wells, Summer 2011
212. Nicholson Baker interviewed by Sam Anderson, Fall 2011
213. Dennis Cooper interviewed by Ira Silverberg, Spring 2011*
214. Alan Hollinghurst interviewed by Peter Terzian, Winter 2011*
215. Jeffrey Eugenides interviewed by James Gibbons, Winter 2011
216. Bret Easton Ellis interviewed by Jon-Jon Goulian, Spring 2012*
217. Roberto Calasso interviewed by Lila Azam Zanganeh, Fall 2012
218. Deborah Eisenberg interviewed by Catherine Steindler, Spring 2013
219. Mark Leyner interviewed by Sam Lipsyte, Spring 2013
220. Imre Kertész interviewed by Luisa Zielinski, Summer 2013
221. Ursula K. Le Guin interviewed by John Wray, Fall 2013
222. Edward P. Jones interviewed by Hilton Als, 2013*

# Appendix 2: Participant Information Forms for Students

**Participant Information for the Following Research Project**:

**How might writers write differently? A study on how writers and their use of writing implements and surfaces relate to their writerly ways of thinking.**

*The following form outlines all the information required to assist you in giving informed consent to participate in this study. Please keep a copy of this information sheet for your records.*

**Investigator**: Kelsey Finkel, DPhil Candidate

**Contact Information:** kelsey.finkel@gmail.com / +44 7704234835 / +1 646 620 8059

**Purpose of the study:** This study has three key goals: 1) to understand what influences when and how writing implements (for example, pens and keyboards) and surfaces (paper and screens, for example) are used; 2) to identify which modes of transcriptions support which ways of thinking for which individuals; and 3) to develop understandings of how writers might effectively use available modes of transcription.

**Procedures**: Data will be collected over the course of roughly 8 weeks through various methods, potentially including: interviews, email response, iMessage conversations, and photographs (that you would take). Pending your consent, we will develop a schedule for the data collection. Data will be collected roughly six times, with each instance requiring roughly an hour**.**

**Compensation**: You will not be compensated for participating in this study.

**Risks and Benefits**: There are no risks and there are no direct benefits to participating in this research. However, the study will involve spending time thinking about and reflecting on one's writing practice in focused ways. Thus, participation should prove rewarding for the student's writing experiences.

**Confidentiality and Data Protection**: Your participation is voluntary and all responses are confidential. All data will be stored securely and protected through sufficient security measures.

**Complaints Procedures:** If you have a concern about any aspect of this project, please speak to me (kelsey.finkel@gmail.com / +44 7704234835 / +1 646 620 8059) and I will do my best to answer your query. If you remain unhappy and wish to make a formal complaint, please contact the Research Ethics Committee at the University of Oxford (ethics@socsci.ox.ac.uk; +44 (0)1865 614871; Social Sciences & Humanities Inter-Divisional Research Ethics Committee, Oxford University, Hayes House, 75 George Street, Oxford, OX1 2BQ, UK).

**Research Dissemination:** The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme. Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research. If you agree to participate in this project, the research will be written up as a thesis. On successful submission of the thesis, it will deposited both in print and online in the University.