

EXPLORING ART AS A MEANS FOR COMMUNICATION AND CONNECTION: FROM TECHNOLOGY-ENHANCED ART EXPERIENCES TO THE PARADOX OF SAD ART

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Abstract

Art is a powerful form of communication between artists and audiences. In this thesis, I will explore two questions that emerge from the literature on art as a means of communication and connection between artist and audience: 1) *how can technology be used to augment the sense of psychological connection between the audience and artist?* and 2) *why do we like sad art?*

To answer the first question, Chapters 2 and 3 present experimental data showing that listening to music while wearing haptic devices¹ (versus no haptics) and headphones (versus speakers) increases empathy, parasocial bond, and loyalty towards the artist and also decreases feelings of loneliness in the listener. Results indicate that feelings of social presence mediate the relationship between these immersive technologies and these measures of psychological connection to the artist. To answer the second question, Chapter 4 presents data from five experiments. Studies 1 and 2 show that framing a text as art versus not-art increases liking for the negative emotions expressed in it. Study 3 showed that there was an effect of art/not-art on liking even after controlling for differences in perceived fictionality between art/not-art. Study 4 found that appropriation² mediates the effect of art/not-art on liking and, thus, explains liking for sad art. Study 5 controlled for a possible confound in the study design and found that the results replicated. Together, this thesis explores art as a means of communication and connection by providing new insights on the use of technology to enhance connection with artists and by finding empirical evidence to support the philosophical debate on the enjoyment of sad art. These studies shed light on the ways in which art can be used to connect with others and also connect with ourselves and our own emotions.

¹ Haptic wearables are devices that translate bass frequencies in music into vibrations which can be felt on the skin via a device worn on the wrist.

² Appropriation refers to the phenomenon whereby the audience takes on the emotions expressed in a work of art and experiences it as if it is their own.

Detailed Abstract

Art is a powerful form of communication that can communicate about a wide range of ideas, thoughts, and emotions. Art can often convey the mental states of the artist, allowing audiences to form a connection with the artist and their work. In this thesis, I will focus on two questions that emerge from this literature on art as a means of communication and connection between artists and audiences: 1) *how can technology be used to augment the sense of psychological connection between the audience and artist?* and 2) *why do we like sad art?*

To answer the first question, Chapters 2 and 3 explore the role of immersive technologies in augmenting psychological connection to the artist when used to listen to music. Chapter 2 explores how headphones, a technology that creates immersion via the auditory modality, may influence the listener's sense of psychological connection to the artist. This study found that listening to music with headphones (versus speakers) increases empathy, parasocial bond, and loyalty towards the artist and also decreases feelings of loneliness in the listener. Results indicate that the feeling of social presence mediates the relationship between headphones and these measures of psychological connection to the artist as well as feelings of loneliness in the listener. Chapter 3 explores how a technology that creates immersion by influencing another sensory modality, the tactile modality, may influence the music listening experience. This study found that haptic feedback (versus no haptic feedback) increases empathy, parasocial bond, and loyalty towards the artist and also decreases feelings of loneliness in the listener. This study also found that social presence mediated the relationship between haptics condition and these measures of psychological connection to the artist and feelings of loneliness.

To answer the second question, Chapter 4 presents data from five experiments exploring the ways in which communication via art differs from communication in everyday life and why this might explain liking for sad art. Study 1 showed that framing sentences as either song lyrics (art) or Tweets (not-art) influenced liking for the text, but only when the content of the sentences were sad. Study 2 tested the generalizability of this finding and found an overall preference for sad art versus not-art across a variety of different kinds of artforms. Studies 3 and 4 identified potential reasons that could explain the effect of art/not-art on liking. Study 3 investigated the hypothesis that the perceived fictionality of art increases liking for sad art and showed that there was an effect of art/not-art on liking even after controlling for perceived fictionality. Study 4 explored an alternative hypothesis and investigated whether appropriation, a concept drawn from the philosophy of art literature, explains the effect of art/not-art on liking. Appropriation is the phenomenon whereby you take the emotions expressed in a work of art and experience them as an expression of *your own* emotions rather than the emotions of the artist. In other words, appropriation allows you to connect with the emotions expressed in art and make them your own. Results indicated that appropriation mediates the effect of art/not-art on liking and, thus, explains liking for sad art. Study 5 eliminated a possible confound in the study design and found that the results replicated.

Overall, this thesis explores two aspects art as a means of communication and connection. Chapters 2 and 3 provides the first empirical evidence that immersive technologies can augment the music listening experience by allowing listeners to form a greater sense of psychological connection to artists. Chapter 4 contributes the first empirical evidence for the philosophical concept of appropriation and provides novel insights on why we like the expression of negative emotions in art but not in everyday life. Thus, this thesis explores how art can be a means of connecting with others and also with ourselves, allowing for an exploration of our own emotional lives.

Declaration

I am grateful to my collaborators who provided invaluable feedback and suggestions throughout this DPhil process. The primary responsibility for experimental design, data collection, analysis, and writeup were all mine. I have provided details of my exact contributions and those of my collaborators below. The research described in this thesis covers experiments conducted in collaboration with the Oxford Department of Experimental Psychology and the Yale Department of Psychology.

Chapters 2 and 3 detail research conducted at Oxford University under the supervision of Dr. Rhonda Hadi. I identified the research question and experimental design in collaboration with Dr. Hadi and collected all in-person experimental data. I also analysed the data and drafted the manuscript with revisions and suggestions from Dr. Hadi and Professor Qian Janice Wang (University of Aarhus). Chapter 4 describe research conducted under the supervision of Professor Joshua Knobe (Yale University, Department of Psychology) and in collaboration with Mario Attie (Yale University, Department of Philosophy), and Professor George Newman (Yale School of Management). Based on concepts drawn from the field of the philosophy of art, I developed the interdisciplinary research questions and experimental designs detailed in these chapters, with discussion and feedback from my collaborators. I collected all online survey data, conducted the data analysis, and drafted the manuscript for publication with critical revisions and inputs from both Mr. Attie and Professor Knobe. I would also like to specially thank Professor Lucy Bowes for her invaluable suggestions on the General Introduction and General Discussion sections.

All work in this thesis is original and my own work, except what has been disclosed in this declaration. This thesis has not been submitted at another university or for any other degree.

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CHAPTER 1: GENERAL INTRODUCTION

Humans are extremely social beings. We are constantly interacting with friends, family, people within our community, and even strangers who we have never met before and may never meet again. Communication is central to our ability to interact and form relationships with others. Although social psychologists disagree on the exact definition of communication, they agree that there are four main factors that are necessary for effective communication (Hartley & Hartley, 1952). Firstly, there must be a communicator and, secondly, a communicant. Then there must be content which gets communicated. Finally, communication creates an effect. For example, I (the communicator) am writing this thesis for you (the communicant) and will be conveying something (the content) which might inspire you to read more about this topic (the effect). Human communication is usually studied by means of language but there are also non-verbal cues which can be used for communication such as gestures, tone, facial expression, clothing, drumbeats, and smoke signals (Hartley & Hartley, 1952). Non-verbal communication channels can convey a variety of information (Beattie & Ellis, 2017, p. 14). For example, wearing designer clothes can communicate information about social status, standing with erect posture can convey information about confidence, and nodding can indicate consent or agreement in some cultures and contexts (Beattie & Ellis, 2017, p. 17; Helweg-Larsen, Cunningham, Carrico, & Pergram, 2004; James, 1932). One method of communication that may be less obvious is art (Dissanayake, 1990). Dance can tell us stories, music can divulge information about the emotional state of the singer, movies can tell us about the lives of fictional or real events and people and so on. In this general introduction, I will explore art as a means of communication and how this relates to the studies discussed in this thesis.

What is art?

Before delving into the literature and the research questions in greater detail, I will begin by first defining what we mean by “art”. Philosophers have debated the definition of art for centuries and there is no consensus on what it means for something to be “art”. Tolstoy wrote in his essay *On Art* that for something to be categorised as art, it is necessary that its content should be “needful, important, and deserving of respect” (Tolstoy, 1959). Others have argued that art must be beautiful or aesthetic (Carroll, 2004; Gregor, 1983). Aesthetic does not automatically imply beauty in a positive sense. A highly grotesque painting can be aesthetically pleasing even if it is not beautiful in the way a Monet painting of waterlilies may be considered beautiful (Carroll, 2004). Aesthetics can be used to describe both natural objects and events as well as works of art (Shimamura, 2012). People can classify abstract ideas such as mathematics as aesthetic in the same way that they may classify Mozart’s Requiem as aesthetic (Johnson & Steinerberger, 2019). Works of art can, therefore, be a subclass of things that can be considered “aesthetic” but aesthetic things need-not always be art. Then there are others who argue against a definition of art altogether, asserting that “art” is an open concept and that there are “no necessary and sufficient conditions for [its] definition” (Weitz, 1956). It has been suggested, however, that one important precondition for being art is that the subject must be *regarded* as art (Dickie, 1969; Dipert, 1986). Dipert (1986) gives the example of a famous artist who is strolling on a beach, finds a beautiful piece of driftwood, and decides to display it in an art gallery. In this instance, there are two ways in which the object is regarded as art. First, the artist intends the driftwood to be a work of art. And second, the audience at the art gallery regards the driftwood as a work of art. In this example, the artist has done nothing to manipulate the piece of driftwood himself but certain philosophers deem this a sufficient condition to classify something as art (Dickie, 1969). Empirical evidence suggests that both the intentions of the creator and the context in which the object is displayed (e.g., a gallery

or concert hall) influence people's classification of objects as art. For example, one study showed that the artist's intent to call an object "art" is sufficient for others to categorise it as art (Jucker, Barrett, Wlodarski, 2014). Additionally, telling people that an image was either from a gallery or was computer-generated influenced people's hedonic valuations of the stimuli – people were more likely to form a hedonic response associated with evaluating artwork when they were told that the image was sourced from a gallery (Kirk et al., 2009).

In this thesis, I will use the term "art" to refer to anything that others have classified as art. This general introduction will introduce how art is a means for communication. My discussion will consider a variety of different art forms such as music, visual art, poetry, film, dance, and novels. While these art forms are very different and involve different pathways of cognitive processing, there is evidence to suggest that a common framework underlies how aesthetic judgements are made across sensory modalities (see Marin, 2015 for a review of literature on finding a general model of neuroaesthetics; Nadal et al., 2013; Vessel, Starr, & Rubin, 2012). There is also evidence that the cognitive underpinnings for making judgements about art objects are not confined to appraisals of art but also appraisal of a variety of not-art objects across sensory modalities (Brown et al., 2011). While there may be some differences between how specific artforms are processed in the brain, I am interested in observing how art is used as a tool for communication.

Art as a means for communication

Every culture around the world and across human history has created and engaged with art (Zaidel, 2010). Art is often a central part of social groups and has been described as "expressing the relevant central values of culture in abstracted form" (Nettle, 2005). Art plays an important role in cultural activities such as religious ceremonies, weddings, funerals, and celebrations (Dissanayake,

1990; Hargreaves & North, 1999). Evolutionary psychologists have proposed that, of the many benefits of art, the fact that it communicates and transmits information is important for social cohesion and survival advantage (Balkwill & Thompson, 1999; Dissanayake, 1990; Dunbar, 2012, p. 207; Zaidel, 2010). For example, art is a central part of religious ceremonies because it transmits information about religious identity, which creates a sense of social cohesion between members of a religious group (Pinkert, 2016). Evidence from hunter gatherer societies shows that music and dance are used to communicate information about activities important to survival that require people to coordinate, such as hunting (Hewlett & Cavalli-Sforza, 1986). Mothers singing lullabies to their babies communicate information about kinship and security, influencing the perceived closeness of mothers to their offspring and creating more secure infant-mother bonding (Fancourt & Perkins, 2018; Trehub & Nakata, 2001). Studies in contemporary western societies show that immigrants tend to actively engage in traditional artistic traditions from their country of origin to ensure the transmission and persistence of their culture as well as to form social cohesion among immigrant communities (Inman, Howard, Beamont, & Walker, 2007; Ferguson et al., 2016).

The psychology literature investigates the mechanisms that facilitate communication in communal art making (Dissanayake, 1990; Dunbar, 2012; Tarr, Launay, & Dunbar, 2014; Tarr, Launay & Dunbar, 2016, etc.). For example, communal singing and dancing are common to most cultures and play an important role in communicating information between members of the group, increasing empathy between members of the group, and promoting prosocial behaviours (Balkwill & Thompson, 1999; Dissanayake, 1990; Dunbar, 2012, p. 207; Zaidel, 2010).

A lot of art, however, is not participatory. Many films, art installations, dance performances, poems and books are not collaborative art making endeavours and involve a separation between the artist

and the audience. Furthermore, with the increase in consumption of recorded art forms like listening to music and watching movies via streaming services, art is often not consumed in group contexts where people can physically interact with artists and other fans (Wlömert & Papies, 2016). Thus, it is important for research to understand the psychological mechanisms that underlie the unidirectional transmission of information between the artist and audience irrespective of other group dynamics that might emerge from collective engagement with art like at concerts, group poetry/book readings, and public art galleries. In this thesis, I am primarily interested in the unidirectional transmission of information from the creator to the audience and will be reviewing the literature on what art communicates, how art communicates, and who communicates through art.

What does art communicate?

Art can communicate a variety of different kinds of information that can be roughly split into two general categories: cognitive and affective information (Bartsch & Hartmann, 2017; Geringer, Cassidy, & Byo, 1997).

Art can be used to communicate cognitive information across a wide range of complex concepts and ideas. For example, art can be used to transmit information about social identity. Hip Hop music and dance can communicate information about social class, race, and identity and national anthems communicate information about national identity, unity, and strength (Maira, 2000; Slater, Hasla, & Steffens; 2018). Art can also be used to communicate information about social movements, such as revolutions and protests, and mobilise people to act towards a common goal (Eyerman & Jamison, 1998). For example, folk songs were used to encourage people to join labour unions in the 1930's in the United States (Denisoff, 1983). Graffiti has played a significant role in

social movements and protests such as during the Arab Spring (Lennon, 2014). Choreographer and dancer, Erdem Gunduz, for example, performed the Standing Man in protest of the Gezi Park's destruction to make way for a shopping centre (Foellmer, 2016). Books, films, and comics have been a means of commenting on the political climate and society (Boatright, 2010; Urgo, 1985). In fact, art is such a powerful tool for communicating about identity, politics, and society that empirical studies have shown that art can create neo-tribal groups among strangers from a variety of different social groups (Chepp, 2012; Riley, Griffen, & Morey, 2010; Rentfrow, 2012). In an increasingly globalised world, fandoms of subgenres of art can commonly bond over a set of messages or values conveyed through the art. Art can communicate about scientific concepts like climate change and innovation (e.g., Barasch, 2010, Curtis, Reid, & Ballard, 2012; DiPaolo, 2014, Roosen, Klockner, & Swim, 2018). Art can also be used to communicate about the art itself. In music and dance, it is important for the music to communicate information about how a piece should be performed (D'Ausilio et al., 2015; Dunbar, 2012). For example, a musical score communicates how the performers should play the music (D'Ausilio et al., 2015). Furthermore, the metre or rhythm of a song can communicate information about how people should move and synchronise their movements when dancing (Tarr, Launay, & Dunbar, 2016). Art can communicate about both real and fictional things. It encourages us to use our imaginations to comprehend narratives about lands, people, and creatures that we have never encountered ourselves (Dill-Shakleford, Vinney, Hopper-Losenicky; Dutton, 2004). The capacity of art to transmit complex concepts and ideas is why sociologists, anthropologists, and psychologists believe art to be a powerful tool for learning and social change (Greene, 1995; Thomas & Rappaport, 1996).

The second type of information that art can communicate is affective information. Research shows that a variety of different art forms can convey emotions. For example, there is a wealth of work on music which suggests that people are able to accurately identify specific emotions, such as joy or sadness, in music (e.g., Egermann & McAdams, 2013; Kallinen & Ravaja, 2006; Lundqvist et al., 2009; Menninghaus et al., 2015; Schubert, 2013). People can identify anger, happiness, sadness, and fear in music across genres and cultural styles (Balkwill, Thompson, Matsunaga, 2004; Fritz et al., 2009). Studies have also shown that people are able to identify emotions like anger and sadness in visual art (Cohen et al., 2016; Silvia, 2009; Pelowski, 2015; Pelowski et al., 2018). There is also research which suggests that there is cross-cultural consensus on expressions of sadness, happiness, anger, and fear in visual art (Balkwill & Thompson, 1999). Studies also show that gesture and facial expressions in dance can communicate complex feelings, such loss and sorrow (Nystrom & Lauritzen, 2005). Novels and poems can convey the emotional state of characters both real and fictional (Mar & Oatley, 2008). In fact, art is such a powerful means of communicating emotion that it is often used to induce mood in psychology experiments (Fernandez-Aguilar et al., 2018; Vastfjall, 2001).

While art may communicate either cognitive information or affective information, it often communicates both at once. For example, music can communicate cognitive information about social status and distrust of certain social groups and can also communicate affective information such as anger (Rubin, West, & Mitchell, 2001). Novels can communicate narrative information as well as information about the mental life and emotions of characters through descriptions (Mar, Oatley, Djikic, & Mullin, 2011). For example, an author can describe a “dark, stormy evening” which can refer to the setting and also to the mental state of a character who is feeling angry (Mar & Oatley, 2008). In sum, art can communicate about a complex range of ideas and emotions.

How does art transmit information?

Art is a particularly unique tool for communication because it allows for both linguistic and non-linguistic communication. In the case of art that has a linguistic component, language is the means of communication with the audience. For example, when Eric Clapton sings, “*Would you hold my hand/ If I saw you heaven?/ Would you help me stand/if I saw you heaven?*”, he is expressing his grief at the loss of his son (Clapton, 1992). While there may be some ambiguity about exactly who he is talking about without the context Clapton’s life story, there is no question that he is distraught. Songs are not the only forms of art that rely on verbal communication. Graffiti is a visual art form that can be used to communicate verbally (Rodriguez & Clair, 1999). Films often use the spoken word and novels use the written word to communicate information to the audience via language (Coplan, 2004; Mar et al., 2011). Literature and poetry can use indirect linguistic tools to convey meaning. Literary techniques such as metaphors, similes, hyperbole and allusions can indirectly convey meaning (Menninghaus et al., 2017). Empirical studies show that people are able to accurately extract emotional content from indirect linguistic communication, such as metaphors in literature (Bowes & Katz, 2015).

Not all art forms, however, rely on language. Many artforms are nonverbal and yet they can communicate affective information through the “formal properties” of the art form (Barwell, 1986; Stecker, 1984). Formal properties are the components of art such as tempo and melody in music, colour and shape in art, and lighting and camera angles in film. The formal properties of art follow a rhetorical framework that is not dissimilar from language. Formal properties are a symbolic system of communication, much like language, that can convey both structure (grammar) and meaning (syntax) (Juslin & Timmers, 2010; Sellnow & Sellnow, 2010). While art may not

contain the specificity of language, the selection and organization of the formal features of art allows artists to capture symbolic meaning and even convey meaning that may be difficult to articulate linguistically (Hagberg, 1998). Furthermore, the “floating intentionality” of art that does not contain a linguistic component, such as instrumental music and abstract art, creates room for individual interpretation in a way that is not possible with language due to its specificity (Ball et al., 2018; Cross, 2005). Stroud (2007) suggests a framework for how art can communicate information when there is no linguistic component to the artwork. The premise begins with the idea that the artist wants to invoke certain experiences or thoughts in the audience but cannot do so directly without language. The artist must, therefore, rely on non-linguistic means (e.g., the selection and organization of formal features) to evoke the experience in the audience.

Extensive research has been conducted in the domain of instrumental music, demonstrating that people can perceive emotion through the formal features of the music (e.g., Juslin & Laukka, 2004; Thompon & Robitalille, Vusokoski, McIwain, Eerola, 2012). For example, the key, tempo, dynamics and harmonies and the order of these “sonic and gestural qualities” can communicate information about emotions in music (Gabrielsson & Juslin, 1996; Cross & Morley, 2009). Features such as low sound levels, slower tempo, and minor chords can all give rise to music that sounds sad. By contrast, high sound levels, faster tempo, and major chords are associated with joyous music (Gabrielsson & Lindstrom, 2001; Juslin & Laukka, 2004; Khalfa et al., 2008). While the communication of emotion via music may not be as specific as the communication of emotion via language, studies show that the cognitive mechanisms that underlie the processing of semantic meaning in music and language may actually be quite similar (Koelsch et al., 2004).

Colour, size of objects, and line thickness can influence people's perceptions of emotion (Burkitt, Barrett, & Davis, 2009; Konecni, 2015). People are able to identify and form a consensus about the emotions conveyed in representational art forms such as abstract art (Stravrova & Meckel, 2017). Furthermore, expressions on the face of humanoid forms present in artwork may convey emotional information (Barwell, 1986; Winston, Kenyon, Stewardson, & Lepine, 1995). A large sample study found that people are good at extracting emotional content from a wide range of artistic stimuli ranging from reproductions of faces to colour swatches and abstract designs (Mayer, DiPaolo, & Salovey, 1990).

Music and visual art generally rely on auditory and visual sensory modes of communication respectively but many art forms use a combination of sensory modalities to communicate information. Visual and musical elements of dance such as the use of certain body parts, size of gestures, and tempo of movement can convey emotions such as joy, sadness, and anger (Nystrom & Lauritzen, 2005; Sawada, Suda & Ishii, 2003). In ballet, specific dance moves are actually choreographed into pieces to convey certain kinds of emotions, such as a jetes (jumps) which convey joy and ecstasy (Bannerman, 2014). In film, both visual and auditory features can convey emotions. Visual components of film such as lighting and use of close-up shots can influence perception of emotion in film (Coplan, 2006). For example, use of prolonged close-up shots of Uma Thurman's face are used to induce a sense of anxiety or unease in the film *Kill Bill Vol. 1*. Auditory components such as film soundtracks also provide a means of communicating emotion in film. Music has been shown to foreshadow happiness, sadness, fear, and anger when viewing an excerpt of a film (Tan, Spackman, & Bezdek, 2007). One study showed that music can alter perception of the affect and arousal of animated geometric figures (Marshall & Cohen, 1988).

Together, visual and auditory formal features in film can communicate emotions such as amusement, anger, disgust, fear, happiness, and sadness (Jenkins & Andrewes, 2012).

Thus far, I have discussed the extensive literature on how formal properties may be used to communicate information in art. There are also, however, contextual properties of the art which may also convey information. Proponents of the art-historical approaches to evaluations of art suggest that the historical context of an art object can also convey information about an artist's message, state of mind, and intent (Bullot & Reber, 2013). Interpretation of a work of art may depend on a variety of different contextual cues, such as "how [the art] is original or unusual, whether it emulates, subverts, rejects, or redirects the default conventions and art practices of the time, the extent to which its use of the tradition is self-conscious..." (Davies, 2006: 227). Understanding the context of the artwork may convey complex information about the cultural influences and the political views of the artist (Bullot & Reber, 2013). Taken together, a substantial body of research has shown that art uses both linguistic and non-linguistic mechanisms to communicate complex ideas and emotions. In the next section, we will investigate whose emotions can be communicated via art.

Whose emotions are communicated via art?

Art can be a way of sharing "how it feels" or "what it is like" to be someone else (Swanger, 1993). That "someone else" can be the characters featured in the art, an abstract persona, or the artist. First, art can communicate the emotions of characters represented in works of art. Films, plays, novels, and comic-books can communicate information about the mental and emotional states of fictional or non-fictional characters (Carney et al., 2014; Coplan, 2004; Stiller, Nettle, & Dunbar, 2003). For example, a novel can convey information about a particular social situation prevalent

in a different country or provide insight into the thoughts and experiences of people who are very different from you (Keen, 2006). Studies show that people are capable of identifying and understanding the mental states and emotions of characters when reading novels or watching movies about fictional characters (Kidd & Castano, 2013; Levin, Hymel, & Baker, 2013; Mar & Oatley, 2008; Rooney & Balint, 2018).

Second, art philosophers have proposed that people may engage with art as the expression of the thoughts and emotions of an imagined artistic voice called a *persona* (Peters, 2015). This *persona* is the personification of the art, an imagined person who gives voice to the emotions expressed in the art. The *persona* is neither the creator nor an actual character specified in the art (Levinson, 2006). Levinson discusses the concept of the *persona* with regards to instrumental music. He suggests that imagining a *persona* when listening to instrumental music allows us to attribute emotions to an imagined agent and form a bond with that person instead of experiencing music as a disembodied, intellectual endeavour (Levinson, 2004). This does not mean that the art was necessarily created by the artist in order to express the emotions of a “*persona*”. It just means that even if the artist created a work to express their own emotions, the audience may choose to imagine the *persona* conveying those emotions rather than imagining the artist *per se* (Cone, 1974). So, for example, when we read “*My heart aches, and a drowsy numbness pains/My sense, as though of hemlock I had drunk*”, we might not imagine that the “I” is John Keats himself. Instead, we might imagine a *persona* who is the conduit of Keats’ words (from Cone, 1974).

Third, art can communicate the emotions of the creator. Art can communicate what the artist was feeling at the time of creating the work or memories of emotions they have previously experienced (Peters, 2015). Art is often inspired by events that have occurred in one’s life and some academics

believe that art exists because artists are compelled to communicate their experiences when they feel extreme emotions in response to major life events (Knoecni, 2012). A series of qualitative studies by Simonton (1977, 1980; and 1987) seem to support this hypothesis based on evidence from the domain of classical music. These studies found a positive correlation between melodic originality and adverse events in life in the music of Bach, Beethoven, Mozart, Haydn, Brahms, Handel, Debussy, Schubert, Wagner, and Chopin (Simonton, 1980; Simonton, 1977; Simonton, 1987). Melodic originality was correlated with periods of “biographic stress”, defined as major life events such as lawsuits, marriages, deaths, divorces, jail/exile, etc. That said, however, Simonton’s studies are limited for a variety of reasons. For one, they only investigated major adverse life events and did not specifically study the emotions felt by the artist. Additionally, the studies were restricted to 10 composers within the domain of Western classical music, bringing into question the generalizability of these findings.

Regardless of what inspires people to create art, it is clear that art communicates emotions and that people perceive art to convey the emotions of others (e.g. Cohen et al., 2016; Mar, Oatley, Djikic, & Mullin, 2011; Menninghaus et al., 2015; Nystrom & Lauritzen, 2005). That said, very few empirical studies explicitly clarify whose emotions are being expressed in the work of art. Studies on novels or films involving characters aim to investigate people’s ability to identify the emotions of the characters in those artworks. In studies on instrumental music and abstract art, for example, experiments rarely clarify whether participants are experiencing the work as an expression of the creator’s emotions, the performer’s emotions, the imagined persona’s emotions, or just some abstract representation of emotions.

Musicologist Ian Cross (2014) suggests that the lack of research focus on whose emotions are communicated through art is explained by the fact that most research is conducted on Western audiences and on Western art forms. In the West, art is viewed as a “hedonic commodity” rather than a social object for communication. Hence, the focus of many psychology of art studies is geared towards understanding how the formal properties inherent to the art allow people to perceive emotions and appreciate art and not how art can be a means of communication between artist and audience.

There is, however, a growing body of evidence which suggests that people think about art as a product created by the artist in order to express their emotions. In the next section, I will review the philosophical theories and empirical evidence for art as an expression of the artist’s emotions.

Art as an expression of the artist’s emotions

As the artist Eugene Delacroix once said, an artwork is a “bridge between the mind of the [artist] and that of the spectator” (in Goldwater & Treves, 1958: 230). According to Delacroix, “Successful art...creates a connection between the participant’s sensibility [and] the sensibility of the artist” (in Goldwater & Treves, 1958: 230). It has been suggested that the process of listening to music is a “mind-mind game” where the listener tries to understand what it is like to be in the mind of the composer through their music (Cusick, 1994). The concept of intentionalism, first discussed in the philosophy of art literature, suggests that inferring the intentions and mental states of the artist are integral to interpretation of an artistic work (Carroll, 1997; Carroll, 2000; Hirsch, 1984; Iseminger, 1996). As philosopher Peter Kivy says, “It seems fairly clear...that parts of Mozart’s *Requiem* (K. 626) express the composer’s terror of death, and are not merely expressive of terror” (Kivy, 1980: 15).

Some scholars argue, however, that art should not be interpreted as an expression of the artist's intentions or emotional states. This view is known as the "intentional fallacy" (see Dickie & Wilson, 1995 and Taruskin, 1982 for a discussion). The author C.S. Lewis first posited this argument when he said that it is a fallacy to presume that "all poetry is about the poet's state of mind" and that it is the responsibility of the reader to infer the poet's state of mind from the text (Dickie & Wilson, 1995). Additionally, some scholars, like Dickie and Wilson (1995), debate whether the author's intention and state of mind are even relevant to interpretation of an artwork.

Empirically evidence, however, seems to suggest that we are intuitively intentionalists and that we tend to interpret art based on the intentions and mental states of the creator. The extended-self hypothesis suggests that our beliefs about the mental states of the artist can influence appreciation for and interpretation of art (Belk, 1988; Newman & Smith, 2014; Newman, Bartels, & Smith, 2014). For example, one study showed that people enjoy music more when they are given more personal and historical information about the composer (Halpern, 1992). A recent study has also shown that priming participants with information about the personal identity of a composer, influences their emotional and empathetic responses to the composer's music (Kiernan, Krause, & Davidson, 2021). A qualitative study on people's beliefs about the composition process found that people believe that composers use music as a means of exploring their personal identities and communicating that identity with others (Schiavo et al., 2020). These studies show that information about the mental states of the artist are more closely tied to people's evaluation of the art than technical information about the artist.

Another study found that when people were told that the music they were listening to was written by a composer (a human product), there was activation of the anterior medial frontal cortex, superior temporal sulcus, and temporal lobes (Steinbeis & Koelsch, 2009). This did not happen when people were told that the music they were listening to was composed by a computer (a nonhuman product). The brain regions activated in the human product condition were the same cortical regions that activate when performing mental state attribution tasks, which suggests that people tend to think of the mental state of the composer only when the composer is human and is capable of possessing phenomenal and intentional states.

In the domain of visual art, studies show that information about the artist and their process can influence liking, perception of quality, and emotional reaction to the art (Belke, Leder, & Augustin, 2006; Smith & Newman, 2014). One study found that the personality of the artist influenced evaluations of both paintings and music (Tilburg & Igou, 2014). Another study found that perceptions of the emotions in a work of abstract visual art were influenced by descriptions about the mental state of the artist when they painted the work (Stravrova & Meckel, 2017).

One potential problem with art forms that are performed, like music, poetry recitations, and plays, is that it is not clear whether we are attributing the emotions in a work to the creator (e.g., composer, choreographer, etc.) or the performer (Peters, 2015). For example, is it Mozart's emotions or the conductor's emotions or the singers' emotions that are being conveyed when listening to a performance of the *Requiem*? One suggestion is that both the composer and the performer are the creators of the work (Peters, 2015). So, when we listen to a performer's particular interpretation of the *Requiem*, we are perceiving the emotions of Mozart *and* the performer who interprets his piece in terms of their own emotional experiences. Some studies

have tried to circumvent the question of whether art is perceived as the reflection of the performer's or composer's emotions by designing studies where the composer and performer are the same person. For example, a study on music asked participants to identify the emotion expressed by the singer-songwriter in a study that used stimuli with actual singers and it was therefore clear that the emotion expressed was that of the performer-composer (Lundqvist, Hilmersson, & Juslin, 2009). Another study asked composers to write and perform their music to an audience and results found a correlation in physiological data between the composer's/performer's intentions and audience's impressions of the music (Evans, Munekata, & Ono, 2014).

One possible question that might arise from this literature on audiences perceiving the emotions of the artist is how to build and enhance the connection between the artist and the audience. From the artist's point of view, it is crucial to understand the relationship one builds with audiences and how to augment that relationship (Kaya et al., 2010). From the audience perspective, it is important to understand how connection to an artist deepens our engagement with artistic experiences and how that impacts our enjoyment of art (Stewart, 2013). In the first section of this thesis, I investigate one possible way of augmenting the audience's sense of psychological connection to the artist.

PART I: HOW CAN TECHNOLOGY BE USED TO AUGMENT THE SENSE OF PSYCHOLOGICAL CONNECTION BETWEEN THE AUDIENCE AND THE ARTIST?

If people do engage with art as an expression of the artist's mental states, one implication is that people can form a sense of psychological connection to the artist. Much of the psychology

literature has shown that people form empathetic reactions when engaging with art. While there are a variety of conflicting definitions of empathy, most psychologists agree that empathy consists of two components: the cognitive process of perspective taking and the affective process described as “feeling with someone else” (Baron-Cohen & Wheelwright, 2004; Harris, Johnson, Hutton, Andrews, & Cooke, 1989; Preston & de Waal, 2002). The research I have previously discussed on the perception of emotion in art is a consequence of the cognitive process of perspective taking, which involves recognising the emotion in a work of art and inferring information about the mental state of the creator. For example, studies I have previously discussed which show that people are able to identify sadness in art and make intuitions about the artist’s state of mind and intentions are an example of cognitive empathy (e.g., Gabrielsson & Lindstrom, 2001; Juslin & Laukka, 2004; Stravrova & Meckel, 2017).

Affective empathy, on the other hand, is the sharing of inferred mental states with someone else and it is highly related to the concept of emotional contagion, or the autonomic mimicking of emotional states (Gallese, 2003). There has been considerable research showing that the audience subconsciously mimics the emotions in a work of art (Gallese, 2003). In a sense, the individual can “catch” the emotions of someone they may not have necessarily met, like an artist, by interacting with the artist’s work (Stravrova & Meckel, 2017). Stravrova & Meckel show that there is a high degree of correlation between experienced emotions and perceived emotions of the artist when encountering a work of abstract visual art. A study on instrumental music similarly found that participants’ ratings of their own valence and arousal corresponded to ratings of valence and arousal of the music that they were listening to across 23 musical excerpts (Egermann & McAdams, 2013). A study on poetry demonstrated writer-reader emotional contagion effects - when participants read a poem that conveyed the writer’s feelings of awe or enthrallment in their

work, they also reported feeling awed or enthralled (Thrash et al., 2016). There are also studies that measured physiological factors, such as zygomatic facial muscle activity, heart rate, skin conductance, and finger temperature, which found that the emotions induced in the listener are the same as the emotion expressed by the composer through their music (Baltes, Miclea, & Miu, 2011; Lundqvist et al., 2009; see Kayser 2017 for a review of four facial expression measures as a means of studying emotion contagion in music).

There are, however, approaches to studying psychological connection other than emotion contagion. One alternative is to study parasocial relationships, a concept drawn from media psychology which suggests that people can form one-sided relationships with individuals they encounter in the media (Horton & Wohl, 1956). This kind of psychological relationship is particularly relevant to studying the audience-artist connection because people often form parasocial relationships with celebrities, radio personalities, film stars, athletes, and pop musicians (Earnheardt & Haridakis, 2009; Kurtin et al., 2019; Rubin & Step, 2000; Wohlfeil & Whelan, 2012). Artists such as actors and musicians share details of their lives on social media, release tour documentaries, and find new ways of sharing their personal lives with fans (Kurtin et al., 2019). For example, Beyoncé shares pictures of herself backstage, of her kids, her food, where she goes on holiday on her Instagram page and she has approximately 170 million followers as of February 2021 (Statistica). Studies show that one consequence of celebrities sharing details of their personal lives is that fans may form a personal connection with these celebrities and report feeling as though they “know” them (Rubin & McHugh, 1987). More recently, studies have shown that a musician’s ability to create and perform music may signal qualities like talent and authenticity and generate a parasocial response in their listeners (Kurtin et al., 2019).

Understanding how to augment these empathic and parasocial relationships between audiences and artists is important for artists, people who market the arts, and for art consumers. One factor that has been leveraged to augment this artist-audience relationship is technology. Technology has enabled artists to interact with fans from anywhere in the world and audiences to interact with art and its creators in new ways. For example, social media has changed the way in which artists and fans engage with each other and studies show that interacting with artists via social media can influence people's sense of connection to artists and consumer behaviour (Click, Lee, & Holladay, 2013). Research also shows that forums such as YouTube and TikTok allow fans to create their own content inspired by artists and this has an impact on connection to artists (Lee & Nguyen, 2020). Crowdsourcing technologies such as Kickstarter have changed the way in which people can contribute to the financial success of artists and this can influence sense of investment in artists (Williams & Wilson, 2016). There is also a growing trend in engaging with art via technologies such as virtual reality, augmented reality, and haptic wearable devices (DeCesare & Wang, 2021; Irving, 2020). While there has been a rise in demand for technology-mediated art consumption experiences, empirical research has yet to show if or how these devices can increase our sense of connection to artists.

There is also research showing that specific kinds of technology, like immersive technologies, can increase our sense of psychological connection to others because they increase sense of social presence. Most of this work has been done in non-artistic domains. For example, studies show that that virtual reality can increase both cognitive and affective empathy for digital personas present in virtual environments (Shin, 2018). Virtual reality gaming studies also show that people can form parasocial relationships with avatars in video games (Jin & Park, 2009). Consumer behaviour studies show that brands can build customer loyalty in virtual shopping environments

(Kerrebroek, Brengman, & Willems, 2017). Studies also suggest that these technologies increase sense of connection to others because they generate a sense of social presence, or the feeling that people or creatures in a mediated environment are “there” with the user in the real world (Baecker et al., 2014; Basdogan et al., 2000; Chang & Sullivan, 2005). As another consequence of increased social presence, these technologies also decrease feelings of loneliness in the user when they are using these technologies (Sallnäs, Rasmus-Gröhn, & Sjöström, 2000). This research, however, is not specific to how technology mediates the art consumption experience.

In the first section of this thesis, my experiments aim to test if the effect of increased psychological connection to digital personalities in technology-mediated environment translates into the art consumption context. Specifically, I investigated two immersive devices that are less frequently studied than virtual and augmented reality and their application to the music listening experience. The first technology I investigated is headphones, a ubiquitous technology that is commonly used for listening to music. Music is, largely, an auditory art form and headphones generate a sense of immersion by influencing the auditory pathway and creating an auditory barrier between the user and their environment (Kallinen & Ravaja, 2007; Zelechowska et al., 2020). There is some initial research suggesting that headphones can influence sense of connection to mediated others³ (e.g., Kallinen & Ravaja, 2007). I will apply this research to the context of music by studying how headphones influence sense of psychological connection to the artist, where psychological connection is measured by a number of variables such as cognitive empathy with the artist, the parasocial relationship with the artist, and artist loyalty.

³ “Mediated others” refers to individuals in the technology-mediated environment (de Kort & Ijsselstein, 2008). For example, in the case of virtual reality, this could be a person or avatar in the virtual environment. In the case of headphones, this could be the person speaking or singing in the audio track that one is listening to.

The second technology I will investigate is haptic wearable devices, devices that deliver vibrotactile feedback against the skin in response to low frequency sounds from an audio input (Turchet, West, & Wanderly, 2020). This technology was chosen because sound is a multimodal phenomenon that can be experienced both sonically and via vibrations (Trivedi, Alqasemi, & Dubey, 2019). Therefore, I investigated whether haptic feedback influences the music listening experience. Specifically, I studied whether haptic wearable devices influence our sense of psychological connection to the artist as measured by cognitive empathy with the artist, the parasocial relationship with the artist, and artist loyalty. These results of this work have important implications for art appreciation and consumption and suggest low-cost, novel ways to augment the music listening experience for consumers.

Thus far, I have discussed art as mode of communication between artist and audience and introduced the first section of my thesis, which examines how immersive technologies can augment the sense of connection between the audience and artist. In the second section of this thesis, I will explore another mechanism by which the audience connects with the artist. I will discuss the ways in which communication via art differs from everyday communication and how this allows us to connect with and enjoy the expression of negative emotions in art even though we do not enjoy the expression of negative emotions in everyday life.

PART II: WHY DO WE LIKE SAD ART?

There are some fundamental differences between communicating via art and other forms of communication. This stems from the fact that art is not solely a tool for communication. While art can successfully communicate information, as discussed above, its purpose extends beyond the scope of everyday communication. One peculiarity of this discrepancy between communication

via art versus everyday communication is that we seem to enjoy the expression of negative emotions in art but not in everyday life (Levinson, 2013). In the philosophy literature, this is what is known as the paradox of *negative emotions in art* (Aristotle, trans. 1997; Augustine trans. 1960; Hume 1758/1987). Consider listening to a song about how depressed and lonely someone is feeling. In the song, the singer sings about how isolated and disillusioned they have been feeling with the world lately. While the content of this song is clearly depressing, you might acknowledge that there is something wonderful about listening to it – perhaps there is even something enjoyable about listening to it. Now consider sitting at a coffee shop and someone comes up to you and expresses those exact same depressed feelings. There is something really unenjoyable and uncomfortable about this experience. So, what accounts for the difference in response to the expression of negative emotions in art versus everyday life?

One obvious difference is that art is substantively different from everyday communication because it consists of formal features which make it aesthetically pleasing and enjoyable. Examples of formal features in art are melody and harmony in music, metre and rhyme in poetry, and colour and texture in visual art (Schier, 1983). Empirical evidence suggests that the formal aesthetic features in various art forms (such as symmetry in visual art, consonance in music, or parallelism in poetry) contribute to increased processing fluency and, therefore, liking of art (Alter & Oppenheimer, 2008; Reber, Schwartz, & Winkielman, 2004). Generally, everyday speech, Tweets, emails and other forms of not-art communication lack these formal features. Hence, focusing on these formal properties when engaging with art makes the experience enjoyable in a way that is different from everyday communication. The formal features may also allow us to focus on aesthetically pleasing aspects of art which enable us to enjoy the expression of negative emotions in art. Thus, while art is a means of communication, the content that is being communicated is

not always the sole interest of the audience. The audience may also attend to *how* the art communicates information and the formal features in art are what allow us to enjoy the expression of negative emotions in art. This view is supported by numerous empirical studies which demonstrate that the features intrinsic to the art (the formal properties like rhyme, melody, colour, etc.) make sad art enjoyable (Menninghaus et al., 2017; Rolison & Edworthy, 2012).

There is, however some empirical evidence suggesting that simply framing or conceptualising something as art allows you to enjoy the expression of negative emotions. For example, studies have shown that simply framing a photograph as art versus not art influences liking for macabre or disgusting images (Greger, Leder, & Kremer, 2014; Wagner et al., 2014). So, why might simply conceptualising something as art make the expression of negative emotions enjoyable? Research suggests that the concept of “art” carries connotations about fictionality and safety and that these associations may explain why we enjoy the expression of negative emotions in art.

For one, people may assume that art is based on fiction and that the perceived fictionality of art is what contributes to liking of negative emotion in art but not in real life. Art can be used to communicate about things that we do not normally engage with on a regular basis. For example, art can be about fictional things which we don’t discuss in everyday conversations. The psychology literature draws a distinction between the concepts of “fiction” and “fake” and research shows that people are more engaged when reading a text that they were told was fictional versus when they were told it was fake (a fabricated story presenting itself as true) (Appel & Malakar, 2012). This is an important distinction because while we regularly lie or propagate falsities in everyday conversation, we rarely communicate about fantastical things in contexts outside of art e.g., people rarely sit around talking about dragons but people often create art about dragons.

There are, however, some kinds of fiction that are less obviously fictional because they are not based on fantasy and are, instead, based on plausible things. Art can be about plausible negative topics like robberies, depression, murder, etc. Art is also about plausible negative emotional states, like grief at the loss of a loved one or teenage angst. It has been suggested that this kind of realistic fiction is enjoyable because it allows people to explore thoughts, ideas, and fantasies in a safe environment that has no real-world consequences (Eaton, 1982; Oatley, 1999). Fiction allows us to experience negative things within certain bounds and gives us control of our situation (Eaton, 1982). The fact that a negative thing did not happen allows you to feel safe and controlled in the environment when engaging with art. When there is decreased fear of real-world consequences, anxiety levels decrease and we can focus our attention on more enjoyable features of the art, such as the characters, plot, etc. (Menninghaus et al., 2017; Pouliot & Cowen, 2007).

Fiction may also imply a sense of psychological distance from the person, object, or event described in the art, which reduces the emotional immediacy of negative emotions and allows the audience to appraise the aesthetic qualities of the artwork (Menninghaus et al., 2017; Mastandrea, Fagioli, & Biasi, 2019). A cinematic depiction of a lion jumping out at you may evoke terror but not the flight response you would expect to experience if a real lion was chasing you. Some researchers suggest that it is the lack of the flight response that allows one to engage with the film and transform the negative experience of terror into a positive, aesthetic one (Cupchick, 2002; Tooby & Cosmides, 2001). There is empirical evidence to support this hypothesis. For example, a greater sense of psychological distance from a negative or distressing event has been shown to reduce arousal and increase positive affect (Lazarus & Alfert, 1964). Framing unpleasant photographs as fictitious movie scenes versus real scenes influences Late Positive Potential (types

of EEG signals) associated with viewing the photograph (Mocaiber et al., 2010). Specifically, people who thought they were seeing photographs of real events exhibited larger Late Positive Potential responses than the baseline while there was no significant differential in Late Positive Potential responses for people who thought they were looking at a movie scene. In other words, there was greater EEG activity associated with increased stress in the real conditions, providing evidence for a distancing model of processing. Furthermore, framing photographs of mutilated bodies as either real or scenes from a fictional movie influences cardiac activity (Mocaiber et al., 2011). The authors found greater bradycardial activity in reaction to mutilation photographs compared to neutral photographs in the real conditions. There was no modulatory effect on heart rate responses between the photographs of mutilation and the neutral photographs in the fictitious conditions. The authors explain these results by suggesting that the framing of the fictitious conditions may have implied a greater degree of safety and decreased danger. Hence, if framing an object as a work of art generally leads people to be more inclined to regard it as purely fictional, one should expect greater liking for depictions of sad events when these depictions are presented as works of art.

Thus far, we have discussed the many ways in which the implied fictionality of art may contribute to the enjoyment of sad art. Another possible explanation as to why people enjoy sad art is that we don't automatically think of and apply the same social norms of everyday communication to art contexts and this can imply several different things.

For one, when we engage with art, there is no obligation to feel concerned for the characters, the creator, or to coordinate action responses (Coplan, 2004). Intuitively, this makes a lot of sense. If Mozart was simply telling you about how sad he was, an appropriate response might be to feel

empathetically sad and ask if he is okay. When listening to Mozart's *Requiem*, however, the first reaction is not to ask about Mozart's well-being. Instead, while we appreciate that the *Requiem* is a manifestation of Mozart's sadness, we do not apply the same social norms of feeling concerned for Mozart when listening to his music. When engaging with art, we do not need to react with the same psychological reactions and coordinated behaviours we would normally respond with when engaging with someone in real life.

Additionally, art may give us licence to be transported and absorbed into the narrative world. The theory of narrative transportation was first posited in the media psychology and it suggests that we derive enjoyment from feeling immersed in a narrative world, experiencing the consequences of that immersion in the narrative world, and connecting with characters in the narrative world (Busselle & Bilandzic, 2008; Green, Brock, & Kaufman, 2006). While we may often empathize and engage in theory of mind in everyday social interactions, we do not experience this same kind of transport or absorption that can happen when engaging with art (Djikic & Oatley, 2014; Herbert, 2011; Murphy et al., 2013). There is some empirical research to suggest that people tend to feel transported or absorbed by art but not by not-art. For example, one study showed that people reported greater feelings of absorption when listening to music compared to other, non-artistic activities (Herbert, 2011). There is also evidence that presenting a text as a narrative increases feelings of transportation and empathy to the characters in the story as opposed to when a text is presented in non-narrative form (Walkington, Wigman & Bowles, 2020). Another study showed that framing negative information (in this case, information about cervical cancer) in a narrative versus non-narrative format influenced feelings of transportation and empathy towards the characters in the story. Transportation and absorption have also been proposed as a potential explanation for why we enjoy negative emotions in art (Hanich et al., 2014). For example,

one study found that people enjoy sad films to the extent that they feel transported and involved with the narrative (Ahn, Jin, & Ritterfeld, 2012). Another study found that narrative transportation increased feelings of appreciation, awe, and inspiration when engaging with a work of art that expresses negative emotion (Oliver & Bartsch, 2011).

Finally, art may not only give us licence to feel transported and absorbed in narrative world, it may also give us license to appropriate emotions in a way that we cannot in everyday life. Appropriation is a concept described in the art philosophy literature as the process that occurs when you experience an emotion as if it is your own (Levinson, 2014; Ribeiro, 2014; Walton, 1988). To give an example, consider the “I” in lyric poetry. When a poet says “I feel so alone”, one might think that the poet is referring to herself. If one appropriates the poem, however, the feelings expressed in the poem become an expression of your own emotions (Ribeiro, 2014). In other words, you can read a line “I feel so alone” in a poem and experience that line as coming from within you, as if you are the one expressing how lonely you feel. This phenomenon is not only true of lyric poetry but can be applied to a variety of different kinds of sad art (Levinson, 1982; Levinson, 2014). Philosophers have posited that appropriating sad art is what makes sad art enjoyable for a number of reasons which will be discussed in greater depth in Chapter 4 (Levinson; 1982; Ribeiro 2014). However, the ultimate consensus in the philosophy literature is that appropriation gives rise to increased liking of sad art. Hence, if you hear a song about depression and loneliness, appropriating the song and experiencing it as an expression of your own sadness and loneliness may make the experience of listening to this song enjoyable.

My hypothesis builds on the art philosophy literature and suggests that simply conceptualising something art gives you licence to appropriate and enjoy the negative emotions expressed in a way that you cannot in everyday life. To illustrate this, imagine that you're at the coffee shop and someone just walks up to you and says "I feel so alone". Unlike the experience of hearing this in a poem, hearing this expressed in everyday communication might be unpleasant or actually distressing. You would have to think about this person and how sad she is feeling. You cannot appropriate her emotions and experience her sadness as though it is an expression of your own sadness because that would be wrong to do in a normal social situation.

My empirical studies tested whether framing something as art influences liking for the expression of negative emotion. I specifically explore why we enjoy the expression of sadness in art. I also investigated potential reasons that explain why people might enjoy the expression sadness in art but not in not-art contexts.

THE PRESENT STUDIES

The present studies are split into two main projects which correspond with the first and second sections of this thesis. Part I of the thesis builds on the concept of art as an expression of the creator's emotions and the psychological connection that one forms with the artist. Specifically, these studies examine how two different immersive technologies that influence two different sensory modalities can be used to augment measures of psychological connection towards the artist. Chapter 2 will begin by introducing the literature on immersive technologies and their role in generating a sense of social presence, empathy, and other behavioural outcomes with personalities in media such as TV and film. This chapter will also discuss the psychology literature relevant to headphones, a technology commonly used to listen to music that creates a sense of

immersion by isolating the user from the auditory environment. I will then present novel empirical evidence showing that wearing headphones while listening to music can increase sense of empathy, parasocial bond, and loyalty towards the artist. I also empirically investigate a potential mechanistic explanation as to why headphones increase a sense of connection to the artist. Finally, I will discuss the findings and limitations of this study. Chapter 3 discusses how an immersive technology that affects another sensory pathway (touch) can influence the experience of listening to music. I will present empirical evidence that people feel more empathy towards an artist, form stronger parasocial relationships with the artist, and feel greater artist loyalty when listening to a clip of music while receiving haptic feedback versus no haptic feedback. The same mechanistic explanation proposed for the headphones study is also explored as a potential mediator of the relationship between haptics and connection to the artist. The results of the study will be discussed and the limitations of the present study will also be discussed. Finally, this chapter will end with an overview of the findings from both the headphones and haptics studies and discuss scope for further investigation.

Part II of this thesis explores an implication of the differences between art as a means of communication and everyday communication. Specifically, I investigate why people seem to enjoy expressions of sadness in art but not in everyday life. Chapter 4 will begin by introducing the literature on the paradox of sad art and how art differs from communication in everyday life. Chapter 4 consists of five studies. Study 1 explores whether framing the exact same sad text as a work of art versus not-art influences liking for the text. Study 2 investigates the generalizability of these findings across artforms. I then follow up these initial two studies by investigating potential reasons that could explain why people seem to prefer the exact same sad text more when they are told that they are reading a work of art versus not-art. Study 3 investigates if the perceived

fictionality of art accounts for liking of sad art. Study 4 investigates whether liking for sad art can be explained by appropriation. Finally, Study 5 eliminates a potential confound in the study design. I will include a discussion of these findings, limitations, and scope for future research. Chapter 5 will summarise my findings and explore how these novel perspectives contribute to the psychological literature on art and communication and connection between audience and artist. I will discuss general limitations that affect studies in Chapters 2-4 and also explore avenues for future research.

CHAPTER 2: PART I – HEADPHONES TO AUGMENT CONNECTION BETWEEN ARTISTS AND AUDIENCES

Introduction

Access to music is greater than it has ever been in human history. Technological advancements have made it possible for us to discover and access millions of songs and artists of every genre within seconds (Marshall, 2015). Today, people spend an average of 2 hours a day listening to music via streaming services such as Spotify, Apple Music, and Amazon Music (IFPI, 2019).

Due to the ubiquity of on-demand streaming, people spend a significant amount of time listening to recorded music, as opposed to live music (Charron, 2017; Horie, Wada, & Watanabe, 2017). One implication of this is that the interaction with recorded music is always mediated via technology – finding and selecting music involves interacting with a digital streaming service or record player and listening to music requires speakers or headphones (Prior, 2018). We also mainly engage with recorded music via one sensory modality – the auditory modality. While we have access to visual cues in certain contexts, like when watching music videos or viewing digital album art when we search for music on streaming services, we do not have access to cues like the facial expressions, posture, and movement when simply listening to music (Schutz, 2008; Waddell & Williamon, 2017; Venkatesan, Wang, & Spence, 2020). Because listening to recorded music is less perceptually rich than listening to live music for the reasons listed above, people have sought ways to augment the recorded music listening experience.

Over the last decade, there have been major developments in immersive technologies as there has been a general shift in technology from “access and find”, Web 1.0 focused tools to Web 3.0 tools

that encourage “immersive collaboration and co-creation” (Kapp & O’Driscoll, 2010). The goal of immersive environments is to enable the user to experience a computer-generated world “as if it were real” (Bowman & McMahan, 2007). The degree of immersiveness of a technology is the extent to which the technology creates a perceptually rich environment that diminishes the distinction between the mediated environment and reality (Cummings & Bailenson, 2016). Thus, immersive technology has the ability to make the user feel like they have either been transported elsewhere or that the digital personalities are sharing the same space as the user (Harper, 2015; Holt, 2010).

While many immersive technologies have not been specifically designed for augmenting the experience of listening to music, some of these technologies have music specific applications and the music industry has tried to capitalise on this shift in consumer demand towards highly engaging, immersive experiences. Companies like MelodyVR enable users to attend virtual concerts, change their viewing angle, and even “stand” on stage along with the band (Hanley, 2019). Similarly, augmented reality companies like Firststage allow you to superimpose your favourite bands onto any background so, for example, you can watch the band Coldplay perform on your kitchen table (Holden, 2016). Companies like Woojer, Basslet, and SubPac create subwoofer, haptic technologies that enable the user to literally “feel the music” as the devices vibrate in time with the music e.g., vibrating wristbands, chairs, and backpacks (Lofelt, 2019). The companies that make these technologies claim that these immersive devices and formats allow users to have authentic musical experiences that are perceptually rich (Esteves, 2017).

To date, however, very little is understood about the psychological impact and mechanisms by which these technologies influence the music listening experience. Drawing from the literature on

immersive technologies in non-musical contexts, like gaming and media consumption, I theorise and empirically support the notion that these immersive technologies can influence the music listening experience. Specifically, I hypothesize that immersive technologies enhance the sense of psychological connection to artists when used to listen to recorded music, and they do so by generating a sense of social presence.

Social presence

The concept of social presence is one that has emerged from the literature on media psychology and it has been defined as the “degree of salience of the other person in the interaction and the consequent salience of the inter-personal relationships” (Short, Williams, & Christie, 1976). Because presence in mediated environments can mean several different things, the concept is nebulously defined (Biocca et al., 2003; Lee, 2004; Schultze & Brooks, 2016). Numerous terms fall under the umbrella concept of “presence”, including social presence, co-presence, personal presence, and telepresence (Biocca et al., 2003; Lee, 2004). Presence can refer to the psychological sense of “being there” with others in a virtual environment (Biocca, 1997). The “others” in the virtual environment could be people in different physical locations interacting in the virtual environment or fictional avatars (Nowak, 2001; Slater et al., 2000). Presence can also refer to the “psychological connection of minds” and the awareness that one’s behaviour may be monitored by others in a mediated environment (Rettie, 2005). Presence may also be defined as the feeling that an individual in the mediated environment is psycho-emotionally there with you in the real world i.e., the mediated person is sharing the same space as you (Schultze & Brooks, 2016). There is very little consistency among sub-definitions of the concept of presence, however, and researchers tend to disagree on just how many sub-divisions of the concept of presence there are. For example, some researchers conflate social presence with co-presence while others draw a clear

distinction between the two (Nowack, 2001; Schultze & Brooks, 2016). Most researchers agree, however, that presence generally relates to the feeling of social and emotional connection to others in a mediated environment (Kim, Kim & Yang, 2019). People perceive mediated others as real instead of abstract or anonymous and, thus, interaction with mediated others tends to resemble face-to-face interaction (Lombard & Ditton, 1997). For the purpose of this research, I will henceforth refer to social presence as the feeling of social connection to a mediated other and feeling that the mediated other is somehow “there”, sharing the same space as you (Lowenthal & Snelson, 2017; Schultze & Brooks, 2016).

Empirical research suggests that technologies generate a sense of social presence to the extent that they are informationally rich and provide a variety of different kinds of sensory information so as to simulate real environments (Lombard et al., 2000; Shin, Song, Kim & Biocca, 2019). Consider the contrast between communicating with someone via email as opposed to communicating with someone in person. An email lacks nonverbal and relational cues that are intrinsic to face-to-face communication and there is a significant delay in communication (Walther, 1996; Walther, Anderson, & Park, 1994). Now consider speaking to someone on a video conferencing platform like an Instagram live chat. As a video medium, viewers have access to facial expressions and other visual cues that they would normally have in face-to-face interaction. Furthermore, communication via video can often be seamless and in real-time, just like in face-to-face communication. Thus, an Instagram live chat is likely to generate more of a sense of social presence than an email because the properties of the technology enable communication that is more like in-person interaction (Schultze & Brooks, 2016).

The degree of immersion of a technology is contingent on the affordances inherent to the technology. Factors such as display resolution, frame rate, surround sound, and synchrony are user experience factors key to generating a sense of immersion and social presence (Cummings & Bailenson, 2016). For example, the experience of presence while participating in an Instagram live chat technology may vary between users due to factors such as internet speed and pixel definition (Pallavicini & Pepe, 2019). Someone with higher definition streaming quality and faster internet speed may experience a greater sense of social presence while participating in the same Instagram live chat compared to someone with who has lower definition streaming quality and more lag.

Furthermore, in order to generate social presence, one of the key affordances of the technology must be the ability to capture and communicate the emotions of others (Grant, 2016; Janssen et al., 2010; Schultze & Brooks, 2016; Shin, Song, Kim, & Biocca, 2019). Communication of emotion often relies on visual, tactile, and auditory cues about facial expression, posture, tactile pressure, vocal tone, etc. (Banse & Scherer, 1996). There is a correlation between the ability of a technology to capture rich perceptual information and the ability of the user to generate accurate mental models of the situation and characters depicted in a mediated environment (Blanke, 2012). Some technologies, like texts, are informationally impoverished and have a limited capacity to communicate emotional information. Simple modifications, such as the introduction of emoticons in texts, can make an informationally poor technology more informationally rich and thus increase our sense of presence (Derks, Fischer, & Bos, 2008; Janssen et al., 2010). Hence, the affordances of the technology are what generate a sense of social presence – the more immersive/perceptually rich the technology, the greater the feeling of social presence generated in the user (Schultze & Brooks, 2016; Shin, Song, Kim, & Biocca, 2019).

Social presence is often correlated with feelings of social warmth and, as a consequence, it is predictive of positive attitudes and interpersonal intimacy towards others (Jin, 2010; Lee, 2013; Lee & Jang, 2013; Shin et al., 2019). Conversely, because social presence is associated with feelings of increased psychological connection to others, social presence is inversely related to feelings of loneliness (Kim, Kim, & Yang, 2019; Shin et al., 2019).

Immersive technologies and connection

Given that immersive technologies increase social presence and that social presence leads to increased feelings of interpersonal connection as well as decreased loneliness, there is evidence to suggest that immersive technologies increase feelings of interpersonal connection and decrease loneliness *because* they generate a sense of social presence. Indeed, there is research suggesting that perception of social presence mediates the relationship between immersive technology and various measures of intimacy and connection towards mediated others (Jin, 2010; Lee, 2013). The media psychology literature has used a variety of different kinds of measures to study psychological connection, such as self-reported and behavioural measures of cognitive empathy, affective empathy, and parasocial relationship (Barbot & Kaufman, 2020; Bujić et al., 2020; Kandaurova & Lee, 2019; Kim, Kim & Yang, 2019; Laws, 2020; Schutte & Stilinović, 2017).

Research shows that immersive technologies can increase self-reported empathy for mediated others as well as behavioural measures of empathy (e.g., Barbot & Kaufman, 2020; Bujić et al., 2020; Laws, 2020). Studies have found that immersive technologies, like virtual reality, can increase both self-assessment and proxy measures of cognitive empathy, the ability to understand the mental states of others (Carey et al., 2017; Cummings et al., 2021; Gerdes, Segal, & Lietz, 2010; Soliman, Peetz, & Davydenko, 2017). There is also evidence that immersive technology can

increase affective, or “felt” empathy, towards mediated others (Cummings et al., 2021). Additionally, studies show that experiencing news stories via immersive technology influences downstream proxy and behavioural measures of empathy, such as intent to donate, willingness to volunteer time towards social causes, explicit attitudes towards social out-groups, and sense of responsibility and moral obligation towards others (Buić et al., 2020; Kandaurova & Lee, 2019; Rosenberg, Baughman, & Bailenson, 2013; Schutte & Stilić, 2017; Steinfeld, 2020). In fact, charitable and human rights organizations like the United Nations and Amnesty International have been using immersive technologies as a means of generating awareness for social causes and promoting charitable giving (Kandaurova & Lee, 2019).

Research also shows that immersive technologies can facilitate positive parasocial relationships. Parasocial relationships refer to the one-sided relationships that individuals form with fictional or media personalities such as fictional characters, celebrities, politicians, musicians, influencers, etc. (Rubin & Perse, 1987). Parasocial relationships can form through interaction with a range of different kinds of media like films, books, news, social media, etc (Jarzyna, 2020). One predictor of the formation of parasocial relationships is the degree of social presence that the media generates. Technologies that allow for greater perception of social presence also facilitate the formation of parasocial relationships (Blight, Ruppel, & Schoenbauer, 2017; Jarzyna, 2020; Jin & Park, 2009; Kim, Kim, & Yang, 2019). Users of platforms like Twitter and Instagram – platforms which encourage user engagement and have been shown to generate social presence— report positive parasocial interactions with celebrities (Kim, Kim, & Yang, 2019; Kim & Song, 2016). Furthermore, users of highly immersive gaming platforms which incorporate features such as motion sensing technology, haptic feedback, and virtual reality have been shown to form parasocial bonds with fictional avatars (Jin & Park, 2009).

The social compensation model proposed in the media sociological literature suggests that people actively seek online, gaming, and other technology-mediated experiences to compensate for feelings of loneliness (Kraut et al., 2002). Empirical evidence also shows strong correlations between self-reported loneliness and use of technology (Caplan, 2007; Kim, Kim & Yang, 2019; Morahan-Martin & Schumacher, 2003). Research also shows that immersive technology may be used as an intervention to decrease feelings of loneliness in chronically lonely populations such as the elderly (Appel et al., 2020).

Given that music is predominantly an auditory stimulus, immersive technologies that enhance experience of the music listening process are often designed to generate a sense of immersion via the auditory pathway. One of the most commonly used immersive technologies used to listen to music are headphones. The aim of the exploratory research detailed in this chapter is to investigate whether headphones can be used to generate a sense of psychological connection with the artist when used for listening to music and whether feelings of social presence can explain how headphones influence psychological connection.

Auditory immersion as a facilitator of social presence

Headphones are devices used for listening to audio content that can be worn either in the ear with earbud-type devices or around the ear. They can be connected to devices with wires or they can be used wirelessly. Headphones are ubiquitous because they are portable and can personalise the music listening experience (Kallinen & Ravaja, 2007; Zelechowska et al., 2020). They are considered an immersive technology for two main reasons. First, they act as a barrier between the listener and the environment and block out external noises, allowing the listener to feel immersed (Gomes et al., 2020; Kallinen & Ravaja, 2007; Zelechowska et al., 2020). Additionally, headphones

are a proximal source of auditory information and they, thus, decrease sense of psychological distance between the listener and the content they are listening to (Kallinen & Ravaja, 2007).

Research suggests that headphones can impact the music listening experience by influencing the localization of sound, the quality of sound, and the personalization of the music listening experience (e.g., Chen, 2003; Herbert, 2012; Stankievec, 2007). Furthermore, research shows that there is an overall preference for listening auditory content, such as podcasts, via headphones over speakers (Kallinen & Ravaja, 2007; Zelechowska et al., 2020). The research on headphones is scant but a recent study has shown that listening to podcasts on headphones increases feelings of social presence of the speaker, decreases feelings of social distance, and increases positive attitudes towards the speaker (Lieberman, Amir, & Schroeder, 2016). Another study showed that participants felt more immersed and a greater sense of engagement when playing a video game while wearing headphones (Iveson, 2018). Qualitative data collected in this study indicated that a central motivation for wearing headphones was to feel immersed and more focused. Participants made statements such as, “I play to be taken away from my current soundings and to be swept by the stories and worlds that these companies create” and “It allows me to become more immersed when playing a story-driven single-player game” (Iveson, 2018: 49). Another study showed that headphones increased immersion when used along with the Google Cardboard 360 video device but did not increase immersion when watching 360 videos on the Magic Window Device (Tse et al., 2017). The authors explained this unexpected discrepancy in reported immersion between the two devices, however, as potentially relating to idiosyncrasies specific to the 360 video viewing devices rather than the headphones themselves. Overall, evidence suggests that people prefer listening to content on headphones over speakers and there is some evidence that headphones

can generate a sense of social presence, influencing attitudes towards mediated individuals (as discussed in Liberman, Amir, & Schroeder, 2016).

The present study

The present study builds on the media psychology literature on immersive technologies and investigates the impact of headphones on the music listening experience. An exploratory study investigated whether listening to music with vocals while wearing headphones increased sense of psychological connection towards the singer (henceforth referred to as the “artist”). Specifically, I investigated whether listening to music with headphones influenced feelings of empathy, parasocial bond, and loyalty towards the artist. I also predicted that participants in the immersive condition would report decreased feelings of loneliness. Finally, I hypothesized that social presence would mediate the relationship between headphones and feelings of empathy towards the artist, parasocial bond with the artist, artist loyalty, and loneliness.

NB: A follow up study to the one described in this chapter was supposed to be conducted in the autumn of 2020/spring 2021. Due to the COVID-19 pandemic, however, I was unable to run the planned follow up studies. Plans for the design and follow up analyses are detailed in the discussion section of this study.

Headphones Study

This study investigated if listening to music with headphones versus speakers influences empathy, loyalty, and parasocial bond with the artist. Participants were randomly assigned to one of two conditions (speakers vs. headphones) in a between-subjects design. Participants listened to the same song on either headphones or speakers and answered questions about their sense of psychological connection to the artist. I hypothesized a main effect of headphones condition on empathy, loyalty, and parasocial bond such that people in the headphones condition would report higher scores on these three measures when listening to music than people in the speaker condition. I also hypothesized a mean effect of headphones condition on feelings of loneliness in the listeners such that participants would report feeling less lonely in the headphones condition compared to the speaker condition. I further predicted that perception of social presence would mediate the effect of headphones condition on all four dependent variables.

Methods

Participants. Eighty participants (63.5% Female, $M_{age} = 23.99$, $SD_{age} = 5.8$) from the city of Oxford participated in this study for payment of £5. Participants were told that they would be asked to listen to music and answer several questions about the music and about their personality. Participants were also pre-screened and were asked to only register for the study if they had normal hearing. This study received CUREC ethical approval (reference number: R66945/RE001).

Procedure

Participants were randomly assigned to one of two experimental conditions (headphones and speakers) in a between-subjects design. They were given a set of headphones and asked to listen to a song on loop for the duration of the study. The headphones were worn over the ear and covered the whole ear. Audio levels were balanced across the two conditions by using an app called Decibel X: dB Sound Level Metre downloaded from the iOS app store. The audio levels were set at 72db for both the headphones and speaker condition and the speakers were located exactly 14 feet away from each participant (Kallinen & Ravaja, 2004). The speaker used was the Bose SoundLink Mini II and the headphones used were the Sony MDR-ZX110 Overhead Headphones. The study was conducted in a computer lab in the Anna Watts Building and was sound proofed from outside noise.

All participants listened to the song, *She Used to Be Mine* by Jessie Müller. It is a musical theatre song that contains female vocals and was taken from a Spotify playlist titled, “Emotional Songs”. This song was chosen because it is sad and emotional and was, therefore, likely to generate a feeling of empathy in the listener (Eerola, Vuoskoski, & Kautiainen, 2016).

Before beginning the study, participants were asked to listen to the song for 30 seconds and asked to answer some questions about clarity, quality, loudness, quietness, and subjective evaluations of the music to ensure that there were no significant differences between the two conditions. They were also asked a binary choice question about whether they were familiar with the song used in this experiment.

Measures. After 30 seconds, the study began by asking participants a series of questions presented in a randomised order. To assess cognitive empathy towards the artist, participants were asked to

respond to items adapted from the Ad Response Empathy Scale used to assess empathy in response to media (Escalas & Stern, 2003). Participants responded to a set of four statements about *Empathy for Artist* ($\alpha = .92$) on 7-point Likert scales ranging from *strongly disagree* to *strongly agree*: (1) *I understood what the singer was feeling*, (2) *I understood the singer's point of view*, (3) *While listening to the music, I tried to understand the singer's motivations*, and (4) *I was able to recognise the issues that the singer was singing about*.

To assess the *Parasocial Relationship* ($\alpha = 0.89$) with the artist, participants were asked to respond to eight statements adapted from the Celebrity Parasocial Interaction Scale (Hartmann, 2008; Rubin & Perse, 1987). Participants responded to the following statements on -point Likert scales ranging from *strongly disagree* to *strongly agree*: (1) *When this singer sings about how they are feeling, it helps me understand my own feelings*, (2) *I would feel sorry for this singer if they made a mistake*, (3) *Listening to this singer makes me feel comfortable, as if I am with friends*, (4) *I see this singer as a natural, down-to-earth person*, (5) *I would look forward to hearing news about this singer*, (6) *I find this singer likeable*, (7) *I would like to meet this singer in person*, and (8) *When I listen to this singer, I feel as if I'm a part of their group*.

Artist Loyalty ($\alpha = 0.90$) was measured based on a set of items adapted from a study on loyalty towards musicians (Huang & Phau, 2015). Participants indicated their responses to the following three items on 7-point Likert scales ranging from *strongly disagree* to *strongly agree*: (1) *When I want to listen to music, I would feel safer listening to more music by this singer than trying to listen to a new singer*, (2) *Even though there are many other artists releasing new music, I would feel inclined to listen to music by this singer because I really like them*, and (3) *I plan on listening to new music released by this artist*.

Loneliness ($\alpha = .96$) was also measured because research on immersive technologies suggests that an increased sense of social presence of avatars or figures in virtual environments may also decrease feelings of isolation (Liszio, Emmerich, & Masuch, 2017). Participants responded to the following three items on 7-point Likert scales ranging from strongly disagree to strongly agree: (1) *I feel a bit lonely*, (2) *I feel quite isolated from others*, and (3) *I feel like I lack companionship* (Hadi & Valenzuela, 2014).

Perception of Social Presence ($\alpha = 0.95$) of the artist was measured by a set of items adapted from research on immersive reality (Nowak, 2001; Nowak & Biocca, 2003). Participants indicated their responses to the following five items on 7-point Likert scales ranging from *strongly disagree* to *strongly agree*: (1) *I feel connected to this singer*, (2) *I feel like the singer is here with me*, (3) *I feel like there is a bond between this singer and myself*, (4) *I feel close to this singer*, and (5) *I feel involved with this singer*.

Additional variables were collected for exploratory analyses but, as they were not central to the investigation, they were not included in the main analysis (see Appendix A for list of all other items collected in this study). Two attention checks were embedded in the study which are detailed in Appendix A. Finally, participants were asked some demographic questions (age, gender) and a suspicion probe question. The total study duration was approximately 15 minutes.

Results

Two participants were excluded for failing either of the attention checks, failing to answer all of the questions in the survey, or indicating their familiarity with the music used in the study. Additionally, four participants were excluded due to their familiarity with the song. The following analyses were conducted on the remaining seventy-four participants. Analyses of Variance (ANOVAs) were conducted on all variables to check for significant main effects as per journal conditions. All conditions for the ANOVA were met.

Empathy for Artist. An ANOVA determined that there was a significant effect of listening condition such that participants in the headphones condition reported a higher Empathy for Artist Score ($M = 5.80, SE = .22$) than in the speaker condition ($M = 4.32, SE = .22$); $F(1,72) = 23.05, p < .001, \eta_p^2 = .242$. See Figure 1.1 for mean ratings of Empathy for Artist Score by headphones condition.

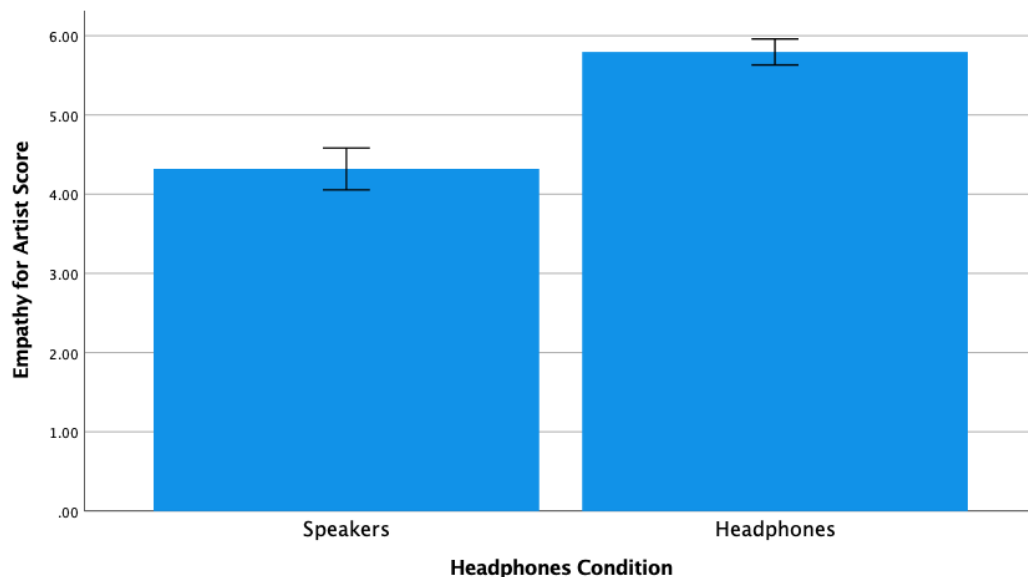


Figure 1.1: Mean ratings of Empathy for Artist by headphones condition. Error bars show ± 1 standard error.

Parasocial relationship with artist. An ANOVA with listening condition as the between-subjects factor revealed a significant effect on *Parasocial Relationship* scores. Participants in the headphones condition felt a stronger parasocial relationship with the singer ($M = 5.04, SE = .19$) than in the speaker condition ($M = 3.87, SE = .20$); $F(1,72) = 17.55, p < .001, \eta_p^2 = .196$. See Figure 1.2 for mean ratings of Parasocial Relationship Score by headphones condition.

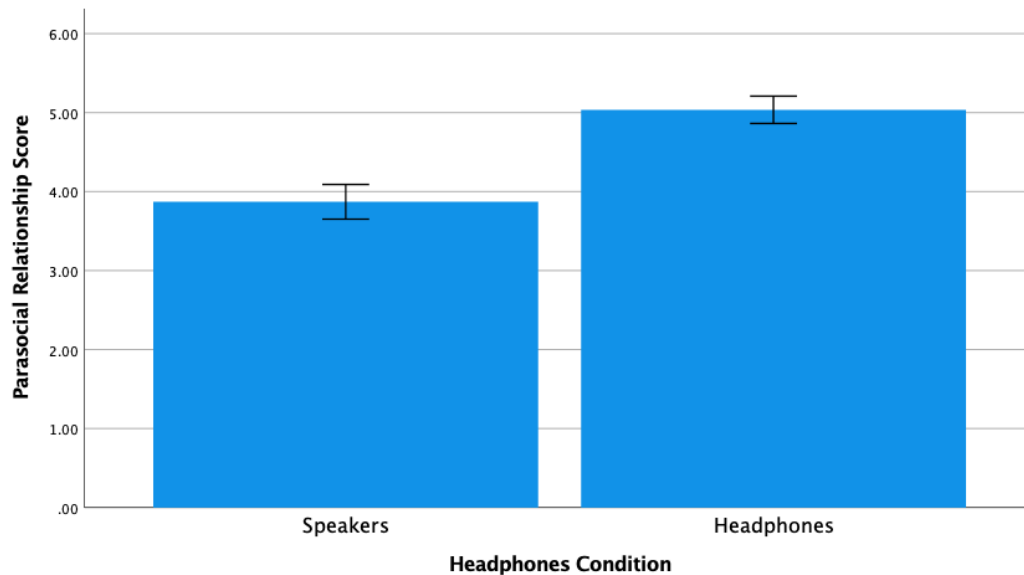


Figure 1.2: Mean ratings of Parasocial Relationship by headphones condition. Error bars show ± 1 standard error.

Artist Loyalty. An ANOVA indicated that there was a significant effect of listening condition on Artist Loyalty scores with participants in the headphones condition reporting greater Artist Loyalty scores ($M = 5.61, SE = .30$) than participants in the speaker condition ($M = 3.94, SE = .31$); $F(1, 72) = 14.82, p < .001, \eta_p^2 = .171$. See Figure 1.3 for mean ratings of Artist Loyalty Score by headphones condition.

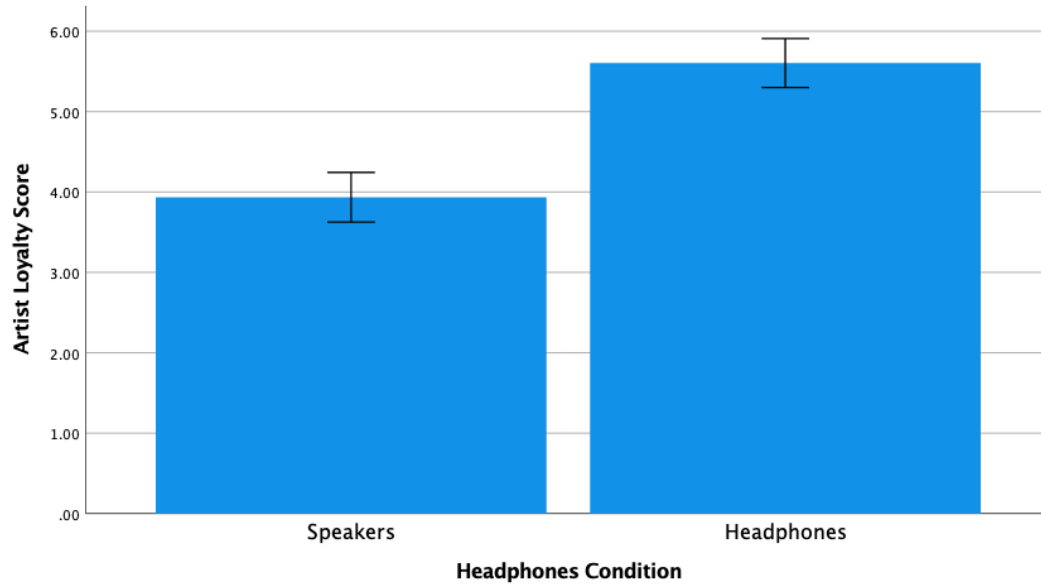


Figure 1.3: Mean ratings of Artist Loyalty Score by headphones condition. Error bars show ± 1 standard error.

Loneliness. An ANOVA with listening condition as the between-subjects factor revealed a significant effect on *Loneliness* scores. Participants in the headphones condition reported lower Loneliness Scores ($M = 2.67$, $SE = .31$) than participants in the speaker condition ($M = 4.14$, $SE = .32$); $F(1,72) = 11.10$, $p = .001$, $\eta_p^2 = .134$. See Figure 1.4 for mean ratings of Loneliness Score by headphones condition.

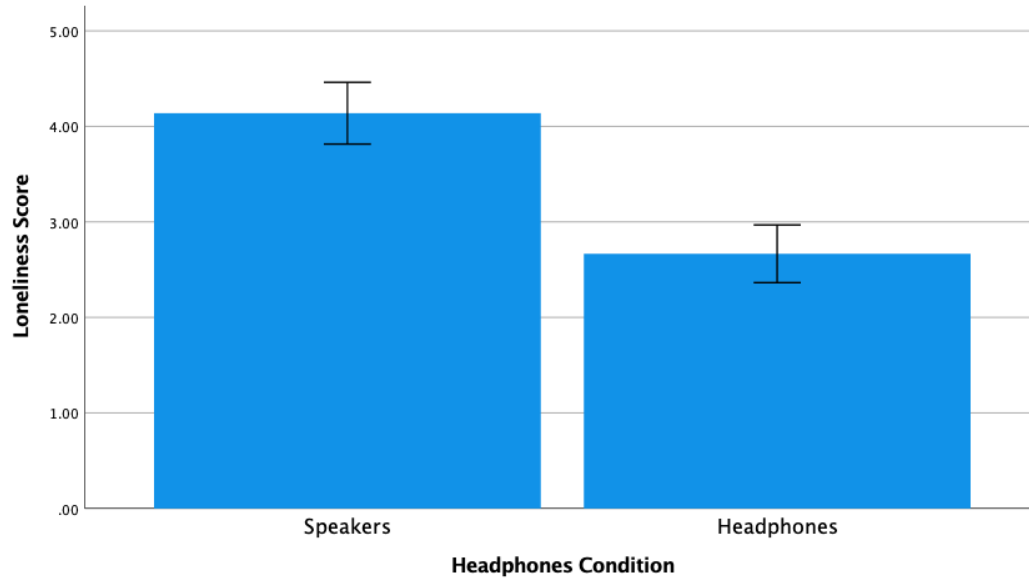


Figure 1.4: Mean ratings of Loneliness Score by headphones condition. Error bars show ± 1 standard error.

Ancillary measures. Participants did not perceive any significant differences in clarity ($p = .947$), quality ($p = .788$), or quietness ($p = .966$) between the headphones and speaker conditions. Furthermore, the six items measuring music evaluation formed a reliable scale ($\alpha = .78$) and hence they were combined into a single composite measure. An ANOVA determined that there were no significant differences in people's evaluations of the music between the two listening conditions ($p = .542$). None of the participants guessed the purpose of the study in the suspicion probe question.

There was, however, a significant difference in perceived loudness and pairwise comparisons indicated that participants perceived the volume to be louder in the headphones condition ($M = 2.84$, $SE = .24$) compared to participants in the speaker condition ($M = 1.94$, $SE = .24$); $F(1,72) = 7.01$, $p = .010$, $\eta_p^2 = .089$. The effect size was relatively small, however, given that audio levels

were balanced using an audio metre. Implications of perceived differences in volume will be discussed in the discussion section.

Based on the immersive technology psychology literature, social presence was identified as a potential mediator of the effect of headphones condition on Empathy for Artist Score, Parasocial Relationship Score, Artist Loyalty Score, and Loneliness. A reliability analysis indicated that the five items measuring social presence formed a reliable scale ($\alpha = 0.93$) and hence they were combined into a single *Social Presence Score*. An ANOVA determined that there was a statistically significant effect of listening condition such that participants in the headphones condition felt a greater sense of social presence of the singer ($M = 5.06, SE = .25$) than in the speaker condition ($M = 3.48, SE = .26$); $F(1, 72) = 19.71, p < .001, \eta_p^2 = .215$. See Figure 1.5 for mean ratings of Social Presence Score by headphones condition.

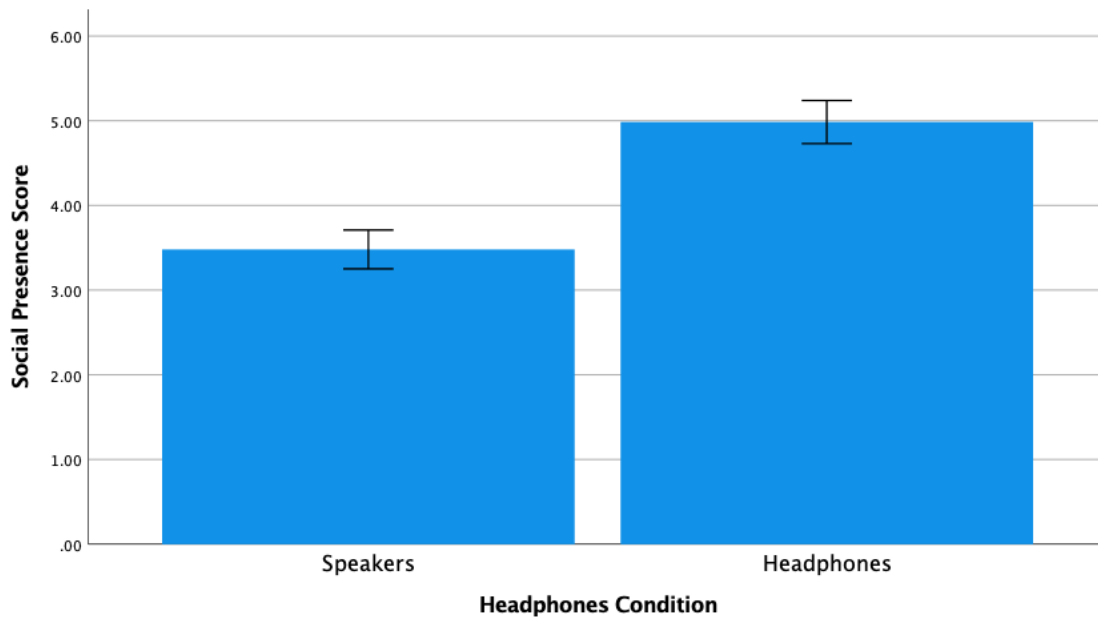


Figure 1.5: Mean ratings of Social Presence Score by headphones condition. Error bars show +/- 1 standard error.

To test for social presence as a mediator of the effects of headphones condition on the four dependent variables, mediation analyses were conducted using model 4 in PROCESS SPSS Macro (Hayes, 2017). The confidence interval was set to 95% and the number of bootstraps was set to 10,000 (Hayes 2017; Preacher & Hayes, 2004). Headphones condition was coded as 1 = headphones, 0 = speakers.

The bootstrap analysis indicated that social presence was, indeed, a significant mediator of headphones condition and Empathy for Artist Score, $\beta = .79$, $SE = .22$, 95% CI = [.39 – 1.28]. Social presence also mediates the relationship between headphones condition and Parasocial Relationship Score, $\beta = .94$, $SE = .23$, 95% CI = [.52 – 1.42]. Social presence also mediated the relationship between headphones condition and Artist Loyalty Score, $\beta = 1.34$, $SE = .36$, 95% CI = [.69 – 2.11]. The relationship between headphones condition and Loneliness Score with social presence as a mediator was also significant, $\beta = -.72$, $SE = .29$, 95% CI = [-1.37 – -.24]. Table 1 presents the direct effects of the pathway analyses and Table 2 presents the indirect effects of the pathway analysis.

Table 1: Direct effects of mediation analysis of Headphones Condition on Empathy for Artist Score, Parasocial Relationship Score, Artist Loyalty Score, and Loneliness Score, with Social Presence Score as a mediator.

	β	<i>SE</i>	95% CI	<i>p</i>
Empathy for Artist Score	.68	.28	.12 – 1.25	.02
Parasocial Relationship Score	.22	.20	-.18 – .63	.28
Artist Loyalty Score	.33	.35	-.38 – 1.03	.36
Loneliness Score	-.75	.46	-1.69 – .18	.11

Table 2: Indirect effects of mediation analysis of Headphones Condition on Empathy for Artist Score, Parasocial Relationship Score, Artist Loyalty Score, and Loneliness Score, with Social Presence Score as a mediator.

	β	<i>SE</i>	95% CI
Empathy for Artist Score	.79	.22	.39 – 1.28
Parasocial Relationship Score	.94	.23	.52 – 1.42
Artist Loyalty Score	1.34	.36	.69 – 2.11
Loneliness Score	-.72	.29	-1.37 – -.24

Social Presence Score mediates the effect of headphones condition on Empathy for Artist Score, Parasocial Relationship Score, Artist Loyalty Score, and Loneliness Score. There was only one significant direct effect of headphones condition on Empathy for Artist Score when controlling for Social Presence Score (95% CI= .12 – 1.25) which suggests that social presence at least partially

mediates this relationship. There were no other significant direct effects, suggesting that Social Presence Score fully mediates the relationship of headphones condition on Parasocial Relationship Score (95% CI = $-.18 - .63$), Artist Loyalty Score (95% CI = $-.38 - 1.03$), and Loneliness Score (95% CI = $-1.69 - .18$).

Because there was an unexpected effect of condition on perceived loudness, I conducted an exploratory mediation analyses with the following pathway design: headphones condition → perceived loudness → Empathy for Artist Score/ Parasocial Relationship Score, Artist Loyalty Score/Loneliness Score, to rule out the possibility that the difference in perceived loudness is actually what explains the main effects.

To test a mediation model with perceived loudness as a mediator of the effect of headphones condition on the four dependent variables, the mediation analyses were conducted using model 4 in PROCESS SPSS Macro (Hayes, 2017). In this study, the confidence interval was set to 95% and the number of bootstraps was set to 10,000 (Hayes 2017; Preacher & Hayes, 2004). Headphones condition was coded as 1 = headphones, 0 = speakers.

The bootstrap analysis indicated that there were no significant direct or indirect effects of headphones condition on any of the dependent variables ($p > .05$ and 95% CI included 0). This suggests that perceived loudness does not mediate the relationship between headphones condition and Empathy for Artist, Parasocial relationship, Artist Loyalty, or Loneliness.

Discussion

As predicted, the results show that listening to music with headphones increases empathy, loyalty, and parasocial bond with the artist as opposed to listening to music with speakers. Results also indicate that listening to music with headphones decreases loneliness. I also found the hypothesized main effect of headphones condition on these variables was mediated by feelings of social presence of the artist. These results indicate that headphones generate a feeling that the artist is “there” with you and that this in turn influences various measures of psychological connection to the artist and their music. Social presence of the artist fully mediates the relationship between headphones condition and artist loyalty, parasocial bond, and loneliness, indicating that it completely explains the main effects. Social presence only partially mediates the relationship between headphones condition and empathy for the artist, suggesting that there might be an additional mechanism by which headphones increase feelings of empathy towards the artist.

In the following section, I will detail a list of the limitations of the present study and outline some of the changes I had planned on making for the follow-up study, which I was unable to run due to the COVID-19 pandemic.

Music Stimulus

In the current study, participants all heard the same song about sadness with female vocals. This is potentially problematic because it is unclear just how generalizable these findings are. In the planned follow-up study, I would have selected 5 songs of a variety of different genres with a mix of male and female vocalists. The songs would have been pre-tested to ensure that the songs were not extremely emotional/unemotional to ensure that there are no ceiling or floor effects due to stimuli choice. The songs would then be treated as a random factor and the headphones condition would have been treated as the fixed factor in a linear mixed effects model regression analysis.

Difference in Perceived Loudness

There was an unanticipated effect of headphones condition on perceived loudness of the music even though an audio level metre was used to equalize volume across conditions. Upon further investigation, it appears this result is consistent with previous research showing that perceived loudness often doesn't correspond with the equal sound pressure levels at the ear drum due to extraneous factors such as room acoustics (Kohnen et al., 2019). Hence, it is possible that the large room may have made participants feel that the sound was softer in the speaker condition than in the headphones condition. Future studies may wish to use artificial ears instead of audio level metres as they are a more reliable means of controlling for audio levels across conditions (Zelechowska et al., 2020). The results of the mediation analysis indicated, however, that perceived loudness did not mediate the relationship between haptic condition and any of the dependent variables. This suggests that, while there was a difference in perceived loudness between the headphones and speaker conditions, this difference does not explain the main effects found.

Potential confound - Lower level explanations

There is, however, a possibility that perceived loudness might be confounded with another variable - perception of psychological distance. Perception of psychological distance may, in turn, have mediated the main effect of headphones on the dependent variables. While the mediation analysis indicated that perceived loudness was not a significant mediator of the direct effect of headphones on any of the four dependent variables, it is possible that perceived loudness may have influenced perception of psychological distance, which in turn influenced feelings of social presence (Kohnen et al., 2019). That said, the effect sizes in these studies were relatively high.

While it is possible that these more parsimonious stimulus intensity explanations may account for some of the effect, it is unlikely that they account for all of it.

Self-reported measures

All of the current measures are self-reported, and it would be prudent to measure physiological data. Studies on music show that self-reported and physiological data can sometimes diverge and that self-reported answers may not always reflect the full, nuanced processes that underlie how people respond to music (Ellis & Simons, 2005; Richardson et al., 2020). While I did not make specific predictions, I intended to collect exploratory physiological data in a follow-up study to analyse in conjunction with the self-reported measures. Based on previous research on music, I intended to collect data on heart rate, electrodermal activity, and body temperature (Richardson et al., 2020; Turchet, West & Wanderley, 2020). I had planned on collecting all of this physiological data with the same device - the E4 wristband by Empatica, a non-invasive, unobtrusive tool used for collection of multiple physiological measures in real-time (see Milstein & Gordon, 2020 for a review of strengths and limitations of the E4 wristband). This data would have then been compared with the self-reported measures to check for consistency. It should be noted, however, that the primary objective of this study was to assess emotional connection to the artist and physiological data does not entirely captures this information.

While there are some limitations to this preliminary study, the results were indicative of an effect of headphones on three measures of psychological connection to the artist and feelings of loneliness. I also identified a potential mechanism that explains these effects – feelings of social presence mediated the main effect of headphones on empathy, parasocial relationship, and loyalty towards the artist as well as decreased feelings of loneliness in the listener. The next chapter

explores how another immersive technology might impact the music listening experience by influencing another sensory pathway – the tactile modality. I will explore if haptic feedback similarly influences psychological connection to the artist and whether the same mechanism found in this headphones study, social presence, applies to haptic wearable devices. The section titled, “Conclusions of Chapter 2 & 3” discusses the conclusions of both of these studies and discusses scope for future research.

CHAPTER 3: PART I – HAPTIC DEVICES TO AUGMENT CONNECTION BETWEEN ARTISTS AND AUDIENCES

Introduction

In the previous chapter, I discussed the literature on immersive technologies, social presence, and various measures of psychological connection. Specifically, I discussed how headphones increase sense of psychological connection to others and decrease feelings of loneliness because they generate a sense of social presence. Headphones work by creating a sense of immersion by allowing the listener to isolate themselves from the real-world environment and immerse themselves in the auditory information being transmitted via headphones. In sum, I explored how an immersive technology that influences the auditory pathway can influence the music listening experience.

Sound, however, is a multi-modal phenomenon as it can be experienced as both sound and as vibrations (Trivedi, Alqasemi, & Dubey, 2019). Sound is usually experienced through the ear drums but certain frequencies of sound, specifically lower frequencies, can be felt in the body (Hove, Martinez & Stupacher, 2020). There is evidence that listening to loud music with high-level low-frequency sounds, like electronic dance music, can stimulate a vestibular response (Todd & Cody, 2000; Todd, Rosengre, & Colebatch, 2008). Furthermore, high-level low-frequency pure tones can cause human body surface vibration which can be felt in the chest and the abdomen (Takahashi et al., 2005). It is therefore worth investigating whether immersive technologies that provide feedback via the tactile modality can also influence the music listening experience. Haptic devices are immersive technologies which could potentially influence the music listening experience through an alternative modality by generating a sense of immersion via tactile feedback.

Haptic technologies have become ubiquitous today and are commonly found in mobile phone devices which vibrate to signal alerts, such as when you receive a text message or an email (Mazzoni & Bryan-Kinns, 2015). Haptic wearables are devices that pick up on low frequency sounds from an audio input and translate the sound into tactile vibrations (Turchet, West, & Wanderly, 2020). These devices are most commonly used for immersive gaming experiences but can also be used when watching movies or listening to music. A variety of different haptic devices have been created for the purpose of listening to music, specifically to enable the hearing impaired to “feel” the music (Nanayakkara et al., 2013). There is also evidence from the multi-sensory literature that haptic devices can influence perception of music and sound (e.g., Mazzoni & Bryan-Kinns, 2015; Mellis & Tichenor, 2005). In this chapter, I will discuss the multisensory literature on how haptics can influence perception of music and extend this literature by investigating whether haptic wearable devices may be used to augment sense of connection to the artist when worn while listening to music.

Multisensory research on haptics and sound

Multisensory research suggests that people make non-arbitrary associations between sensory stimuli across sensory modalities (Spence, 2011). There is some initial evidence that people make associations between tactile feedback and sound. For example, studies have shown that people associate certain kinds of tactile movement with pitch e.g., upward arm movements with higher pitches and downward arm motions with lower pitches (Deroy et al., 2013; Deroy et al., 2016). There is, however, debate as to the generalizability of these findings as these multimodal associations were only found in sighted and not blind participants (Deroy et al., 2016).

Additionally, there are significant differences in associations between pitch height and spatial height across cultures (Eitan & Timmers, 2010).

Research also indicates that people make metaphoric associations between pitch and tactile words; higher pitches were rated as significantly sharper, rougher, harder, colder, drier, and lighter than lower pitches (Eitan & Rothschild, 2010). There is also some inconclusive research on associations between loudness and texture – some studies show that louder sounds are associated with rougher textures while other studies have shown that loudness is associated with smoothness (see Eitan & Rothschild, 2010 for discussion of these results).

Not only do people make tactile-auditory associations, there is evidence that tactile perceptions can actually influence auditory perception. Tactile stimuli can enhance perception of sound, as one study showed that vibrotactile feedback enhanced perception of faint tones (Gescheider & Niblette, 1967). Psychophysiological studies have shown that vibrotactile cues can facilitate with discrimination of pitch, loudness, and timbre (Russo, Ammirante, & Fels, 2012; Verillo & Gescheider, 1975). Furthermore, another study showed that vibrotactile feedback can improve performance on pitch discrimination tasks – people are better able to detect pitch changes when the auditory stimulus is accompanied with vibrotactile feedback (Young, Murphy, & Weeter, 2016). Tactile feedback has been shown to enhance auditory processing and improve response speed in perceptual tasks (Schürmann et al., 2004). This study asked participants to match faint tones by adjusting a knob until it sounded the same as the reference tone. The study found that participants that were touching a tube that vibrated at the same frequency of the target tone were able to identify the target tone with greater accuracy and speed than participants who did not receive tactile feedback.

It has been suggested that the association between tactile information and auditory information may be due to common neural pathways that process both auditory and tactile information, or a common network that processes both auditory and tactile information (Wilson, Reed, & Braida, 2010). As evidence for this hypothesis, research shows that providing both auditory and tactile cues improve performance on objective detection tasks (Wilson, Reed, & Braida, 2010). Additionally, people treat tactile and auditory cues as being generated from the same stimulus when they are synchronous, such as when tapping corresponds with auditory clicks, and this improves task performance fluency (Bresciani et al., 2005). This multisensory literature helps establish that sound and haptic pulses are clearly linked and that haptic feedback can actually influence sound perception.

More directly relevant to the present study is the research in the field of human-computer interactions. Work on digital instrument design suggests that haptic interfaces are a crucial part of how musicians interact with their instruments and that haptic feedback can actually influence how musicians play (Imschloss & Kuehnl, 2019; Mazzoni & Bryan-Kinns, 2015; Mellis & Tichenor, 2005; Turchet, West, & Wanderley, 2020). Most musical instruments provide some kind of tactile feedback, like the feel of strings on a violin or the feel of keys on a piano, and this haptic engagement is a key aspect of how instrumentalists control performance, expressivity, and user experience (Papetti & Saitis, 2018). When a musician receives haptic feedback from the instrument, the musician can adjust the way they play in order to e.g., convey a specific emotion or stay in time with the music (Young, Murphy, & Weeter, 2016). Because haptic feedback is such an integral component of playing instruments, computer scientists have tried to replicate similar touch-mediated interaction when designing digital musical instruments (Montag et al., 2011;

Turchet, West, & Wanderley, 2020). A major challenge to designing prototypes is that computer scientists cannot design better haptic enabled instruments without understanding the psychophysiological issues of how haptic cues affect performance accuracy in rhythm, intonation, dynamics, and the role of haptics in perception of instrument quality for musicians and performance quality for listeners (Papetti & Saitis, 2018). There has been some initial work in this domain. For example, one study found that using haptic wearables while performing increases cohesion and accuracy in ensemble performance of electronic music (Turchet & Barthet, 2019). Another study found that force feedback allows musicians to alter timbre of electronic instruments so that they sound more like real instruments (Berdahl et al., 2018). Additionally, haptics pulses can help musicians coordinate limb movement so as to help with learning, modification, and coordination of rhythmic sequences (Holland, Bouwer, & Hödle, 2018). This body of research suggests that haptic feedback is a fundamental part of making music – it can influence musician’s perceptions of sound and, therefore, how they play.

There is also evidence that haptics can influence the experience of the listener. Research on haptic augmentation of audio-visual experiences suggests that haptics play an important role in communicating emotional information and this, in turn, influences perceptions of film and music in film. For example, one study designed a haptic wearable called the Mood Glove, a glove with haptic sensors on the fingertips which provided vibrotactile feedback that was coordinated to vibrate at different frequencies based on the emotions expressed in the film soundtrack (Mazzoni & Bryan-Kinns, 2015). This study found that haptic intensity correlated with increased salience of specific emotions while watching a film. Low vibrotactile intensity increased perception of calmness while high intensity vibrotactile feedback increased perception of excitement in the film clip. Another research team designed a haptic jacket which vibrated at different frequencies and

intensities to mimic the emotions of the main character in a film e.g., using haptic simulations of shivers down the spine to invoke a sense of fear (Lemmens et al., 2009). Both of Mazzoni & Bryan-Kinns (2015) and Lemmens et al., (2009) designed haptic devices to amplify the mood music in film and found that specific kinds of haptic vibrations invoked certain emotions in the user and augmented their experience of audio-visual stimuli.

This body of work on multisensory influences of haptics on sound is relevant because it demonstrates that input in one sensory modality can influence experience in another sensory modality. It shows that touch and sound relate to one another because there may be underlying neural processes and/or pathways which may be common to both senses. It also shows that haptics influences sound perception of pitch, rhythm, and timbre and this can influence how musicians play. Finally, it shows that haptics can convey emotional information and influence perception and augment emotional intensity of audio-visual experiences. This last line of work is especially relevant to my research as it shows that haptics can enhance the emotional experience of media content. Haptics may, therefore, also help facilitate a sense of psychological connection with mediated others because it increases the salience of their emotions. I will build on this multisensory work by investigating whether haptic wearable devices can influence sense of connection to the artist when worn while listening to music.

Haptics as a facilitator of social presence

Haptic devices are slightly different from headphones in that they do not create a sense of immersion by isolating the user from their environment. Instead, haptic devices are considered immersive because they help simulate real-life experiences where sound is also experienced

physically e.g., when you can both hear and feel the bass frequencies of the music when attending a concert (Hove, Martinez, & Stupacher, 2020).

It has been suggested that haptic devices generate a sense of immersion and social presence because they manipulate the user's sense of psychological distance to a mediated other and the vibrotactile feedback from haptic devices tends to mimic human-to-human contact (Hadi & Valenzuela, 2014). Vibrotactile feedback is known to be informationally rich in social contexts, delivering cues about emotions and intentions much like in face-to-face interactions (Mazzoni & Bryan-Kinns, 2015; Mellis & Tichenor, 2005; Smith & MacLean, 2007). Research suggests that haptic technologies can enable the user to experience “mediated social touch” because the haptic feedback increases the salience of others and, therefore, perception of social presence (Baecker et al., 2014; Basdogan et al., 2000; Chang & Sullivan, 2005; Haans, Bruijn, & Ijsselsteijn, 2014; Sallnäs, 2010; Rassmus-Gröhn, & Sjöström, 2000). People report feeling that mediated others and digital avatars are “there” when interacting in environments with haptic feedback (Basdogan et al., 2000; Sallnäs, 2010). People also use different types of touch when interacting with human versus nonhuman objects in digital spaces e.g., exerting different haptic pressure when touching a human versus picking up a cup (Bailenson & Yee, 2008). This indicates that haptic feedback is an important part of digital social interaction and that haptic feedback has the ability to convey social information in mediated environments.

Haptics and psychological connection

Nonintimate physical signals are an important part of socialization that can convey positive impressions about people and improve mood (Burgoon & Hoobler, 2002; Crusco & Wurtzel, 1984; Williams & Kleinke, 1993). People similarly form positive evaluations of others and self-

report increased positive mood when using haptic devices (Banks, Westerman, & Sharabi, 2017). One study investigating behavioural measures of loneliness found that translating a social partner's heartbeat into haptic feedback felt on the skin increased intimacy seeking behaviours, such as standing closer to the social partner (Janssen et al., 2010). Haptic feedback has been shown to increase perception of togetherness and collaborative task performance (Bailenson & Yee, 2008; Lee & Kim, 2008; Sallnäs, 2010). Furthermore, a study that compared haptic feedback and visual feedback in a virtual game of football found that participants demonstrated greater trust among virtual teammates with haptic feedback as opposed to visual feedback (Brave et al., 1998). Conversely, people report decreased feelings of loneliness when engaging with haptic devices (Fumagalli, Lee, & Shrum, 2019). Haptic devices significantly decrease feelings of loneliness to the extent that they have been recommended as a potential intervention to reduce feelings of isolation in chronically lonely populations such as the elderly (Appel et al., 2020).

Application of haptics in art experiences

Initial evidence suggests that haptics may influence and augment art experiences. Recent field studies have showed that people enjoy tactile experiences of visual artwork (Faustino et al., 2017; Szubielska & Niestorowicz, 2020; Vi et al., 2017). Participants in a study conducted at the Tate Britain gallery in London reported greater sense of immersion when experiencing art with mid-art haptic feedback (Vi et al., 2017). Another paper argued that haptic enhancements for the visually impaired increased opportunity for learning and increased enjoyment of learning for visitors at a museum exhibit (Davidson et al., 1991). A paper on immersive human-computer interactions detailed a prototype design for a product called SensArt, a device that produces music, haptic vibrations, and temperature changes to translate the emotive qualities of visual art (Faustino et al., 2017). While this was not an empirical study, the intent of the designers was to create an immersive

technology to accompany visual artworks in order to increase audience connection with the art. Overall, however, there is a dearth of research on the effects of haptics on art experiences, such as the music listening experience.

The present study

This study investigated an immersive technology that influenced the tactile sensory modality influences the music listening experience. Specifically, I investigated whether haptic feedback versus no haptic feedback influences feelings of empathy, parasocial bond, and loyalty towards the artist. The hypothesis was that participants in the haptic condition would report a greater sense of empathy, parasocial bond, and loyalty towards the artist.

NB: As with the previous chapter, a follow up study to the one described in this chapter was supposed to be conducted in the autumn of 2020/spring 2021. Due to the COVID-19 pandemic, however, I was unable to run the planned follow up studies. Plans for the design and follow up analyses are detailed in the discussion section of this study.

Haptic Wearable Device Study

This study investigated if listening to music with haptic feedback influences empathy, loyalty, and parasocial bond with the artist. I tested this by randomly assigning participants into two conditions (haptics vs. control) in a between-subjects design. Participants in both conditions wore a wristband on their arm which was turned on and vibrated in time to the music in the experimental condition and turned off and did not vibrate in the control condition. I hypothesized a main effect of haptics condition on empathy, loyalty, and parasocial bond such that people in the haptics condition would report higher scores on these three measures when listening to music than people in the no-haptics, control condition. I further collected data on perceived social presence and predicted that perception of social presence would mediate the effect of haptics condition on these three dependent variables.

Methods

Participants. Eighty participants (64.1% Female, $M_{age} = 23.88$, $SD_{age} = 5.7$) from the city of Oxford participated in this study for payment of £5. Participants were told that they would be asked to listen to music and answer several questions about the music and about their personality. I received ethical approval from the University of Oxford Central University Research Ethics Committee (CUREC) under reference number R66945/RE001.

Procedure

Participants were randomly assigned to one of two experimental conditions (control and haptics) in a between-subjects design. They were given a set of headphones and asked to listen to a song on loop for the duration of the study. Audio levels were set at a volume setting of 52 on the

computer and participants listened to the music on headphones. While they were listening to the music, participants had a haptic wearable device strapped to their wrist on their left hand that was either turned on and vibrated (experimental condition) or was left turned off and did not vibrate (control condition).

The device worn in the study was called The Basslet, a beta prototype wristband acquired from Lofelt Studio, a company that creates tools for developers to integrate haptic capabilities in their apps and games (Lofelt.com). See Figure 2 for an image of The Basslet. The Basslet wristband comes with a “sender” a small device that plugs between headphones and any device with an audio jack socket. The “sender” wirelessly transmits audio information to the Basslet wristband so that it is in sync with the music. Low-frequency, bass sounds in the music are translated by the device’s LoSound engine into high-fidelity frequency vibro-tactile feedback which is felt when the device is strapped to the wrist. In other words, the device vibrates in time with the music but mainly picks up on low-frequency sounds which is why it is so often used for gaming and performance of electronic music e.g., DJ-ing (MusicTech, 2017). The vibration intensity was set to the 4th (medium) intensity setting for all participants in the experimental condition. All participants were told to wear the wristband and follow the instructions as they appeared on the screen. No other information as given to the participants as to the purpose of the wristbands.



Figure 2: The Basslet wristband (Kickstarter, 2017).

The song used was *War of Hearts* by Ruelle and it was taken from a Spotify playlist titled, “Emotional Songs”. This song was listed as “indie” according to Spotify’s metadata, the vocalist was female, and the song was about love – an emotional topic. This song was chosen because it is bass heavy which is necessary for the haptic device to translate into vibrations felt on the skin and the emotional content of the song was likely to generate empathetic responses in listeners.

Participants were asked to listen to the song for 30 seconds and asked to answer some questions about clarity, quality, loudness, quietness, and subjective evaluations of the music. They were also asked a binary choice question about whether they were familiar with the song used in this experiment.

Measures. After 30 seconds, the study began by asking participants a series of questions presented in a randomized order. To assess cognitive empathy towards the artist, participants were asked to

respond to items adapted from the Ad Response Empathy Scale used to assess empathy in response to media (Escalas & Stern, 2003). Participants responded to a set of four statements about *Empathy for Artist* ($\alpha = .95$) on 7-point Likert scales ranging from *strongly disagree* to *strongly agree*: (1) *I understood what the singer was feeling, I understood the singer's point of view*, (2) *While listening to the music, I tried to understand the singer's motivations*, and (3) *I was able to recognise the issues that the singer was singing about*.

To assess the *Parasocial Relationship* ($\alpha = 0.90$) with the artist, participants were asked to respond to eight statements adapted from the Celebrity Parasocial Interaction Scale (Hartmann, 2008; Rubin & Perse, 1987). Participants responded to the following statements on -point Likert scales ranging from *strongly disagree* to *strongly agree*: (1) *When this singer sings about how they are feeling, it helps me understand my own feelings*, (2) *I would feel sorry for this singer if they made a mistake*, (3) *Listening to this singer makes me feel comfortable, as if I am with friends*, (4) *I see this singer as a natural, down-to-earth person*, (5) *I would look forward to hearing news about this singer*, (6) *I find this singer likeable*, (7) *I would like to meet this singer in person*, and (8) *When I listen to this singer, I feel as if I'm a part of their group*.

Artist Loyalty ($\alpha = 0.94$) was measured based on a set of items adapted from a study on loyalty towards musicians (Huang & Phau, 2015). Participants indicated their responses to the following three items on 7-point Likert scales ranging from *strongly disagree* to *strongly agree*: (1) *When I want to listen to music, I would feel safer listening to more music by this singer than trying to listen to a new singer*, (2) *Even though there are many other artists releasing new music, I would feel inclined to listen to music by this singer because I really like them*, and (3) *I plan on listening to new music released by this artist*.

Loneliness ($\alpha = .96$) was also measured because research on immersive technologies suggests that an increased sense of social presence of avatars or figures in virtual environments may also decrease feelings of isolation (Liszio, Emmerich, & Masuch, 2017). Participants responded to the following three items on 7-point Likert scales ranging from strongly disagree to strongly agree: (1) *I feel a bit lonely*, (2) *I feel quite isolated from others*, and (3) *I feel like I lack companionship* (Hadi & Valenzuela, 2014).

Perception of Social Presence ($\alpha = 0.95$) of the artist was measured by a set of items adapted from research on immersive reality (Nowak, 2001; Nowak & Biocca, 2003). Participants indicated their responses to the following five items on 7-point Likert scales ranging from *strongly disagree* to *strongly agree*: (1) *I feel connected to this singer*, (2) *I feel like the singer is here with me*, (3) *I feel like there is a bond between this singer and myself*, (4) *I feel close to this singer*, and (5) *I feel involved with this singer*.

Additional variables were collected for exploratory analyses but, as they were not central to the investigation, they were not included in the main analysis (see Appendix A for list other items included in this study). Two attention checks were embedded in the study and these measures are included in the Appendix A. Finally, participants were asked some demographic questions (age, gender) and a suspicion probe question.

Results

Two participants were excluded for failing the attention checks or failing to answer all of the questions in the survey and one participant was excluded due to their familiarity with the song. The following analyses were conducted on the remaining seventy-seven participants. Analysis of Variance (ANOVA) were conducted on all results to establish main effects, as per journal conventions. All conditions for the ANOVA were met.

Empathy for Artist. An ANOVA determined that there was a significant effect of listening condition such that participants in the haptics condition reported a higher Empathy for Artist Score ($M = 5.58, SE = .22$) than in the control condition ($M = 3.62, SE = .22$); $F(1,75) = 39.53, p < .001, \eta_p^2 = .345$. See Figure 3.1 for mean ratings of Empathy for Artist Score by haptics condition.

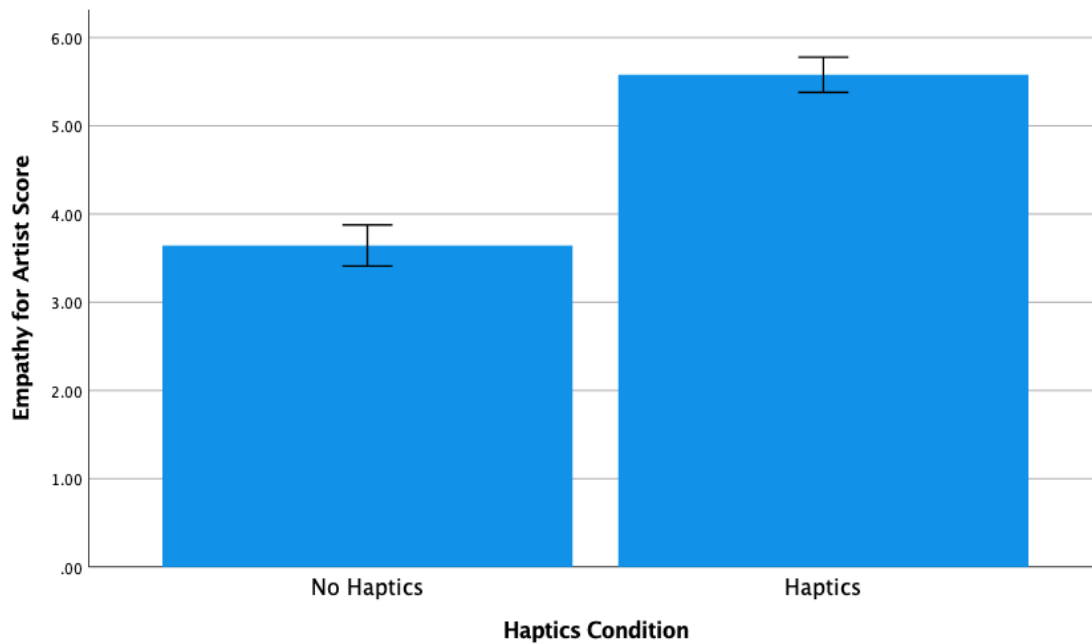


Figure 3.1: Mean ratings of Empathy for Artist Score by haptics condition. Error bars show ± 1 standard error.

Parasocial relationship with artist. An ANOVA with listening condition as the between-subjects factor revealed a significant effect on *Parasocial Relationship* scores. Participants in the haptics condition felt a stronger parasocial relationship with the singer ($M = 4.80$, $SE = .19$) than in the control condition ($M = 3.23$, $SE = .19$); $F(1,75) = 32.88$, $p < .001$, $\eta_p^2 = .311$. See Figure 3.2 for mean ratings of Parasocial Relationship Score by haptics condition.

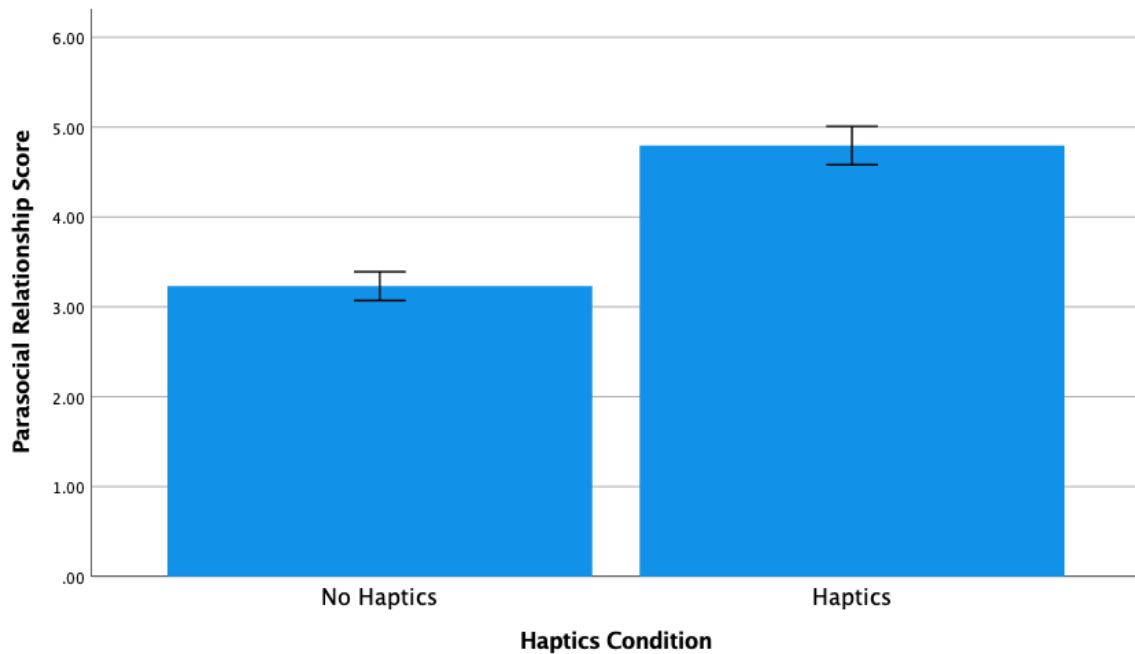


Figure 3.2: Mean ratings of Parasocial Relationship Score by haptics condition. Error bars show ± 1 standard error.

Artist Loyalty. An ANOVA indicated that there was a significant effect of listening condition on Artist Loyalty scores with participants in the haptics condition reporting greater Artist Loyalty scores ($M = 5.42$, $SE = .31$) than participants in the control condition ($M = 3.43$, $SE = .31$); $F(1, 75) = 20.43$, $p < .001$, $\eta_p^2 = .214$. See Figure 3.4 for mean ratings of Artist Loyalty Score by haptics condition.

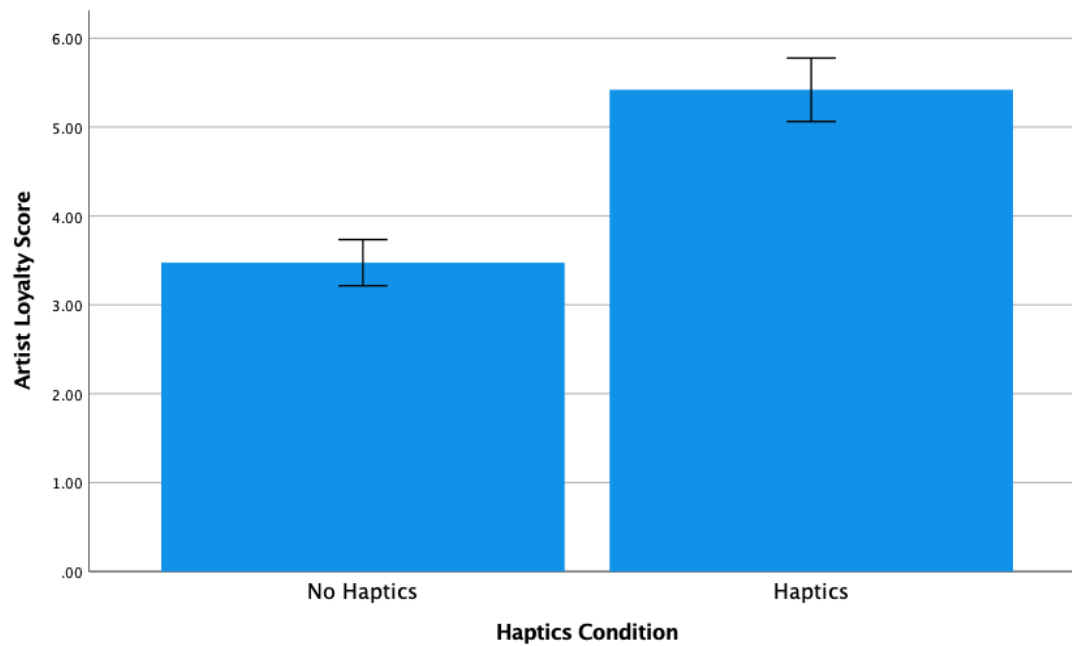


Figure 3.3: Mean ratings of Artist Loyalty Score by haptics condition. Error bars show ± 1 standard error.

Loneliness. An ANOVA with listening condition as the between-subjects factor revealed a significant effect on *Loneliness* scores. Participants in the haptics condition reported lower Loneliness Scores ($M = 2.69$, $SE = .29$) than participants in the control condition ($M = 3.68$, $SE = .29$); $F(1,75) = 5.95$, $p = .017$, $\eta_p^2 = .073$. See Figure X for mean ratings of Empathy for Artist, Parasocial Relationship, Artist Loyalty, Social Presence, and Loneliness Scores by haptics condition. See Figure 3.5 for mean ratings of Loneliness Score by haptics condition.

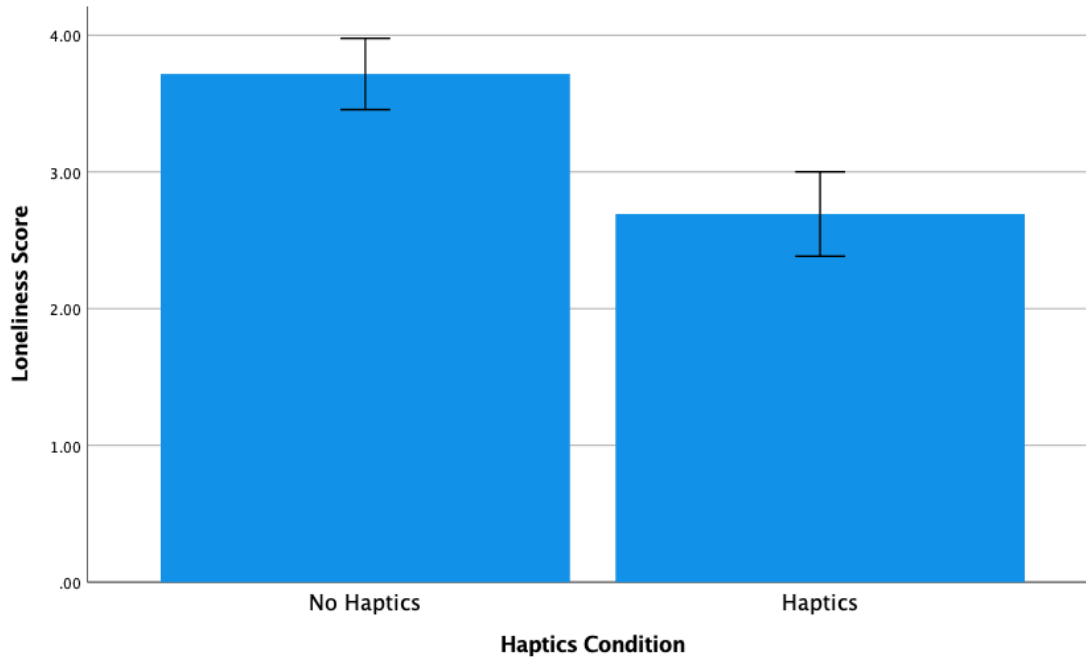


Figure 3.4: Mean ratings of Loneliness Score by haptics condition. Error bars show +/- 1 standard error.

Ancillary measures. Participants did not perceive any significant differences in clarity ($p = .332$), quality ($p = .146$), loudness ($p = .558$), or quietness ($p = .925$) between the haptics and control conditions. Furthermore, the six items measuring music evaluation formed a reliable scale ($\alpha = .85$) and hence they were combined into a single composite measure. An ANOVA determined that there were no significant differences in people's evaluations of the music between the two listening conditions ($p = .300$). None of the participants guessed the purpose of the study in the suspicion probe question.

Based on the immersive technology psychology literature, social presence was identified as a potential mediator of the effect of haptic condition on Empathy for Artist Score, Parasocial

Relationship Score, Artist Loyalty Score, and Loneliness. An ANOVA determined that there was a statistically significant effect of listening condition such that participants in the haptics condition felt a greater sense of Social Presence of the singer ($M = 4.56, SE = .24$) than in the control condition ($M = 2.72, SE = .23$); $F(1, 75) = 30.94, p < .001, \eta_p^2 = .292$. See Figure 3.6 for mean ratings of Loneliness Score by haptics condition.

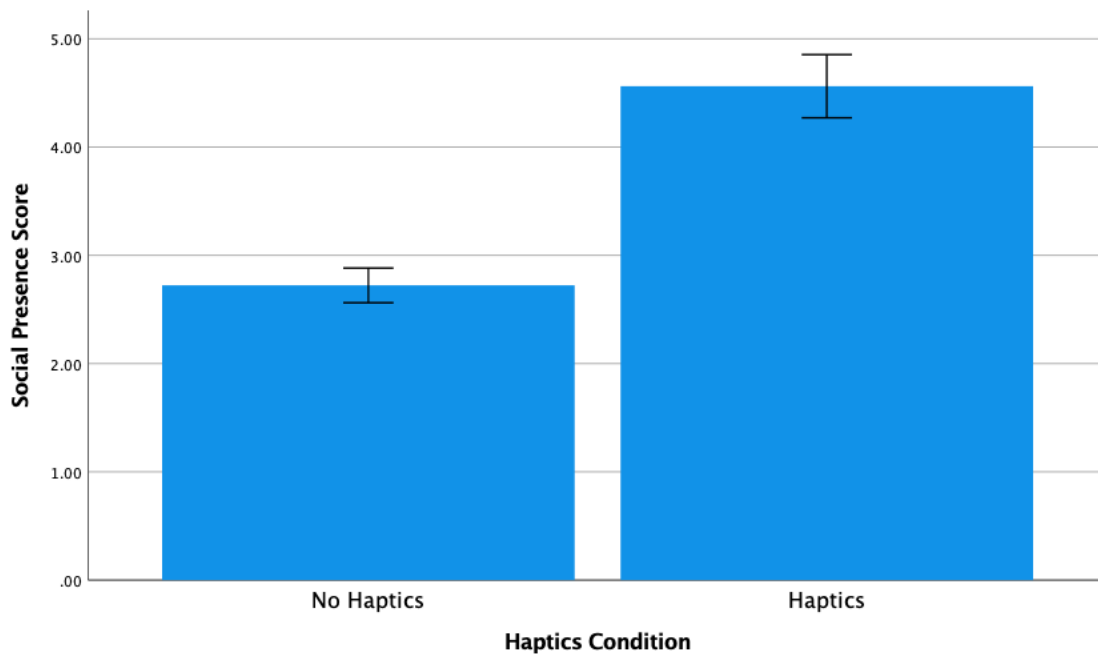


Figure 3.5: Mean ratings of Social Presence Score by haptics condition. Error bars show ± 1 standard error.

To test for social presence as a mediator of the effects of haptic condition on the four dependent variables, mediation analyses were conducted using model 4 in PROCESS SPSS Macro (Hayes, 2017). In this study, the confidence interval was set to 95% and the number of bootstraps was set to 10,000 (Hayes 2017; Preacher & Hayes, 2004). Condition was coded as 1 = haptics, 0 = control.

The bootstrap analysis indicated that social presence was indeed a significant mediator of haptics condition and Empathy for Artist Score, $\beta = 1.00$, $SE = .25$, 95% CI = [.57 – 1.53]. Social presence also mediates the relationship between haptics condition and Parasocial Relationship Score, $\beta = 1.21$, $SE = .26$, 95% CI = [.74 – 1.77]. Social presence also mediates the relationship between haptics condition and Artist Loyalty Score, $\beta = 1.91$, $SE = .44$, 95% CI = [1.11– 2.85]. The relationship between haptics condition and Loneliness Score was also significant, $\beta = -1.25$, $SE = .35$, 95% CI = [-2.03 – -.66]. Table 3 presents the direct effects of the pathway analyses and Table 4 presents the indirect effects of the pathway analysis.

Table 3: Direct effects of mediation analysis of Haptics Condition on Empathy for Artist Score, Parasocial Relationship Score, Artist Loyalty Score, and Loneliness Score, with Social Presence Score as a mediator.

	β	SE	95% CI	p
Empathy for Artist Score	.95	.30	.35 – 1.56	.002
Parasocial Relationship Score	.35	.19	-.02 – .72	.07
Artist Loyalty Score	.09	.32	-.57– .75	.79
Loneliness Score	.26	.41	-.55 – 1.06	.53

Table 4: Indirect effects of mediation analysis of Haptics Condition on Empathy for Artist Score, Parasocial Relationship Score, Artist Loyalty Score, and Loneliness Score, with Social Presence Score as a mediator.

	β	<i>SE</i>	95% CI
Empathy for Artist Score	1.00	.25	.57 – 1.53
Parasocial Relationship Score	1.21	.26	.74 – 1.77
Artist Loyalty Score	1.91	.44	1.11– 2.85
Loneliness Score	-1.25	.35	-2.03 – -.66

Social Presence Score mediates the effect of haptic condition on Empathy for Artist Score, Parasocial Relationship Score, Artist Loyalty Score, and Loneliness Score. There was only one significant direct effect of haptic condition on Empathy for Artist Score when controlling for Social Presence Score (95% CI= .35 – 1.56) which suggests that Social Presence at least partially mediates this relationship. There were no other significant direct effects, suggesting that Social Presence Score fully mediates the relationship of haptic condition on Parasocial Relationship Score (95% CI = -.02 – .72), Artist Loyalty Score (95% CI= -.57– .75), and Loneliness Score (95% CI = -.55 – 1.06).

Discussion

As predicted, the results show that listening to music with haptic feedback increases empathy, loyalty, and parasocial bond with the artist. Results also indicate that listening to music with haptic feedback decreases loneliness. As predicted, the main effect of haptic condition on these variables was mediated by feelings of social presence of the artist. These results indicate that haptic feedback influences the extent that you feel the presence of the artist and that this, in turn, influences how connected you feel to the artist. Social presence of the artist fully mediates the relationship between haptics condition and artist loyalty, parasocial bond, and loneliness which suggests that it completely explains the effect. Social presence only partially mediates the relationship between haptics condition and empathy for the artist, suggesting that there might be an additional mechanism by which haptic feedback increases feelings of empathy towards the artist.

As this was an exploratory study, there are several limitations that need to be addressed. An additional follow up study was planned and I was hoping to make modifications based on some of these limitations for the follow-up studies. Due to the COVID-19 pandemic, however, I was unable to conduct the additional study. I will address the changes I had planned on making for the subsequent study in the limitations listed below.

Music Stimulus

In the current study, participants all heard the same song about sadness with female vocals. This is potentially problematic because it is unclear just how generalizable these findings are. In the planned follow-up study, I would have selected 5 songs of a variety of different genres with a mix of male and female vocalists. The songs would have been pre-tested to ensure that the songs were not extremely emotional/unemotional to ensure that there are no ceiling or floor effects due to

stimuli choice. The songs would then be treated as a random factor and the headphones condition would have been treated as the fixed factor in a linear mixed effects model regression analysis.

Potential confound - Lower level explanations

This study did not eliminate all possible confounds so it is not entirely clear that the synchrony between the haptic feedback and the music is what underlies the relationship between haptics condition and the main effects. An alternative, lower level explanation is that stimulus intensity might explain the main effects of haptic condition on empathy, parasocial bonds, and artist loyalty. The mere presence of haptic pressure of any kind might increase positive feelings towards the artist as research shows that the presence of haptic stimulation influences expectations and enjoyment of technology-mediated experiences (Maggioni, Agostinelli, & Obrist, 2017). If the mere presence of haptics explains feelings of social presence, the fact that the haptic feedback is synchronous with the music may not explain the results. This more parsimonious explanation, however, is unlikely to explain the effect as there is significant research suggesting synchrony in music and dance increases positive affect, generates feelings of social closeness, and facilitates social bonding (Knight, Spiro, & Cross, 2017; Rabinowitch & Cross, 2019; Tarr, Launay, & Dunbar, 2016; Tarr et al., 2015; Tarr, Launay, & Dunbar, 2014). While this research largely deals with interpersonal synchrony in collective movement or music-making exercises, studies on haptic technologies also show that people are sensitive to auditory-haptic time delays and prefer shorter gaps between auditory and haptic feedback (Montag et al. 2011; Stupacher, Wood, & Witte, 2017). It is possible that this preference for haptic-auditory feedback synchrony is due to increased processing fluency (Stanton & Spence, 2020).

To test these competing hypotheses, my second experiment with haptic wearable devices was supposed to have three conditions- a synchronous, asynchronous condition, and no-haptics

condition. In the synchronous condition, the haptic feedback would be in time with the music. In the asynchronous condition, the haptic feedback would be delayed by 75 ms (Navarra, Soto-Faraco, & Spence, 2007; Vogels, 2004). The no-haptics condition would remain the same - participants would be given a wristband with the haptic feedback function disabled. If synchrony matters, there should be a significant difference in empathy, parasocial bond, and artist loyalty scores between the synchronous and asynchronous haptic conditions. If the explanation for the effect is mere stimulus intensity, there should be no difference between the asynchronous and synchronous conditions. My prediction is that synchrony does matter and that mean empathy, parasocial bond, and artist loyalty scores would be higher for the synchronous condition in comparison with the asynchronous condition. I further anticipate that the mean empathy, parasocial bond, and artist loyalty scores would be lower for the asynchronous condition versus the no-haptics (control) condition.

Response Bias

Second, there might have been a problem of response bias as participants in the haptics condition would have felt the device vibrate and, therefore, might have felt more inclined to rate on the extremes of the scales given. The planned follow-up study with the three haptics conditions (synchronous haptics, asynchronous haptics, and no haptics) would have controlled for potential demand effects as there would have been two conditions in which participants would have received haptic feedback. If I had found significant differences between the responses in the synchronous haptics and asynchronous haptics conditions, it would have ruled out response bias as a potential confound.

Furthermore, several participants in the control condition voiced confusion as to the purpose of the wristband as they were not given any information before or after the study. In the second iteration of this study, I had planned on getting ethical approval for a deception protocol. Participants would have been given the same, false explanation as to the purpose of the wristband in both conditions. They would have been told that the devices measured physiological data, such as heart rate and electrodermal response. That said, the present study contained a suspicion probe and none of the participants correctly guessed the purpose of the study in either the haptics or the control condition so, while there might be a problem of response bias, it is not clear that participants would have anticipated the direction of the effect hypothesized.

Haptics and vocals

While I found that the haptic feedback increased sense of psychological connection to the singer, it should be noted that the haptic device was not actually translating the frequencies sung by the singer into tactile feedback. This is because the haptic device works by translating the low frequency elements in the auditory scene into vibrotactile feedback and the low frequency sounds in the music were actually generated by the instrumentalists accompanying the singer e.g., the drums and low frequency piano accompaniment (Turchet, West, & Wanderly, 2020). Thus, while it appears that people associated the haptic feedback with the vocals, the device itself was not picking up on the frequencies of the singer. It is possible that participants really only associated the haptic feedback and sense of connection to the singer because the questions in the study specifically asked about the singer, another example of a possible demand effect. Future research may wish to control for this potential confound by using music excerpts with a single instrument that produces low frequency noises, like a drum solo, and then ask questions about sense of connection to the artist.

Self-reported data

Like with the headphones study, all of the current measures are self-reported and it would be useful to collect physiological data to corroborate the self-reported data. Studies on music show that self-reported and physiological data can sometimes diverge and that self-reported answers may not always reflect the full, nuanced processes that underlie how people respond to music (Ellis & Simons, 2005; Richardson et al., 2020). While I did not make specific predictions, I intended to collect exploratory physiological data to analyse in conjunction with the self-reported measures. I had planned on collecting all of this physiological data with the same device - the E4 wristband by Empatica, a non-invasive, unobtrusive tool used for collection of multiple physiological measures in real-time (see Milstein & Gordon, 2020). This data would have then been compared with the self-reported measures to check for consistency. Once again, however, the primary objective of these studies was to assess emotional connection to the artist and physiological data does not entirely captures this information.

Haptic placement

The present study required participants to wear a wristband that delivered haptic feedback and it is quite possible that this was not the most natural experience as people most frequently feel haptic feedback in their chest/torso area when listening to music live at a concert (Hove, Martinez, & Stupacher, 2020). It might be better to use devices that mimic the haptic feedback that one might normally receive in a live event. The Tactstuit X40 (Knoxlab), for example, is a vest that is strapped to the torso and delivers haptic feedback. It is often used in gaming and may provide more natural-feeling haptic feedback when users are listening to music. I did not, however, plan on using haptic vests for the follow-up experiment due to cost constraints. One benefit of using haptic wristbands

instead of more cumbersome haptic vests, however, is that they are extremely light and cost effective. This research may, hopefully, encourage people to use these devices as a simple and inexpensive way of augmenting the at-home music listening experience.

This study presents some of the first experimental data on the psychological impact of listening to music while wearing haptic wearable devices. This research builds on previous work suggesting that haptics can increase the salience and augment the emotional experience of audio-visual media (Lemmens et al., 2009; Mazzoni & Bryan-Kinns, 2015). My research suggests that the immersive nature of haptics allows for the communication of emotions and, thus, generates a sense of social presence. Thus, the listener feels like the artist is somehow “there” in the same space as them. These findings suggest that social presence mediates the effect of haptics on a number of measures of psychological connection to the artist. Additionally, because haptic feedback increased a sense of social presence, it also decreased feelings of loneliness in the listener. The results of this experiment present evidence of how haptic wearables can be used to augment the music listening experience by enhancing the listener’s sense of connection to the artist and also provide promising, preliminary evidence that these devices can also lead to decreased feelings of loneliness when used to engage with recorded music.

Conclusions of Chapters 2 & 3

The present studies investigated whether listening to music while wearing immersive technologies influenced feelings of empathy, parasocial bond, and loyalty towards the artist. Two immersive technologies were tested which influenced two different sensory modalities. The results confirmed the hypothesis that both haptics and headphones increase the listener’s sense of psychological

connection to the artist. Specifically, results showed increased feelings of empathy, parasocial bond, and loyalty to the artist when listening to music with haptic feedback and while wearing headphones. While no specific predictions were made about loneliness, results indicated that listening to music with headphones and haptic feedback decreased feelings of loneliness. As hypothesized, the studies also showed that both of these technologies had similar process explanations. Both headphones and haptics generated feelings of social presence which mediated the effect of experimental condition on the dependent variables.

These findings contribute to the literature on the intersection of immersive technology and human psychology. While much of the literature thus far has focused on other forms of entertainment such as video games and film, this is some of the first research to explore how immersive technologies augment the music listening experience and specifically explore how these technologies influence listener attitudes towards the artist. While much of the immersive technology literature relates to virtual reality, this research contributes to research on two technologies that are less frequently studied - headphones and haptic devices.

These studies also add to the literature exploring the psychological mechanisms that underlie how these immersive technologies influence user attitudes towards individuals in the technology-mediated environment (e.g., virtual personalities, avatars, etc). These results are in line with previous work suggesting that immersive technologies increase empathy towards others because they generate feelings of social presence (Bouchard et al., 2013). This research presents the first evidence that immersive technologies can generate a sense of social presence when used to engage with an artistic stimulus like music.

The results were also in accordance with previous research suggesting that immersive technologies can reduce feelings of loneliness because they increase sense of social presence (Baecker et al., 2014; Crane, 2005). Listening to music with headphones and haptic feedback increased perception of the presence of the artist and, therefore, decreased loneliness. This may provide an interesting avenue for those interested in the uses of immersive technology in combating the rising loneliness epidemic (Chopik, 2016; Shah et al., 2019; & Shah et al., 2020). Although these results are preliminary, the findings may be of great interest to those wishing to augment the music listening experience as well as artists who are interested in boosting fan engagement.

Scope for Further Exploration

This preliminary work presents interesting avenues for new research. For one, both studies only had two conditions each - an immersive condition and a non-immersive condition. To test if the degree of immersion is what truly underlies the relationship between the experimental conditions and measures of connection, future studies may wish to add additional independent variable conditions that vary in immersiveness. For example, a study on headphones may wish to vary immersion by using speakers (least immersive), regular headphones (more immersive), and noise cancelling headphones (most immersive). A study on haptics may wish to vary haptic pressures by varying either haptic intensity on the same device or the amount of surface area of skin receiving haptic feedback. The haptic intensity of the Basslet device can be set in advance at varying levels of intensity from least to most intense. Alternatively, degree of immersion can be manipulated by how much skin surface area is covered by the haptic device. For example, the Basslet device covers less surface area than haptic vests like the Tactstuit X40 (Knoxlab). Future studies may also wish to ask participants to rate perception of immersion as a manipulation check.

Second, future research may also wish to understand the boundary conditions for the effects observed by using different musical stimuli. For example, it is possible that psychological connection to the artist can only be enhanced if the listener already feels a sense of baseline connectedness to the artist due to the emotional content of the music. In this study, I used highly emotional music about themes like love and sadness which may have allowed participants to feel a sense of connection to the artist which was then enhanced by the immersive technologies. It may not, however, be possible to enhance psychological connection to the artist if the music is about less relatable themes or is deemed unemotional by the listener.

Furthermore, the present studies investigated music as a purely auditory stimulus even though musical experiences can often be audio-visual e.g., music videos, recordings of performances, etc. It would be interesting to explore whether haptic wearable devices and headphones can augment sense of connection to artists when engaging in audio-visual experiences of music. Further explorations could also explore immersive technologies beyond haptic devices and headphones, like virtual reality. While watching videos of live performances on YouTube on a two-dimensional screen may lack presence and authenticity, recent developments in technologies, such as virtual reality, have created highly immersive experiences that generate feelings of being “transported” elsewhere (Charron, 2017). Research suggests that virtual reality can increase sense of connection to individuals in the virtual environment in non-musical contexts so it stands to reason that virtual reality may also generate feelings of psychological connection to the artist (Laws, 2012). Because virtual reality videos often film performances with live audiences, it might also be interesting to study whether these immersive environments generate feelings of connection to other fans.

Finally, artist loyalty was the only downstream measure collected in both of these studies. Future research may wish to collect data on other consumer behaviour variables such as intent to buy concert tickets by the singer or willingness to purchase the artist's merchandise

Conclusion

The current studies demonstrated that listening to music with immersive technologies can augment the sense of psychological connectedness to the artist. While previous research in the field of haptics has largely focused on the multisensory role of haptics in sound perception and/or the role of haptics in generating a sense of social presence, this study combines these research areas by examining the role of haptics in enhancing sense of social connection when engaging in an art experience. The direct value of this research is that I have identified a low-cost way for listeners to enhance their experience of recorded music from the comfort of their home. Additionally, this research may be of interest to musicians intending to build relationships with their audience and music industry professionals seeking to find novel ways of increasing fan engagement.

This project has become timely as there has been an increase in demand for recorded entertainment that can be accessed from the home due to the COVID-19 pandemic (Oxford Business Group, 2020). These results suggest that music may be consumed via immersive technologies to boost engagement with artists and this especially relevant research in the absence of live events. These preliminary findings also provide an exciting opportunity to further investigate the role of immersive technologies in enhancing our sense of connection to artists when engaging with art more generally, for example virtual reality mediated experiences of visual art and haptic wearable devices used while watching films, plays, or concerts.

Transition from Part I to Part II

Part I (Chapters 2 and 3) investigated one implication of art as a means of communication between artist and audience. Specifically, I researched how audience connection to artists can be enhanced via the use of immersive technologies. These findings indicated that the connection between audience and artist can be augmented through the use of immersive technologies such as headphones and haptic wearable devices. These technologies can increase empathy, parasocial bond, and loyalty towards artists and also decrease feelings of loneliness in listeners. This is because both of these technologies generate a sense of social presence in the listener.

While the studies on headphones and haptics were mainly concerned the sense of connection between audience and artist, people often connect with art by another process called “appropriation”. To appropriate an emotion, in any context, is to experience the emotion as if it is your own. When appropriating emotion in art, you experience the art as giving voice to your own emotions. That is, you experience the emotions in art as though they are your own emotions instead of the emotions of the artist. In this next section, I propose that the psychological process of appropriating is something that we tend to do in art contexts more than in not-art/everyday contexts. I also propose that appropriation explains why we enjoy the expression of negative emotion in art but not in everyday life. A series of five experiments tested the hypothesis that merely framing a text that expresses sadness as art allows people to enjoy it.

CHAPTER 4: PART II- WHY DO WE LIKE SAD ART?

Introduction

The bar has grown quieter, night has fallen, and a stranger sitting next to you, who has remained quiet throughout the evening, turns to you with a grimace and begins to pour out her feelings. Her life is miserable, she says. She is lonely, angry, and deeply, deeply sad. Her words keep coming at you for what seems like an eternity, her sadness seemingly inexhaustible. After a while, you begin to feel overwhelmed by her wretched monologue and increasingly sad yourself. You simply want the whole thing to end.

Now imagine your reaction if this wretched monologue was part of a poetry recitation. Imagine that her speech, word for word the same, was recited at the bar's weekly poetry reading night. Even if you knew the poem expressed what she really feels, you might now find the recitation absolutely riveting and perhaps even enjoyable.

This difference—the contrast between our experience of negative emotion in art and in everyday life—gives rise to what has been called the paradox of tragedy or, more recently, the paradox of negative emotion in art. The paradox is that we seem to enjoy in art the very same emotions that we abhor in life (Aristotle, trans. 1997; Augustine trans. 1960; Hume 1758/1987; for contemporary discussion, see, e.g., Carroll 1990; Feagin 1983; Morreal 1985; Levinson, 1982; Walton 2000; for reviews, see Smuts 2009; Strohl 2019).

Research in philosophy has led to the development of a concept that might be helpful in addressing this problem: the concept of *appropriation* (Levinson, 1982; Ribeiro, 2014; Walton,

1988). Consider the case in which a person performs a monologue about her misery. Even if you know that she is actually feeling miserable, to the extent that she presents her monologue as a work of art, you might not think of it primarily as an expression of her emotions. Instead, you might “appropriate” the monologue. That is, you might experience it as an expression of *your own* emotions.

In short, the concept of appropriation makes it possible to formulate a new hypothesis about why people show greater liking for the expression of negative emotions when this expression is presented as art. The hypothesis is that seeing something as a work of art leads to increased appropriation, and increased appropriation leads to increased liking.

Previous research on the paradox of negative emotion in art

Existing research has revealed two different respects in which people show greater liking for expressions of negative emotion in art versus not-art. Firstly, there is the obvious fact that expressions of negative emotion within art involve various formal features that make them more beautiful (e.g., Bantinaki, 2012; Galgut, 2001; Hume 1758/1987; Robinson, 2004). Secondly, there seems to be a further process at work. Even when the actual features of the work itself are held precisely constant (e.g., when participants in both conditions receive exactly the same text, or exactly the same photograph), participants seem to show greater liking for an object when they have been encouraged to regard it as a work of art (Greger, Leder, & Kremer, 2014; Van Dongen et al., 2016; Wagner et al., 2014).

Beginning with the first phenomenon, people have argued that one potential reason why people like sad art is that art contains formal elements which make it beautiful. Philosopher Jenefer

Robinson suggests that the formal features in art allow the audience to distract themselves from the painful or distressing aspects of sad art (Robinson, 2004). She proposes that the formal features allow us to lose ourselves in the aesthetically pleasing aspects of a work and/or intellectualize the work instead of focusing on the negative emotion that it may invoke in us. Numerous studies find evidence for this suggestion as people show greater liking for expressions of emotion when those expressions include the sort of formal features associated with art. Empirical research has confirmed that our enjoyment of art is driven to a significant extent by features such as symmetry, consonance, and parallelism (Alter & Oppenheimer, 2008; Oppenheimer, 2008; Reber, Schwartz, & Winkielman, 2004). For example, increasing the presence of alliteration, metre, and rhyme in a poem increased liking of the work (Menninghaus et al., 2017). Higher clarity and contrast increases liking, ratings of prettiness, and decreased ratings of ugliness in visual art displays (Reber, Schwartz, & Winkielman, 1998). Similarly, more harmonic sequence repetition in music increases liking while rearranging the structure of pop and rock songs decreases liking of the music (Agres et al., 2017; Rolison & Edworthy, 2012). In light of this evidence, we can see why people would generally enjoy sadness when expressed in art. The idea, in short, is that art makes sadness enjoyable by expressing it in beautiful and interesting ways. We relish not the melancholy of Hamlet, but rather how this rich and complex emotion finds expression in the words of Shakespeare (cf. Ribeiro, 2014; Robinson, 2004; Schier, 1983).

While it may seem obvious that there is something very important about the formal properties being integral to liking of sad art, the second view on enjoyment of sad art suggests that there is something special about merely conceptualising something as art. In other words, there is something over and above the formal features of art that might explain liking of sad art. This view suggests that conceptualising something as art changes how we experience the negative emotions

the object might express. There is considerable empirical evidence supporting this intuition. Studies have shown that simply framing a photograph or text as art can change the way we respond to it. For example, framing an excerpt of text as a newspaper article versus a work of literature impacted how long it took people to read the text and how much they remembered it afterwards (Zwaan, 1991). Participants spent more time attending to the meaning of the text when they thought they were reading a work of literature. Another study found that framing an image as an artwork rather than as an image from everyday life influenced patterns of brain activation, suggesting that framing effects influenced cognitive processing (Cupchick et al., 2009). This study in particular found increased activation of the bilateral insula and of the left lateral prefrontal cortex in the art condition, suggesting that people have a stronger emotional reaction and pay greater attention to the details of the work when it is presented as a work of art.

Studies have explicitly investigated the issue of whether conceptualising something as art leads to greater enjoyment of negative emotion. For example, a study that presented photographs of disgusting images told participants that they were either viewing pictures from a recent exhibition at a famous art museum or that they were viewing pictures for a website on hygiene instruction (Wagner et al., 2014). Participants in this study reported feeling higher levels of positive affect in the art framing condition compared to the not-art condition. While this study did not find any differences in liking between photographs in the art and not-art conditions, other studies have found that merely categorising something as art actually influences enjoyment of the work. One study presented photographs as either a work of art or a press photograph (Greger, Leder, & Kremer, 2014). When the content of the photograph was negative, people rated the photograph more positively in the art context than in the not-art context. Another study found that presenting affective images as either art (e.g., stills from a movie) or not-art (e.g., scenes from a documentary)

influenced people's appreciation of them (Van Dongen et al., 2016). People liked the images more in the art conditions compared to the not-art conditions.

This body of evidence suggests that simply conceptualising something as art changes the way we think about the object. In particular, conceptualising objects expressing negative emotions appears to increase our enjoyment of those objects. Now we arrive at a further question. Why exactly does conceptualising an object as art lead to increased liking?

One explanatory hypothesis: Fictionality

One potential explanation for this is that when people conceptualise something as art, they tend to think of it as *fictional*. For example, outside the domain of art, if people read a passage about some horrible event taking place, they might assume that the horrible event actually did take place, and that assumption would lead to decreased liking. By contrast, if people are told that the passage was written as part of a work of art, they may assume that it is purely fictional and that the horrible event did not actually take place. This belief may then lead to increased liking.

In support of this hypothesis, existing studies suggest that people do indeed show increased liking for depictions of sad events when they are told that the descriptions are purely fictional. One study found that participants reported lower anxiety levels when a sad movie clip was framed as fictional as opposed to nonfictional (Goldstein, 2009). Research also suggests that people like negative events or images more when they are presented as fictional. Framing photographs of mutilated bodies as images from a fictional movie decreased cardiac activity and stress compared to when the same photographs were framed as stills from a documentary (Mocaiber et al., 2011). Furthermore, another study showed that people self-report greater positive affect in response to

a film when it is presented as fictional rather than real (Pouliot & Cowen, 2007). Thus, if conceptualising an object as a work of art generally leads people to be more inclined to regard it as fictional, one should expect greater liking for depictions of sad events when these sad depictions are seen as works of art.

A question now arises as to whether the difference in liking for negative emotions in art versus not-art is really due to a difference in perceived fictionality. One way to explore this question is to examine what happens in cases of art that is clearly not based on fiction. Sylvia Plath's poetry is often autobiographical in nature, Eric Clapton's song *Tears in Heaven* is about the death of his son, and Larry Clark's photography series, *Tulsa*, documents sex, drug use, and violence as they happened in his life. These works are intended to be works of art, but at the same time, they are not intended to be fictional. Thus, if the impact of seeing something as a work of art was entirely due to fictionality, people would have less of an affinity for such works.

Alternatively, however, it might be that seeing something as a work of art can lead to increased liking even in cases where it is not regarded as fictional. The hypothesis I will be developing in this chapter makes precisely this prediction.

An alternative hypothesis: Appropriation

At the core of my hypothesis is the concept of *appropriation* (Elliott, 1966; Levinson, 1982; Ribeiro, 2014; Walton, 1988). This concept was first introduced within the philosophical literature (Elliott, 1966; Levinson 1982; Riberio, 2014; Walton, 1988). However, I will use this literature to address empirical questions about liking of sad art. I posit that people like the expression of negative emotions insofar as they can appropriate them. Then my claim will be that people are more

inclined to appropriate negative emotion to the extent that they see the expression of that emotion as a work of art. Putting these points together, I arrive at an explanation for the effect whereby people show greater liking for expressions of negative emotion when they see those expressions as works of art.

To begin, I will define the term “appropriation”. Consider a line in a poem that expresses sadness. A question arises: whose sadness is being expressed? Different readers might give different answers. Some readers might experience the sadness as that of the author of the poem, others might experience the sadness as the expression of a narrator or implied author (Booth, 1961). Finally, readers may experience the sadness as an expression of *their own* feelings. This last way of experiencing the poem is what I will refer to as “appropriation.” In contrast to the first two cases, where the negative emotion is experienced as coming “from without” (either from the actual person who wrote the line or from some fictional person contained in the work), to appropriate is to experience the sadness as coming “from within” (Elliot, 1966: 112).

Appropriation is a distinctive way of responding to an expression of emotion. Suppose that you are reading a poem that describes certain emotions from the first-person perspective using the word “I” (e.g., “I feel so alone”). If you appropriate the poem, then despite the fact that the poem uses the word “I,” you will tend to understand it not only as expressing the author’s emotions but also as expressing your own emotions. As the philosopher Arthur Danto writes, when a work is meant to be appropriated in this way, “it is about each individual that reads the text at the moment that individual reads it, and it contains an implied indexical: each work is about the ‘I’ that reads the text...” (Danto, 1984: 16).

To make this definition of appropriation even more clear, consider the difference between (a) the experience of listening to someone else expressing their emotions and (b) the experience of expressing your own emotions. When expressing your own emotions, you begin by evaluating intrinsic and extrinsic emotional cues, experience the emotion, and then generate an appropriate emotional response (Gross, 1998; Gross, John, & Richards, 2000). These psychological processes involved in expressing your own emotions are not the same psychological processes that are involved when hearing someone else express their emotions. The claim is that experiencing art through appropriation is closer to process (b) than to process (a). When reading a lyric poem, for example, you might respond with (b), the sorts of psychological processes that are distinctive to expressions of your own emotions.

Philosophers have suggested that appropriating a work of sad art might increase liking of the work for several reasons (Ribeiro, 2014; Levinson, 1982). Firstly, appropriating sad art is said to give voice to feelings and thoughts which may be hard for the reader themselves to express. The “richness and spontaneity” of expression in sad art allows you to convey what you may not be able to communicate ourselves and makes you feel like you are getting something “off your chest”, leading to a sense of relief (Ribeiro, 2014: 198). This sense of relief, also known as catharsis, enables the audience to purge themselves of negative emotions which they might otherwise have been suppressing (Aristotle, trans. 1997; Strohl, 2019). It has been said that this process of purging gives rise to positive emotion (Strohl, 2019). Secondly, it gives us a sense of mastery or control over our own emotions, allowing us to explore our feelings in a safe environment (Levinson, 1982). In a sense, appropriation allows us to experience a “dry-run” of negative emotional states and thoughts and explore the range of our emotional experience within a controlled context (Levinson, 1982: 340). Third, it allows us to “relish” extreme emotions that we value without having to experience

the negative real-world consequences associated with feeling those emotions in everyday life (Levinson, 1982: 338). For example, we might value emotions like intense grief and may wish to experience it without actually losing a loved one (Strohl, 2019). Appropriating Mozart's *Requiem*, for instance, may allow us to explore feelings of grief without actually experiencing death and loss in real life. Philosophers have proposed other reasons as to why appropriation allows us to enjoy the experience of negative emotions, but the consensus is that appropriation increases liking of sad art (Levinson, 1982).

I now introduce the hypothesis that seeing something as a work of art doesn't just increase the degree to which people perceive it as fictional, it also increases the degree to which people appropriate it. In other words, simply conceptualising something (a text, a photograph, a picture) as art might allow you to experience the work through process (b) instead of process (a). That is, when you appropriate a work of art, you can experience the work as an expression of your own emotions rather than someone else's emotions. Note that this hypothesis does not in any way depend on perceiving the content of a work as fictional. As such, it implies that we could enjoy sad art even when we know that the sadness it expresses is very much real. This could, potentially, explain why we might enjoy works such as Plath's poetry and Clarke's *Tulsa*.

To illustrate this, imagine that you are having a conversation with someone and they say, "I feel so alone". When this person expresses their loneliness, you would presumably understand that this person is trying to communicate something about her own emotions and coordinate appropriate behavioural responses, such as expressing concern for her well-being. You might even feel distressed in response to her. Now imagine that she says the exact same words but as part of a poem at a poetry recital. You might understand her expression of loneliness to be genuine and

not fictional and yet, there is something different about this scenario. In this case, you might assume that you are not supposed to see it as her attempt to communicate her emotions to you and you are clearly not supposed to be worried about her well-being. Instead, according to my hypothesis, you are invited to appropriate her words and experience it as an expression of your own loneliness because they have been presented as part of a work of art. When you appropriate her words, you are allowed to enjoy the expression of her loneliness.

If this hypothesis is correct, it gives us a new explanation for the effect of art versus not-art on liking. The explanation is that this effect is mediated by appropriation. Seeing something as art leads to increased appropriation, and increased appropriation leads to increased liking.

The present studies

Five experiments tested the hypothesis that appropriation explains the difference in liking between sad art versus sad not-art. Study 1 investigated whether merely framing some sentences as either song lyrics (art) or Tweets (not-art) influenced liking for sentences that varied in affect (sad, neutral, and happy). Study 2 tested the generalizability of the findings by examining whether merely framing a text that expresses sadness as art allows people to enjoy it, over and above the formal properties that normally distinguish art from not-art, for a variety of different art/not-art forms. Study 3 investigated whether perceived fictionality of the text could account for the difference in liking. Study 4 explored whether people appropriate the emotions in the art conditions more than in the not-art conditions. Study 5 eliminated a potential confound in the stimulus design to ensure that the effects found were not due to inferred differences in quality between the art/not-art conditions.

Study 1

In this first study, I investigated whether people show greater liking for a text that is framed as art versus not-art but only when the content of the text is sad. To test this, participants read a set of sentences (modified from real tweets on Twitter and real song lyrics) that were either positive, negative, or neutral in affect. I then told participants that they were either reading song lyrics or tweets from Twitter. No changes were made to the sentences between the art and not-art conditions so participants read the exact sentences across the art and not-art conditions. The hypothesis was that there would be a significant interaction effect between art/not-art condition and affect condition on liking such that there would only be a difference in liking between art/not-art in the sad affect condition. Specifically, I predicted that participants report greater liking for sad art than sad not-art.

Methods

Participants. Six hundred participants (69.2% Female, $M_{\text{age}} = 36.7$ years, $SD_{\text{age}} = 12.0$ years) were recruited via Prolific Academic. They were paid \$.70 in exchange for taking part in this three-minute study. All methods and data analyses were pre-registered on As Predicted (<https://aspredicted.org/blind.php?x=2um2qr>). Ethical approval for all studies included in this chapter was obtained from the Yale Institutional Review Board and the University of Oxford Central University Research Ethics Committee (CUREC) under reference number R69522/RE001.

Stimuli. Participants were randomly assigned to one of six conditions in a 2 (lyrics versus not lyrics) x 3 (affect: happy vs. neutral vs. sad) between-participants experimental design. Participants were told the following in the song lyrics conditions:

"You are about to read a selection of original song lyrics that were shared on social media. After reading each song lyric, you may choose to either "like" it (by clicking the "like" button below the post) or not like it (in which case you may simply click the "next" button). "

Participants in the not-lyrics conditions were told the following:

"You are about to read a selection of posts that were shared on social media. After reading each tweet, you may choose to either "like" the post (by clicking the "like" button below the post) or not like it (in which case you may simply click the "next" button)."

All of the participants within each affect condition saw multiple excerpts of texts which were based on a mix of real tweets or song lyrics. All song lyric excerpts were under 280 characters to match the maximum length of a Tweet.

The texts were presented in a randomised order. In the happy conditions, participants read the following texts:

"Here's to the greatest day of my life surrounded by my favorites. I feel so lucky to be surrounded by my amazing friends and family. Life doesn't get better than this!"

"You know that warm, fuzzy feeling you get when you know someone genuinely loves you and you love them too? It's like the feeling of eating chocolate, but better!"

"I'm happy that you're happy. Because when you smile, I smile. And your smile lights up the whole world and reminds me that everything is going to be okay."

"I've got sunshine in my pocket and feel the good vibes creepin' up. I just feel like dancing"

"Just one touch and I believe. My heart stops when you look at me. What we have is real so take a chance and don't ever look back"

"Never thought I'd be so happy standing in the rain at 3am watching these cute boys pass by. I can't stop giggling"

In the neutral conditions, participants read the following texts:

"I better stop playing and get my taxes done. I keep forgetting to get them done..."

"Didn't have a translator so used my broken Japanese. Let's just say sometimes meaning can get lost in translation."

"The path is twisted and winding. It's a heck of a trek that goes uphill and then downhill and then uphill again. Just trying to make it to the end of this trail."

"I'm not dying or crying, I'm just sweating like crazy cause it's so hot out. This summer is really intense. Let's just hope it rains soon."

"Don't rush anything. Slow progress is still progress."

"Just some late night musings. Nights are nights and days are also nights falling down. And within the event horizon, the bounds of space and time disappear."

In the sad conditions, participants read the following texts:

"I just want to be okay today. I just wanna feel like me again. Open me up and you will see that I'm a gallery of broken hearts. I'm beyond repair so just let me be."

“The worst pain is getting hurt by the person you explained your pain to. I saw fire in your eyes and found death in your smile. Maybe I just have to accept that I really am alone in this world”

“I try and try but these wounds won’t seem to heal. This pain is just too real. There’s just too much that time cannot erase.”

“Sometimes I wonder if I should stop the pain by refusing to dream anymore. My dreams are dead and I’m just so tired of trying. I could just be gone and not exist.”

“Can someone just make me forget? I pretend everything is fine. I’m faking another smile, painting it on my face like drunken graffiti. But sometimes this world is just too much.”

“You can’t expect me to be fine, I don’t expect you to care. I’ve wasted my nights, you turned out the lights, and now I’m paralyzed.”

Participants were then asked to answer three questions presented in a randomised order: *“How much did you enjoy reading these posts?”*, *“How much did you like reading these posts?”*, and *“To what extent did you find reading these posts pleasurable?”* Responses were recorded on 7-point Likert scales ranging from 1 = not at all to 7 = very much so.

Results

No participants were excluded so the following analyses were conducted with all participants. First, a reliability analysis was conducted and the three measures were combined into one reliable scale ($\alpha = .97$). Results were analysed using a 2 (post type) x 3 (affect) Analysis of Variance (ANOVA). The mean responses in each condition are displayed in Figure 1. There was a significant main effect of affect, $F(1, 595) = 81.2, p < .001, \eta_p^2 = .215$, and a significant main effect

of lyrics/not-lyrics, $F(1, 595) = 22.6, p < .001, \eta_p^2 = .037$. Importantly, there was also a significant interaction effect between affect and lyrics/not-lyrics, $F(1, 595) = 4.4, p = .012, \eta_p^2 = .015$. See Figure 4.1 for mean ratings of liking for the three affect conditions and lyrics/not lyrics.

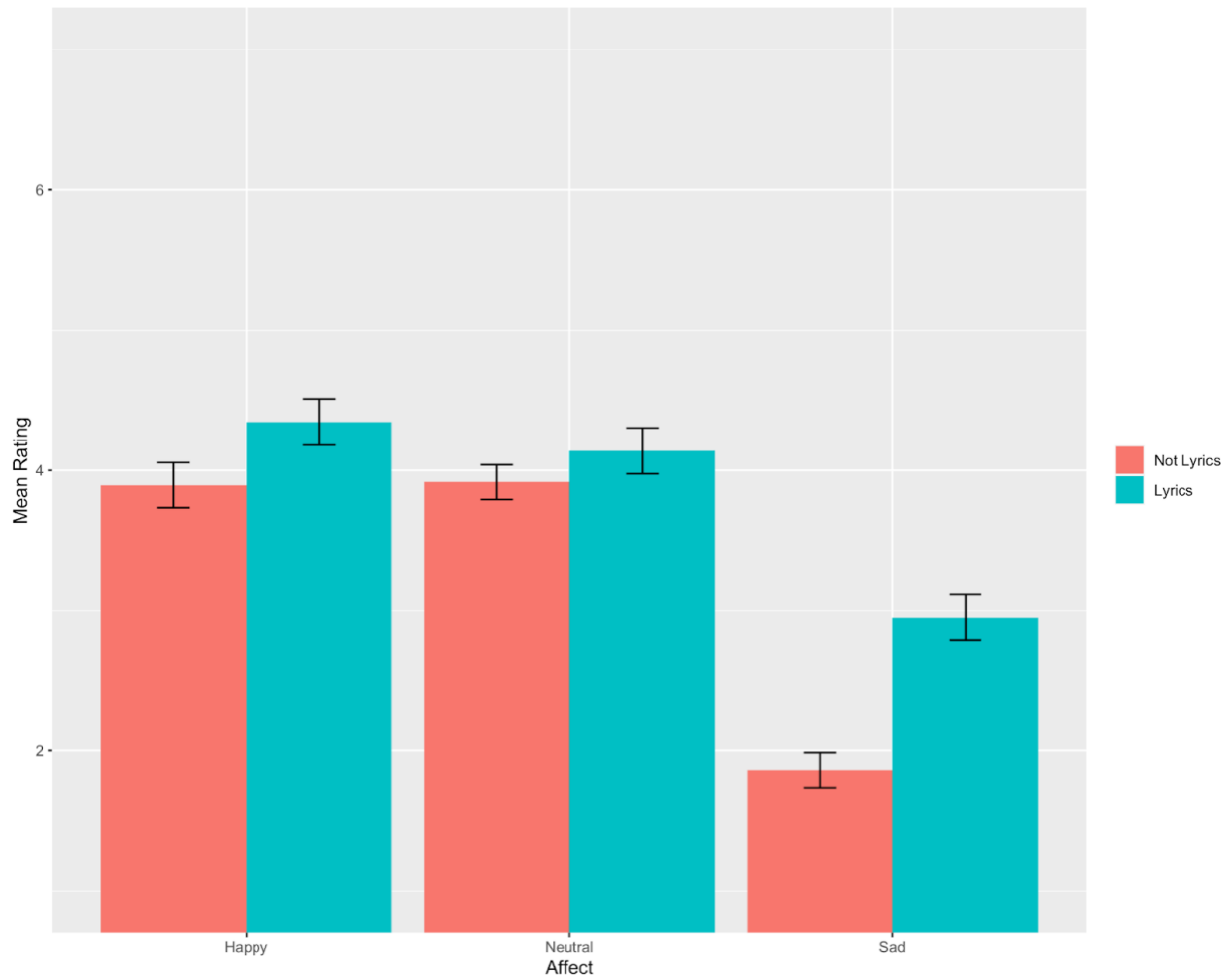


Figure 4.1: Mean ratings of liking for affect and lyrics/not-lyrics. Error bars indicate +/- 1 standard deviation.

Pairwise comparisons were conducted for each affect condition. There was no significant difference between the lyrics ($M = 4.34, SD = 1.64$) and not-lyrics ($M = 3.89, SD = 1.61$) groups in the happy conditions, $t(198) = 1.95, p = .052$. There was no significant difference between the

lyrics ($M = 4.14$, $SD = 1.64$) and not-lyrics ($M = 3.92$, $SD = 1.23$) groups in the positive neutral conditions, $t(198) = 1.08$, $p = .280$. There was, however, a significant difference between the lyrics ($M = 2.95$, $SD = 1.65$) and not-lyrics ($M = 1.86$, $SD = 1.2$) groups in the sad conditions, $t(199) = 1.95$, $p < .001$.

Discussion

The results confirm the hypothesis that people like song lyrics more than Tweets but only when the content of the text is sad. This suggests that there is something unique about the case of sad art – people enjoy the expression of the negative emotions when you simply call something art versus not-art. While previous findings have found similar art framing effects for visual stimuli, like photographs, this is the first research demonstrating that the art framing effect exists for text-based stimuli.

One limitation of this study, however, was the stimuli used. I only used songs and Tweets to test the difference between art/not-art. It is possible that there is something particularly dislikeable about reading sad content on a social media site like Twitter. In fact, a one study showed that people are less likely to share or “retweet” sad content on social media (Heimbach et al., 2015). In the next study, I tested the generalizability of these findings to other forms of art/not-art.

Study 2

In this study, I investigated whether people show greater liking for a text that expresses sadness when they think of the text as a work of art. The study tested the hypothesis that conceptualising something as art leads to increased liking even when controlling for the formal properties characteristic of works of art. Participants read one of eight texts and were either told they were reading a work of art (e.g., a monologue) or something outside the context of art (e.g., a diary entry). They were then asked to rate how much they liked what they read.

Methods

Participants. Four hundred participants (37.3% Female, $M_{age} = 36.5$ years, $SD_{age} = 11.1$ years) were recruited via Amazon's Mechanical Turk. Filters were added to ensure that participants were located in the United States and had a 99% approval rating or higher. They were paid \$.10 in exchange for taking part in this five-minute study.

Stimuli. Participants were randomly assigned to one of eight conditions in a 2 (art/not-art) x 4 (vignette pair: short story/blog post, song lyrics/tweet, monologue/diary entry, movie script/dialogue) between-participants experimental design.

For example, participants in the monologue (art) condition were told the following:

Suppose you read an excerpt of a monologue from a play written by a playwright which appeared in their new production. The playwright then posted the excerpt of their monologue on their social media page, which is what you're about to read.

Participants in the diary entry (not-art) condition were told the following:

Suppose you read an excerpt of a diary entry written by someone which was featured in their journal. This person then posted the excerpt of this diary entry on one of their social media pages, which is what you're about to read.

Participants in both the monologue and diary conditions then read the same text (taken from Plath, 1962/2000).

"Tonight I am ugly. I have lost all faith in my ability to attract males. And in the female animal that is a rather pathetic malady. My social contact is at the lowest ebb. Bill, my one link with Saturday night life, is gone, and I have no one left. No one at all. I don't care about anyone, and the feeling is quite obviously mutual. What is it that makes one attract others? Last year I had several boys who wanted me for various reasons. I was sure of my looks, sure of my magnetism, and my ego was satiated. Now, after my three blind dates – two of which flopped utterly and completely, the third has also deflated. I wonder how I ever thought I was desirable. Someone, somewhere, can you understand me a little, love me a little? For all my despair, for all my ideals, for all that – I love life. But it is hard, and I have so much – so very much to learn –

Now I'm going to be more ambitious: this week I won't share my worry about visiting with Ted, Nor my worries in general. work. Confiding in him is my worst weakness. I feel he deserves to bear my pain and share it, but I must shoulder my aloneness somehow."

See Appendix B the full list of stimuli used. Participants were then asked to answer three questions presented in a randomised order: “*How much did you enjoy reading this [text]*”, “*How much did you like reading this [text]*?”, and “*To what extent did you find reading this [text] pleasurable?*” Responses were recorded on 7-point Likert scales ranging from 1 = not at all to 7 = very much so.

Results

Analyses for this study were not pre-registered. One-hundred eighty-three participants were excluded for failing to answer all the questions and failing the manipulation and attention checks. The analyses were conducted on the remaining two hundred and seventeen participants.

First, I assessed the internal consistency of the three measures of liking (Like, Enjoy, and Pleasurable). These measures were found to have good internal consistency ($\alpha = .96$) and were therefore averaged into a single measure of Liking. Results were analysed with a linear mixed-effects regression analysis using the lme4 and lmerTest packages in R (Bates et al., 2015; Kuznetsova, Brockhoff, & Christensen, 2017), using art/not-art as a fixed factor and vignette pair as a random factor (random intercepts only). I found that liking was significantly predicted by art/not-art, $b = 1.34$, $SE = .26$ $p < .001$, $t = 5.15$, 95% CI = [.83, 1.86] (See Figure 4.2).

An ANOVA was then conducted to compare the regression model in which both art/not-art and vignette pair predicts liking to a model in which only vignette pair predicts liking. The Akaike Information Criterion (AIC) for the model with both art/not-art and vignette pair as predictors of liking (907.24) was lower than that for the model in which only vignette pair predicts liking (930.34), suggesting that it is a more appropriate model of the observed data, $X^2(1) = 25.11$, $p < .001$. An evidence ratio was calculated to determine the strength of the evidence in favour of the

more complex model (Burnham & Anderson, 2002). The evidence ratio was 64441.85 which further supported the evidence that the more complex model was a better fit for the observed data.

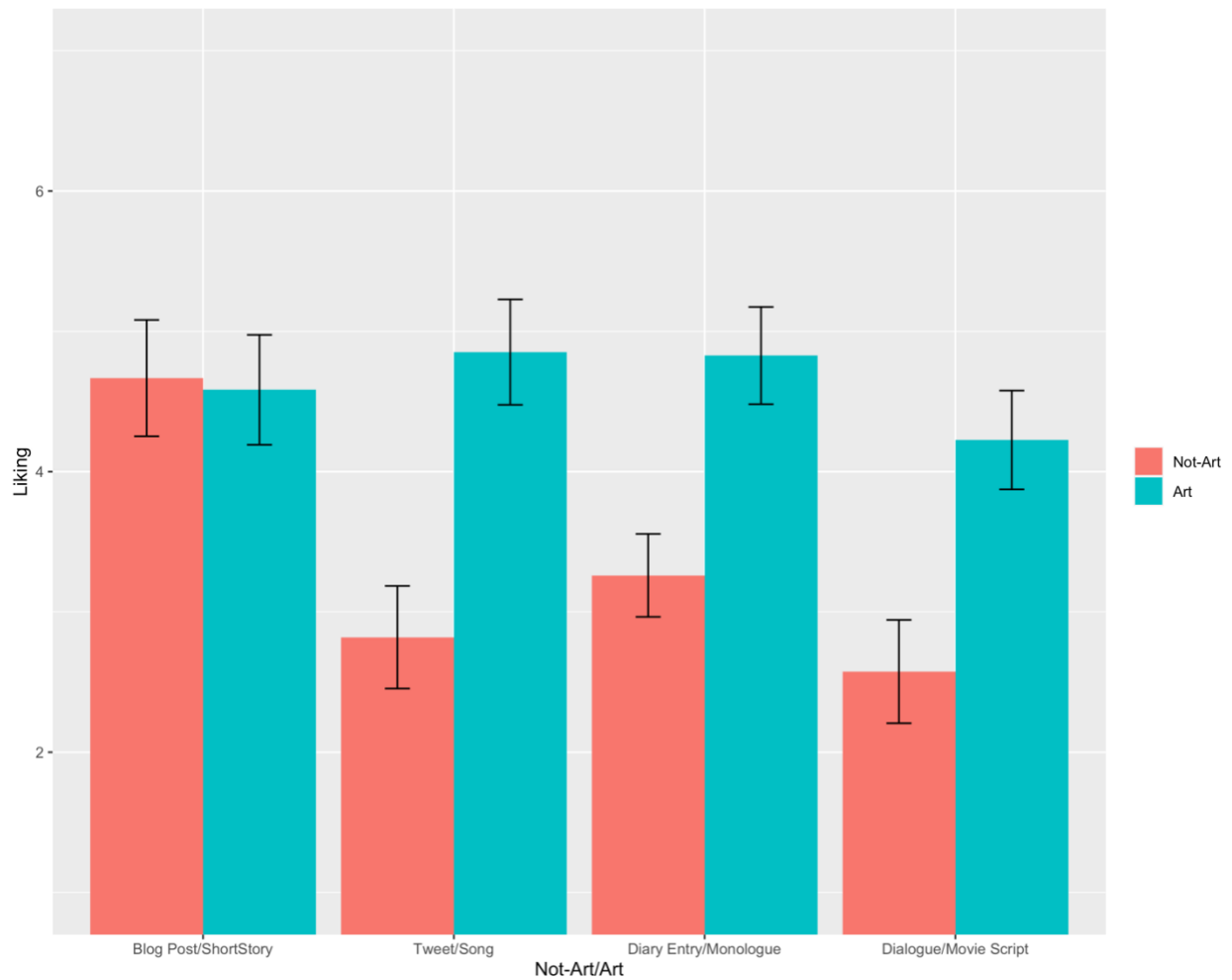


Figure 4.2: Mean ratings of liking for vignette and art/not-art. Error bars indicate ± 1 standard error.

Inspection of the pairs indicated that there was a difference between the two groups; therefore, I ran pairwise comparisons. There was no significant difference in liking between the blog post (M

= 4.67, $SD = 1.85$) and short story ($M = 4.58$, $SD = 1.92$), $t(41) = .15$, $p = .885$. There was, however, a significant difference between the art and not-art conditions for the other three vignette pairs. The tweet ($M = 2.82$, $SD = 1.79$) was rated lower on liking than the song ($M = 4.85$, $SD = 1.59$), $t(39) = -3.88$, $p < .001$. The diary entry ($M = 3.26$, $SD = 1.89$) was rated lower on liking than the monologue ($M = 4.83$, $SD = 1.80$), $t(58) = -3.44$, $p = .001$. And the dialogue ($M = 2.57$, $SD = 1.98$) was rated lower on liking than the movie script ($M = 4.23$, $SD = 2.05$), $t(60) = -3.24$, $p = .002$.

Discussion

There was a significant impact of framing something as art on liking across vignette pairs. The Tweet, diary entry, and dialogue were liked significantly less than the song, monologue, and movie script respectively. Building on previous work on the art framing effect, I found the effect of art/not-art generalises across a range of different kinds of art forms. While there was a main effect of art on liking across pairs, there was no significant difference in liking between the short story and blog post. It is possible that people may view blog posts as more art-like than some of the other not-art control conditions and the distinction between short story and blog post was not as stark as the distinction between the other vignette pairs. That said, overall, these findings support the hypothesis that people prefer sad things when they are told that what they are reading is a work of art as opposed to when they are told that it is not a work of art. This means that making someone regard a text as art influences liking irrespective of any actual differences that may characterise art and not-art text types.

Study 3

This study investigated whether the perceived fictionality of the text accounts for the difference in liking between art and not-art found in Study 1. To test this hypothesis, participants were randomly assigned to one of eight conditions in the same between-subjects design and asked to rate the extent to which they believed that the events and emotions described in the vignettes were based on reality. They were also asked how much they liked what they read. If people prefer sad art because they think that the sadness in it is not real, then there should be no difference in liking between the art and not-art conditions after controlling for perceived realness. In other words, if fictionality explains liking, then a text that is *not* seen as fictional should be liked just as much whether people think of it as art or not.

Methods

Participants. Eight hundred participants (50.6% Female, $M_{\text{age}} = 37.2$ years, $SD_{\text{age}} = 12.5$ years) were recruited via Amazon's Mechanical Turk. Filters were added to ensure that participants were located in the United States and had a 99% approval rating or higher. Participants were paid \$.10 in exchange for taking part in this five-minute study. All methods and data analyses were pre-registered (<https://aspredicted.org/blind.php?x=44j225>).

Stimuli. Participants were randomly assigned to one of eight conditions in a 2 (art/not-art) x 4 (vignette pair: short story/blog post, song lyrics/tweet, monologue/diary entry, movie script/dialogue) between-participants experimental design. They were shown the vignettes used in the previous study.

Participants were then asked to answer the same three questions about liking presented in the previous study. They were also asked two questions about perceived realness presented in a randomised order: “*To what extent do you think the author really felt the emotions expressed by the [text]?*” and “*To what extent do you think the events described in this [text] actually happened?*” All responses were recorded on 7-point Likert scales ranging from 1 = not at all to 7 = very much so.

Results

Two hundred and sixty-one participants were excluded for failing to answer all the questions and failing the manipulation and attention checks. The following analyses were conducted with the remaining five hundred and thirty-nine participants.

The three measures were combined in a scale of Liking ($\alpha = .95$). Results were analysed with a linear mixed-effects regression analysis, using art/not-art as a fixed factor and vignette pair as a random factor (random intercepts only). First, a linear mixed effect regression analysis was conducted without the perceived realness covariates. I found that liking was significantly predicted by art/not-art ($b = .95$, $SE = .16$, $p < .001$, $t=5.97$, 95% CI = [-.50, -.01] (See Figure 4.3). All pairwise comparisons are included in Table 5. As the table shows, there was a significant difference between the art and not-art conditions within each vignette pair for all pairs except the short story/blog post pair.

I conducted an ANOVA to compare the regression model with art/not-art as a predictor and without art/not-art as a predictor of liking. The AIC for the more complex model (2196.0) was lower than that for the model in which only vignette pair predicts liking (2228.5), suggesting that it is a more appropriate model of the observed data, $X^2(1) = 34.58$, $p < .001$. The evidence ratio

was 4614706 which further supported the evidence that the more complex model was a better fit for the observed data.

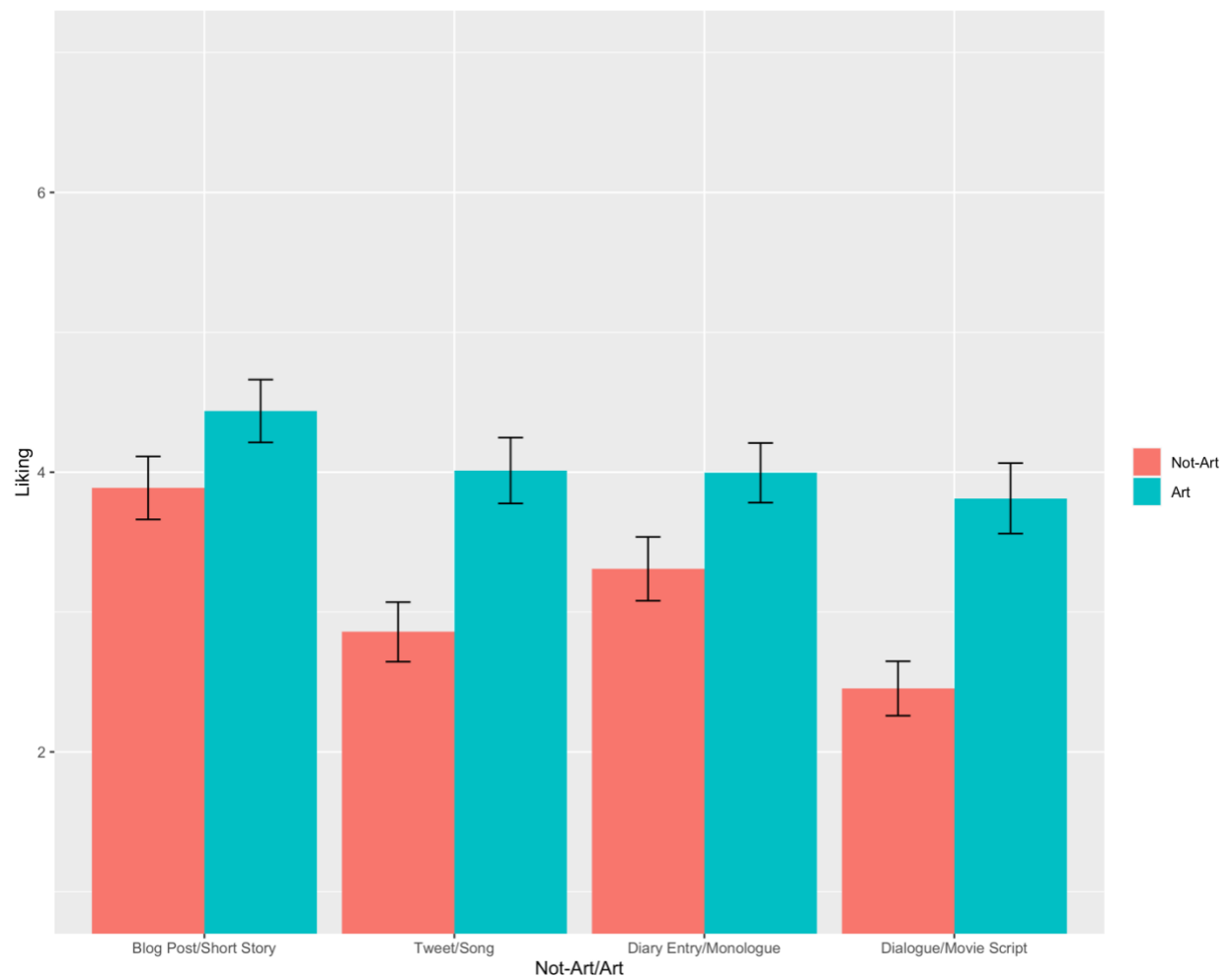


Figure 4.3: Mean ratings of liking for vignette and art/not-art. Error bars indicate +/- 1 standard error.

Table 5: Pairwise comparisons of art vs. not-art conditions for each vignette pair

Vignette Pair	Text Type	<i>M</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Short Story/Blog Post	Art	4.44	.23	123.89	-1.73	.086
	Not-Art	3.89	.23			
Song/Tweet	Art	4.01	.24	117.33	-3.63	<.001
	Not-Art	2.86	.21			
Monologue/Diary Entry	Art	4.00	.21	136.76	-2.20	.029
	Not-Art	3.31	.23			
Movie Script/Dialogue	Art	3.81	.25	136.34	-4.27	<.001
	Not-Art	2.45	.20			

Then, a second linear mixed effect regression analysis was conducted with covariates. This analysis was the same as the previous one except that the two perceived realness questions were entered as fixed factors. I found that there was a significant effect of perceived realness of the emotions such that the more real people perceived the emotions to be the more they liked the text, $b = .17$, $SE = .07$, $p = .013$, $t = 2.49$, 95% CI = [.04, .30] (see Figure 4.4).

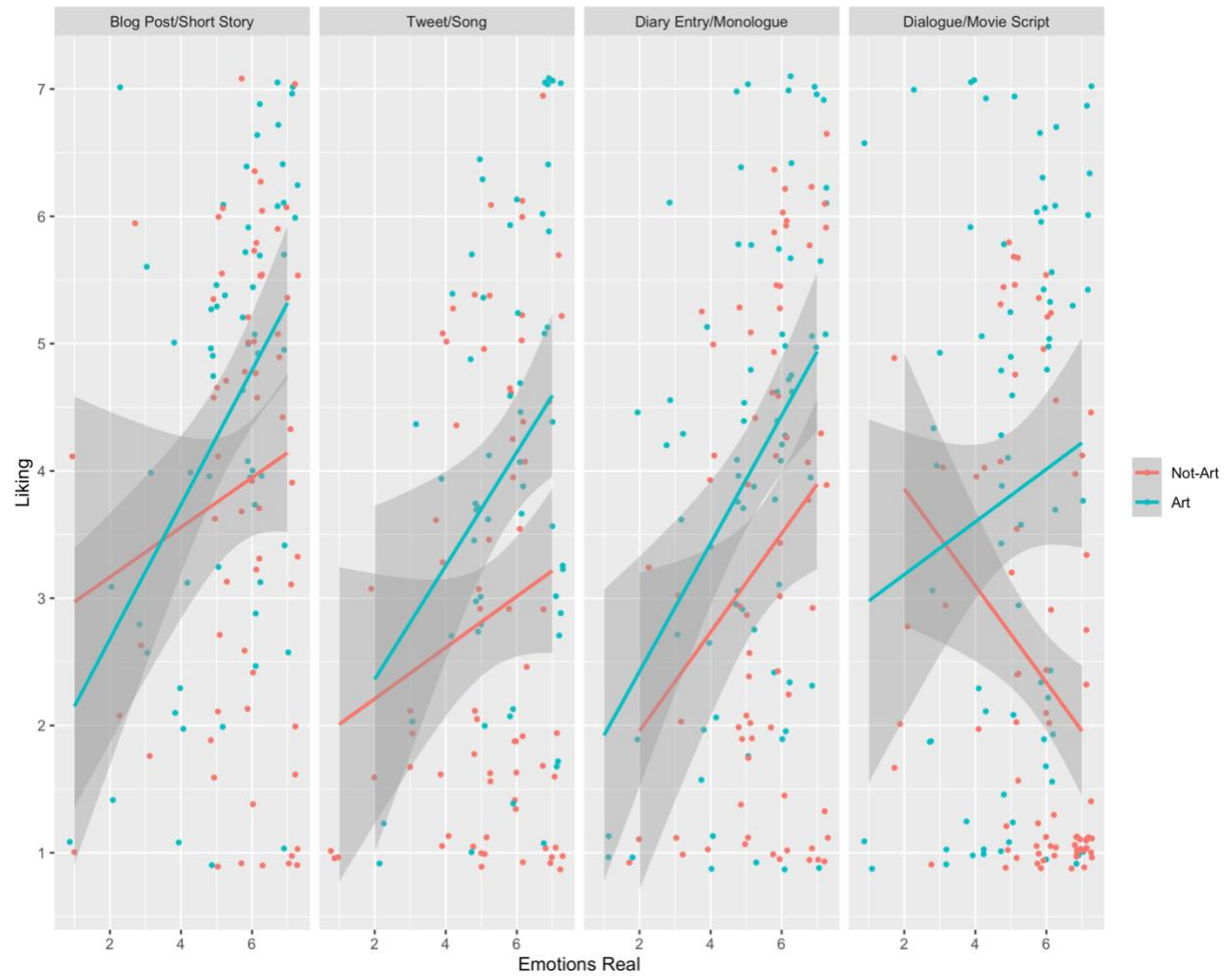


Figure 4.4: Scatterplot of perceived realness of emotions and liking by art/not-art and vignette pair.

There was also a significant effect of and perceived realness of the events such that the more real people perceived the events to be the more they liked the text, $b = .12$, $SE = .06$, $p = .049$, $t = 1.97$, 95% CI = [.00, .25] (see Figure 4.5).

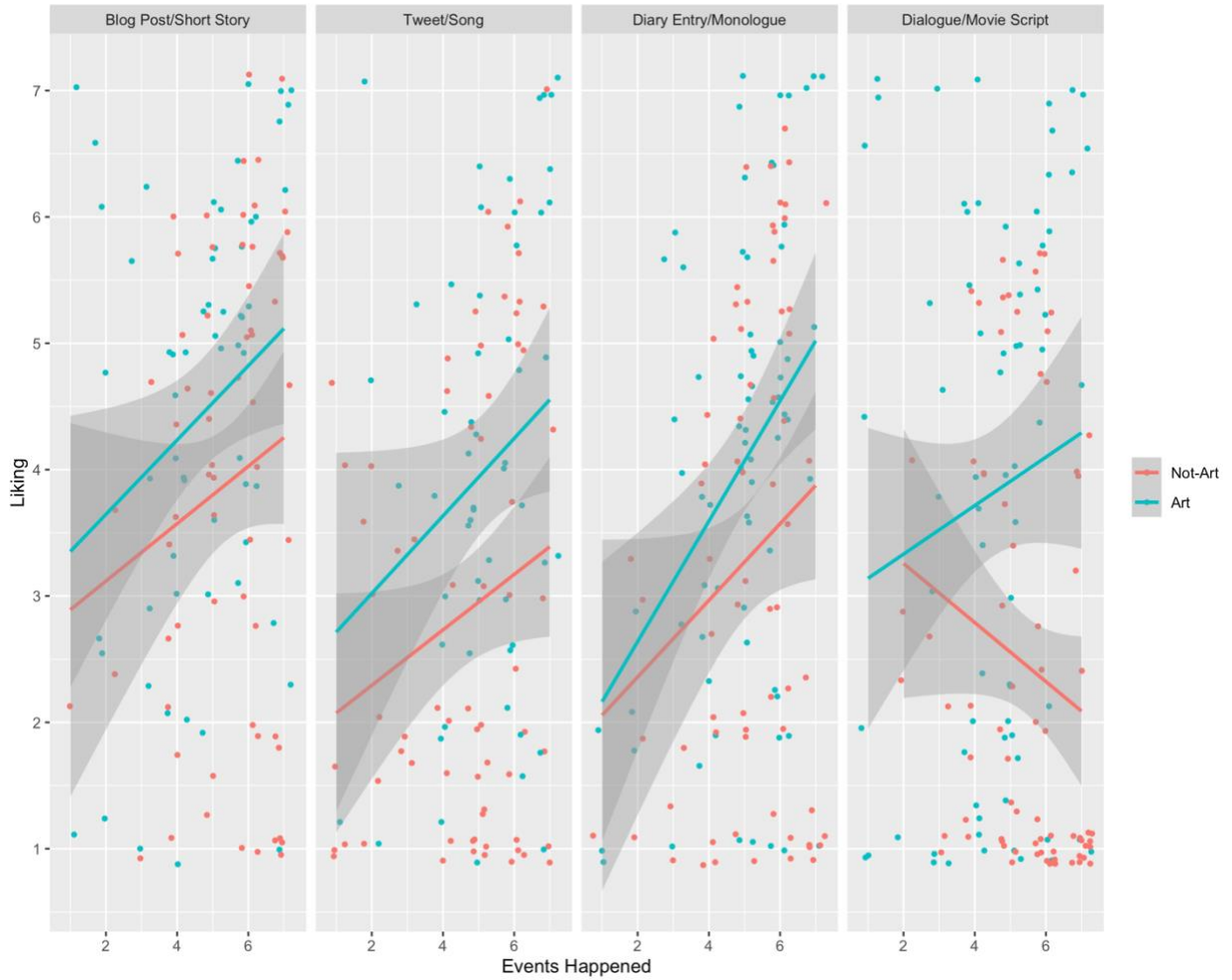


Figure 4.5: Scatterplot of perceived realness of events and liking by art/not-art and vignette pair.

More importantly, there was a significant effect of liking on art/not-art, even after controlling for perceived realness of emotions and events, $b = 1.03$, $SE = .16$, $p < .001$, $t=6.61$, 95% CI = [.73, 1.34]. These results are particularly striking because, as can be seen in Figure 4.5, there is an overall preference for realness and yet, there is *still* a preference for art over not-art.

I conducted an ANOVA to compare the regression model with perceived realness of emotions and realness of events as covariates and a regression model without the perceived realness of

emotions and events as covariates. The Akaike Information criterion for the model with both art/not-art and vignette pair as predictors of liking (2196.0) was lower than that for the model in which only vignette pair predicts liking (2175.0), suggesting that it is a more appropriate model of the observed data, $X^2(2) = 24.97$, $p < .001$. An evidence ratio was calculated to determine the strength of the evidence in favour of the more complex model (Burnham & Anderson, 2002). The evidence ratio was 691.96 which further supported the evidence that the more complex model was a better fit for the observed data.

These results were surprising so I conducted further exploratory analyses to explore the role of realness in these judgments. First, I tested the effect of art/not-art (fixed factor) and vignette pair (random factor) on perceived realness of emotions. There was a significant effect of art/not-art on perceived realness of the emotions such that people think that people think the emotions in art are less real than in not-art, $b = -.26$, $SE = .12$, $p = .039$, $t = -2.07$, 95% CI = $[-.50, -.01]$ (See Figure 4.6).

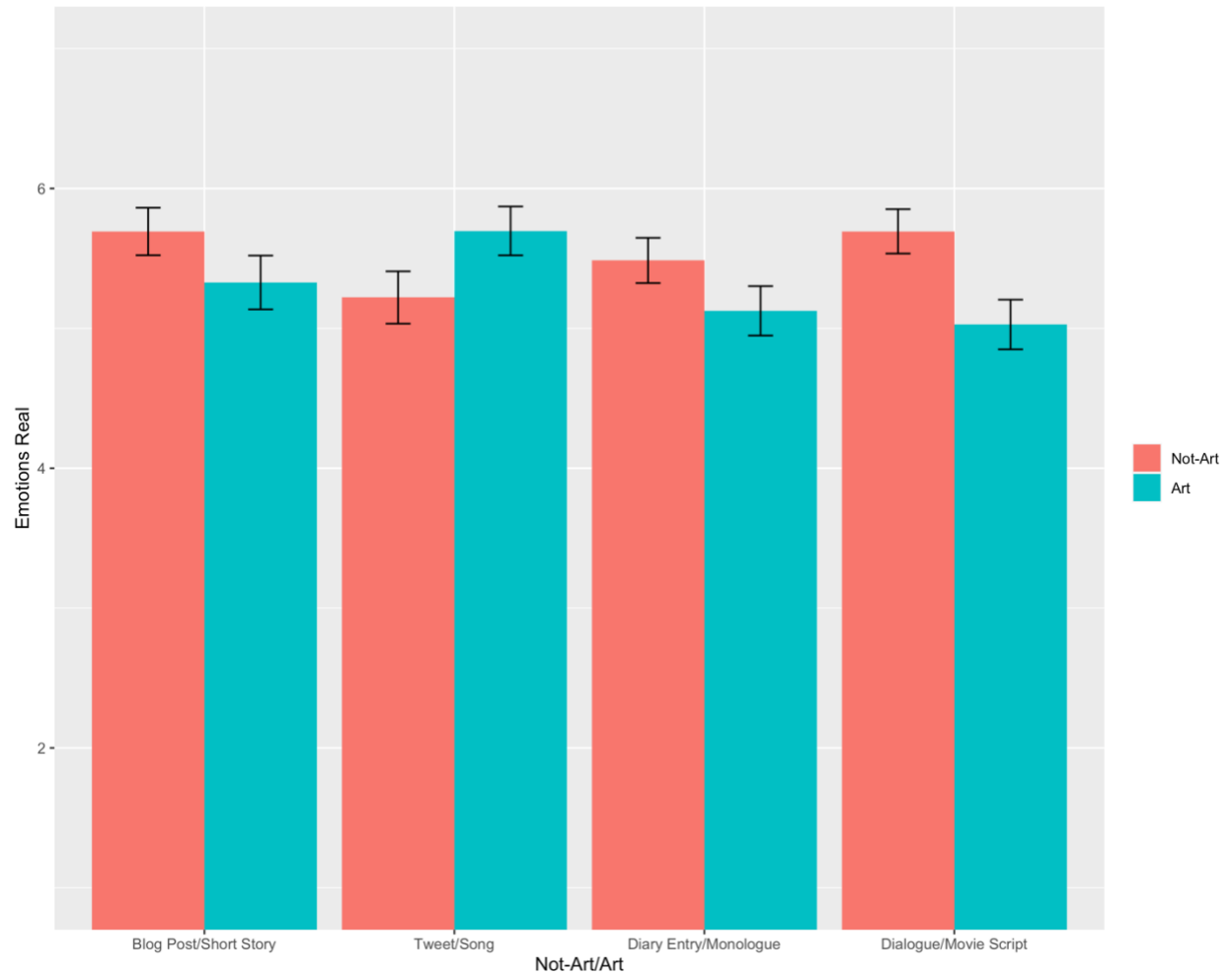


Figure 4.6: Mean ratings of perceived realness of emotions for each vignette pair and art/not-art respectively. Error bars indicate +/- 1 standard error.

I also found that there was a significant effect of perceived realness of the events such that people think that the events in art are less real than in not-art, $b = -.34$, $SE = .13$, $p = .011$, $t = -2.55$, 95% $CI = [-.60, -.08]$ (See Figure 4.8).

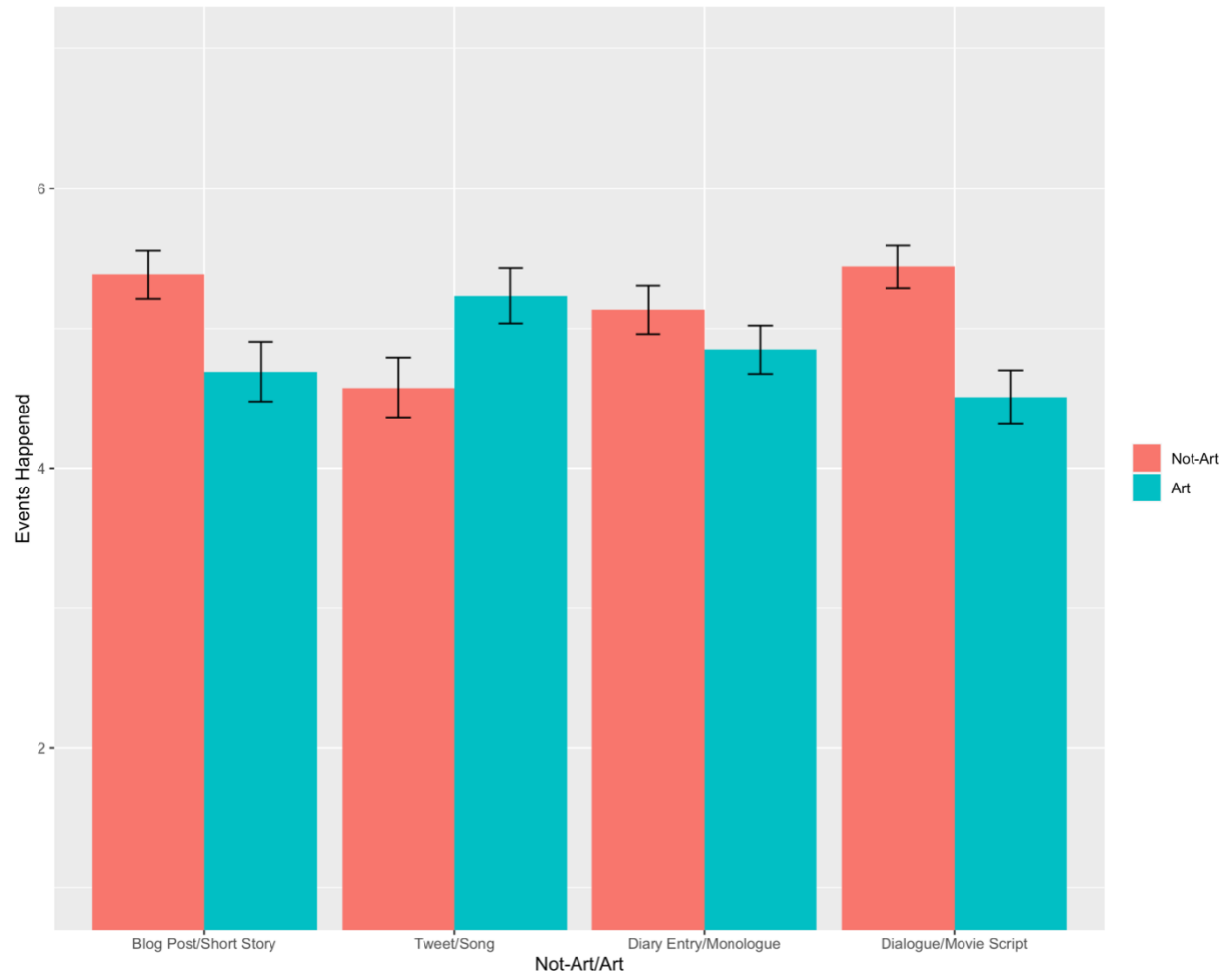


Figure 4.7: Mean ratings of perceived realness of events for each vignette pair and art/not-art respectively. Error bars indicate +/- 1 standard error.

To determine if there was an indirect effect of art/not-art on liking, I conducted mediation analyses using the mediation package in R (Tingley, Yamamoto, Hirose, Keele, & Imai, 2014). One mediation analysis looked at judgements of the realness of emotion and the other looked at judgement of the realness of the events.

I first looked at judgements of the realness of the emotions. I examined the average causal mediation effect (ACME) and the average direct effect (ADE). There was a significant direct

effect, $ADE = 1.01$, $p < .001$, $CI [.70, 1.32]$. There was also a significant indirect effect, $ACME=0.06$, $p = .04$, $CI [-0.14, 0.00]$. However, this indirect effect was in the opposite direction of the total effect. So, overall, participants showed greater liking for sad art than for sad not-art, but the indirect effect went in the opposite direction i.e., participants perceived art as less likely to be real than not-art and they actually like sad emotions more when they perceive those emotions to be real than when they perceive the sad emotions to be fictional. As a consequence, the total effect was smaller than the direct effect because it had to compensate for the negative indirect effect, Total Effect = .94, $p < .001$, $CI [.63, 1.27]$. Given that the ACME was significant but in the opposite direction, we can conclude that perceived realness of emotions cannot explain the relationship between art/not-art and liking (see Figure 4.8 for the mediation diagram).

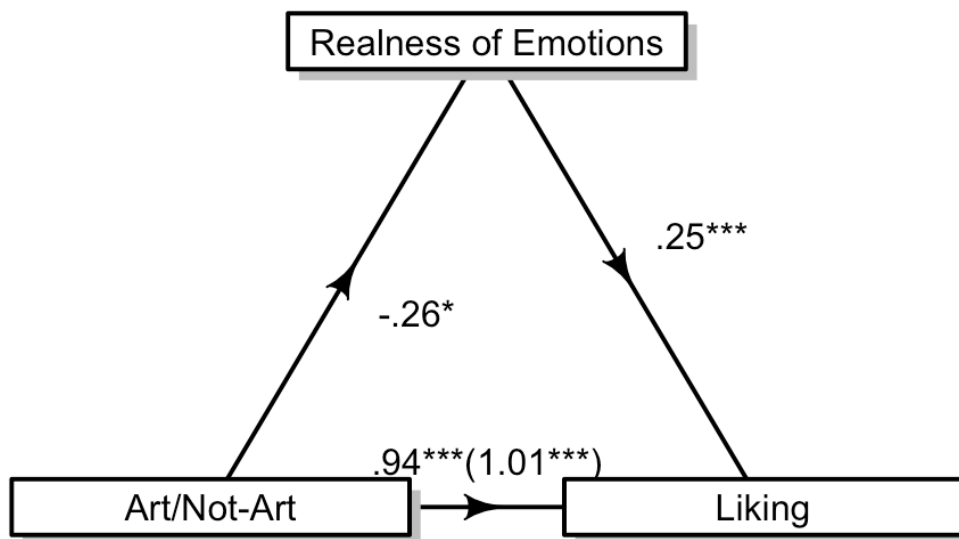


Figure 4.8: Mediation model of the effect of art/not-art on liking, mediated by realness of emotions, where $* = p < .05$, $** = p < .01$, $*** = p < .001$.

Next, I conducted a mediation analysis with the same method with perceived realness of events as a mediator. Results indicated a significant direct effect, significant ADE = 1.02, $p < .001$, CI [.74, 1.34]. Like in the previous model, there was also a significant indirect effect, ACME = -0.08, $p = .004$, CI [- 0.15, - 0.02], and this indirect effect was in the opposite direction of the total effect. Once again, this was a striking result because it showed that the relationship between art/not-art and perceived realness of emotions is negative while the relationship between perceived realness of events and liking is positive i.e., the art/not-art → perceived realness of events path and the perceived realness of events → liking path of the mediation model are in opposite directions. As a result, the total effect was smaller than the direct effect because it had to compensate for the negative indirect effect, Total Effect = .95, $p < .001$, CI [.66, 1.28]. Because the ACME was significant but in the opposite direction, we can conclude that perceived realness of events does not explain the relationship between art/not-art and liking (see Figure 4.9 for mediation diagram).

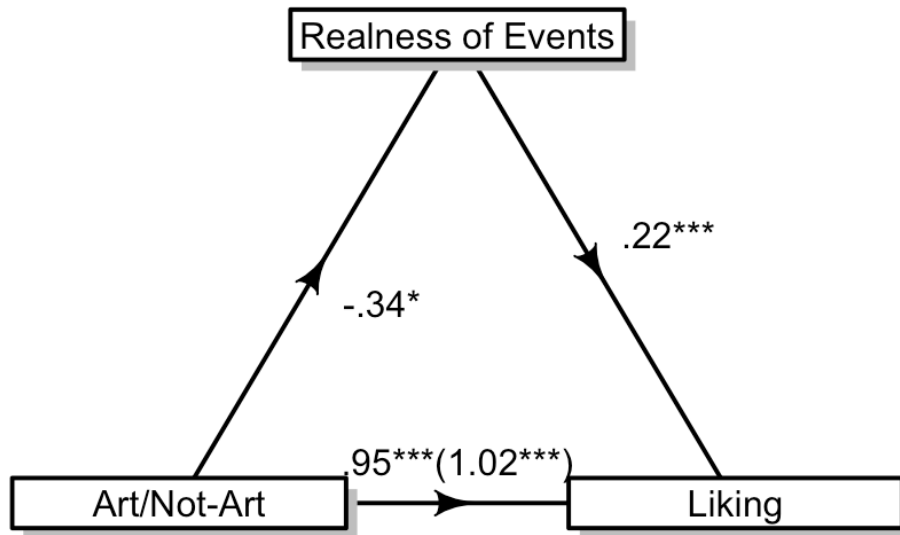


Figure 4.9: Mediation model of the effect of art/not-art on liking, mediated by realness of events, where $*$ = $p < .05$, $**$ = $p < .01$, $***$ = $p < .001$.

In both models, the indirect effect was in the opposite direction of the total effect. The path from art/not-art → perceived realness of emotions/perceived realness of events is negative but the path from perceived realness of emotions/perceived realness of events is positive. In other words, participants perceive art to be less real than not art but they like sad art more than sad not-art to the extent that they believe the sad emotions and events described are real.

Discussion

Like in the previous study, there was an overall preference for sad vignettes that are described as art over sad vignettes that are described as not-art. Strikingly, however, there was still a significant effect of art/not-art on liking, even after controlling for perceived realness of events and emotions.

The effect of perceived realness of emotions and events actually went in the opposite direction. Participants thought that the emotions and events in a text were less likely to be real when the text was framed as art, but they liked the text *more* when they thought that the sad emotions and events described in the text were real. So, for example, when participants read the lyrics of a song, they liked this song more to the extent that they thought that the sad emotions and events it described were real and not fictional. In sum, fictionality *cannot* explain liking for sad art. Despite the overall preference for real events and emotions, people still prefer sad art over sad not-art texts. In the next study, I explore an alternative explanation for the effect of art/not-art on liking.

Study 4

Study 3 found that perceived realness of emotions and events did not account for the difference in liking between art and not-art. In Study 4, I tested if the concept of appropriation might explain why people enjoy the expression of sadness more in the art conditions. I predicted that people would enjoy the expression of negative emotions to the extent that they could appropriate them and that people would appropriate to a greater extent in the art conditions. To test this hypothesis, participants were randomly assigned to one of eight conditions in the same between-subjects design, read the same texts as in the previous two studies, and were asked how much they liked what they read. In this study, participants were also asked questions about appropriation, the extent to which they felt that what they read expressed or gave voice to their own thoughts and feelings. I predicted that appropriation would mediate the main effect of art/not-art on liking.

Methods

Participants. Four hundred participants (49.0% Female, $M_{\text{age}} = 38.7$ years, $SD_{\text{age}} = 11.7$ years) were recruited via Amazon's Mechanical Turk. Filters were added to ensure that participants were located in the United States and had a 99% approval rating or higher. They were paid \$.10 in exchange for taking part in this five-minute study. All methods and analyses were pre-registered (<https://aspredicted.org/blind.php?x=8qw6jp>).

Stimuli. Participants were randomly assigned to one of eight conditions in a 2 (art/not-art) x 4 (vignette pair: short story/blog post, song lyrics/tweet, monologue/diary entry, movie script/dialogue) between-participants experimental design. They were shown the vignettes used in the previous study.

Participants then answered the same three questions about liking presented in a randomised order as in the previous studies. They were also asked three questions about appropriation, presented in a randomised order: “*To what extent do you feel that this [text] expresses your own thoughts and feelings?*”, “*To what extent do you feel the words in this [text] as coming from yourself?*” and “*To what extent does this [text] give voice to your own thoughts and feelings?*” (scale items taken from definitions of appropriation in Riberio, 2014 and Levinson, 1982; 2005). All responses were recorded on 7-point Likert scales ranging from 1 = not at all to 7 = very much so.

Results

One hundred and fifty-one participants were excluded for failing to answer all the questions and failing the manipulation and attention checks. The following analyses were conducted with the remaining two hundred and forty-nine participants.

The three liking measures were combined in a scale of Liking ($\alpha = .96$). The three appropriation measures were combined in a scale of appropriation ($\alpha = .96$). Results were analysed using linear mixed-effects models, with art/not-art as a fixed factor and vignette pair as a random factor (random intercepts only). I found that liking was significantly predicted by art/not-art ($b = 1.23$, $SE = .23$, $p < .001$, $t = 5.27$, 95% CI = [.77, 1.69] (See Figure 4.10). See Table 6 for pairwise comparisons.

I conducted an ANOVA to compare the regression model with art/not-art as a predictor and without art/not-art as a predictor of liking. AIC for the more complex model (1018.5) was lower than that for the model in which only vignette pair predicts liking (1043.0), suggesting that it is a

more appropriate model of the observed data, $X^2(1) = 26.49$, $p < .001$. The evidence ratio was 113778.3 which further supported the evidence that the more complex model was a better fit for the observed data.

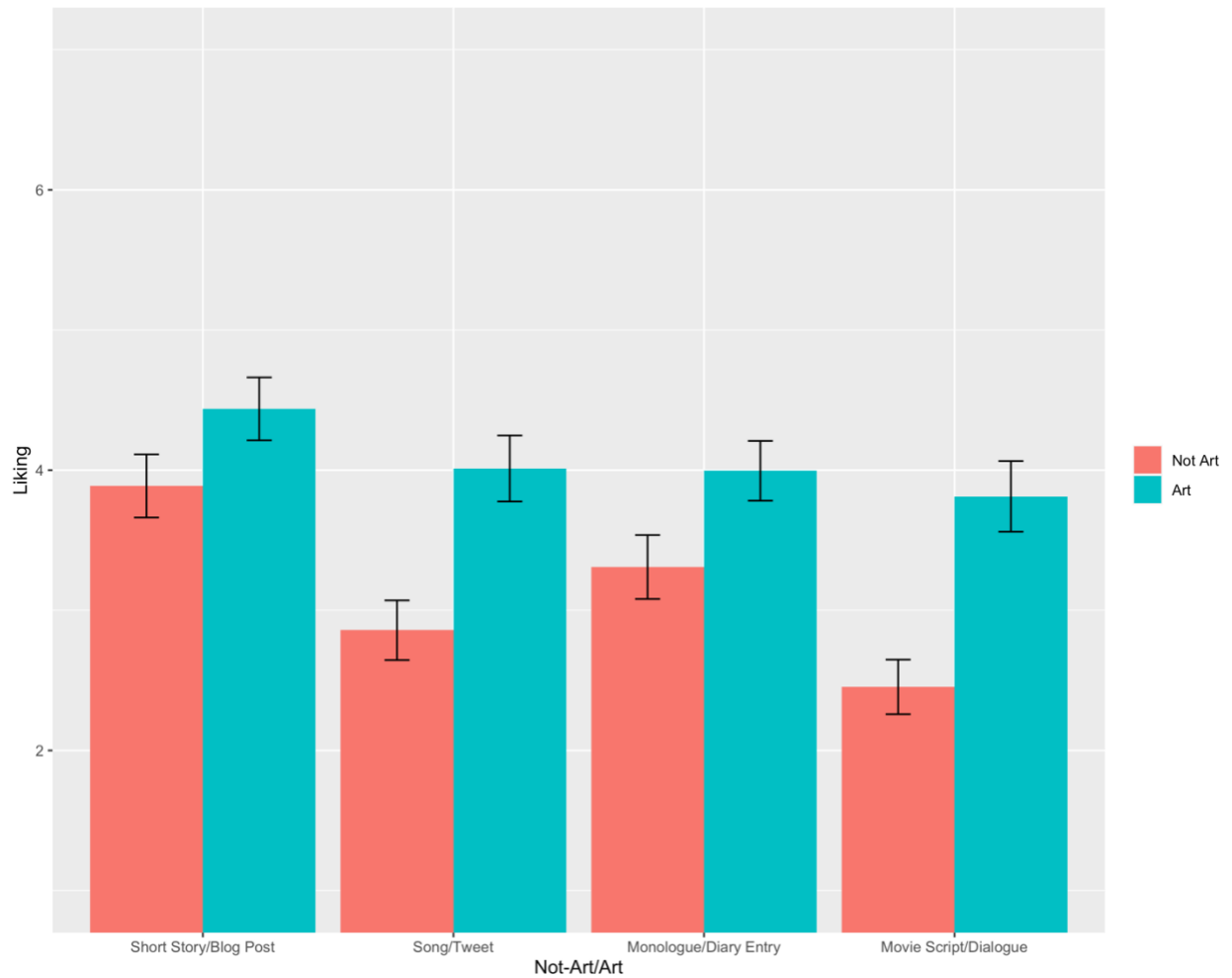


Figure 4.10: Mean ratings of liking for vignette and art/not-art. Error bars indicate +/- 1 standard error.

Table 6: Pairwise comparisons of art vs. not-art conditions for each vignette pair

Vignette Pair	Text Type	<i>M</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Short Story/Blog Post	Art	4.53	.33	60.07	-1.66	.103
	Not-Art	3.79	.30			
Song/Tweet	Art	4.76	.40	49.84	-3.47	.001
	Not-Art	3.08	.33			
Monologue/Diary Entry	Art	4.88	.31	62.81	-2.02	.048
	Not-Art	3.97	.32			
Movie Script/Dialogue	Art	4.21	.31	59.39	-3.47	<.001
	Not-Art	2.57	.32			

Next, I tested the effect of art/not-art on appropriation, with the vignette pair as a random factor. I found that there was a significant effect of art/not-art on appropriation ($b = .77$, $SE = .25$, $p = .003$, $t=3.04$, 95% CI = [.27, 1.27]). Then, a mediation was conducted to test if appropriation mediated the effect of art/not-art on liking. I examined the ACME and the average direct effect ADE. Results indicated a significant indirect effect, ACME = .50, $p < .001$, CI [.165, .83]. I also found evidence for a significant ADE = .75, $p < .001$, CI [.41, 1.08]. Overall, the significant ACME indicates that appropriation partially mediated the relationship between art/not-art and liking (See Figure 4.11).

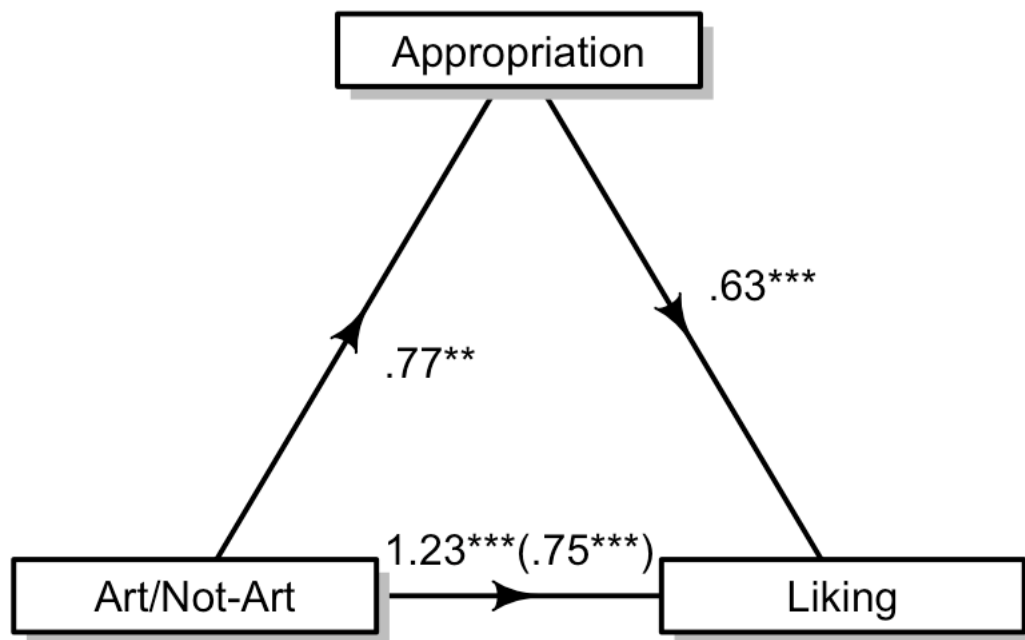


Figure 4.11: Mediation model of the effect of art/not-art on liking, mediated by appropriation, where $*$ = $p < .05$, $**$ = $p < .01$, $***$ = $p < .001$.

Discussion

As hypothesized, appropriation mediated the main effect of art/not-art on liking. Importantly, and as hypothesized, I found that art/not-art predicts the extent to which people appropriate. Finally, I also found empirical evidence for the relationship between appropriation and liking proposed in the philosophy of art literature. Together, these results show that appropriation (at least partially) explains why people enjoy the expression of sadness in art.

One potential confound common to Studies 2 - 4 is that the participants in the sad art conditions were told that the text was written by an artist (author, playwright, screenwriter, and singer-songwriter) while participants in the sad not-art conditions were told that the text was written by “someone”. This presents a potential confound as participants might have assumed that professional artists create higher quality works, thereby influencing liking scores. The next study eliminated this confound.

Study 5

In this study, I controlled for a possible confound in the design of studies 2-4. The studies thus far were framed such that the people writing the texts in the art conditions were artists (e.g., author, playwright, screenwriter, singer-songwriter), while the people writing the texts in the not-art conditions were not specified by profession - they were just referred to as “someone” who wrote the text. This presents a potential confound as participants might have assumed that professional artists create higher quality works, thereby influencing liking scores. To control for inferred quality differences due to the author between the art and not-art conditions, participants read the same four texts but this time they were just told that “someone” wrote the text in all conditions. They were then asked to rate how much they liked what they read. I predicted that there would still be a main effect of art/not-art on liking.

Methods

Participants. Six hundred participants (37.3% Female, $M_{age} = 34.3$ years, $SD_{age} = 11.7$ years) were recruited via Prolific Academic. They were paid \$.85 in exchange for taking part in this three-minute study. All methods and analyses were pre-registered (<https://aspredicted.org/blind.php?x=h2km4j>).

Stimuli. Participants were randomly assigned to one of eight conditions in a 2 (art/not-art) x 4 (vignette pair: short story/blog post, song lyrics/tweet, monologue/diary entry, movie script/dialogue) between-participants experimental design.

For example, participants in the monologue (art) condition were told the following:

Suppose you read an excerpt of a monologue from a play written by someone which appeared in their new production. This person then posted the excerpt of their monologue on their social media page, which is what you're about to read.

Participants in the diary entry (not-art) condition were told the following:

Suppose you read an excerpt of a diary entry written by someone which was featured in their journal. This person then posted the excerpt of this diary entry on one of their social media pages, which is what you're about to read.

Participants were then asked to answer the same three questions about liking presented in the previous studies. Responses were recorded on 7-point Likert scales ranging from 1 = not at all to 7 = very much so.

Results

Thirty-five participants were excluded for failing to answer all the questions and failing the manipulation and attention checks. The following analyses were conducted with the remaining five hundred and sixty-five participants.

The three measures were combined in a scale of Liking ($\alpha = .96$). First, a linear mixed effect regression analysis was conducted, using art/not-art as a fixed factor and vignette pair as a random factor (random intercepts only). I found that liking was significantly predicted by art/not-art and vignette pair, $b = 1.49$, $SE = .14$, $p < .001$, $t = 10.98$, 95% CI = [1.23, 1.76] (see Figure 4.12). I then conducted an ANOVA to compare the regression model in which both art/not-art and vignette pair predicts liking to a model in which only vignette pair predicts liking. The AIC for the model with both art/not-art and vignette pair as predictors of liking (2160.0) was lower than that for the model in which only vignette pair predicts liking (2267.5), suggesting that it is a more appropriate model of the observed data, $X^2(1) = 109.46$, $p < .001$. The evidence ratio was $6.90e^{22}$.

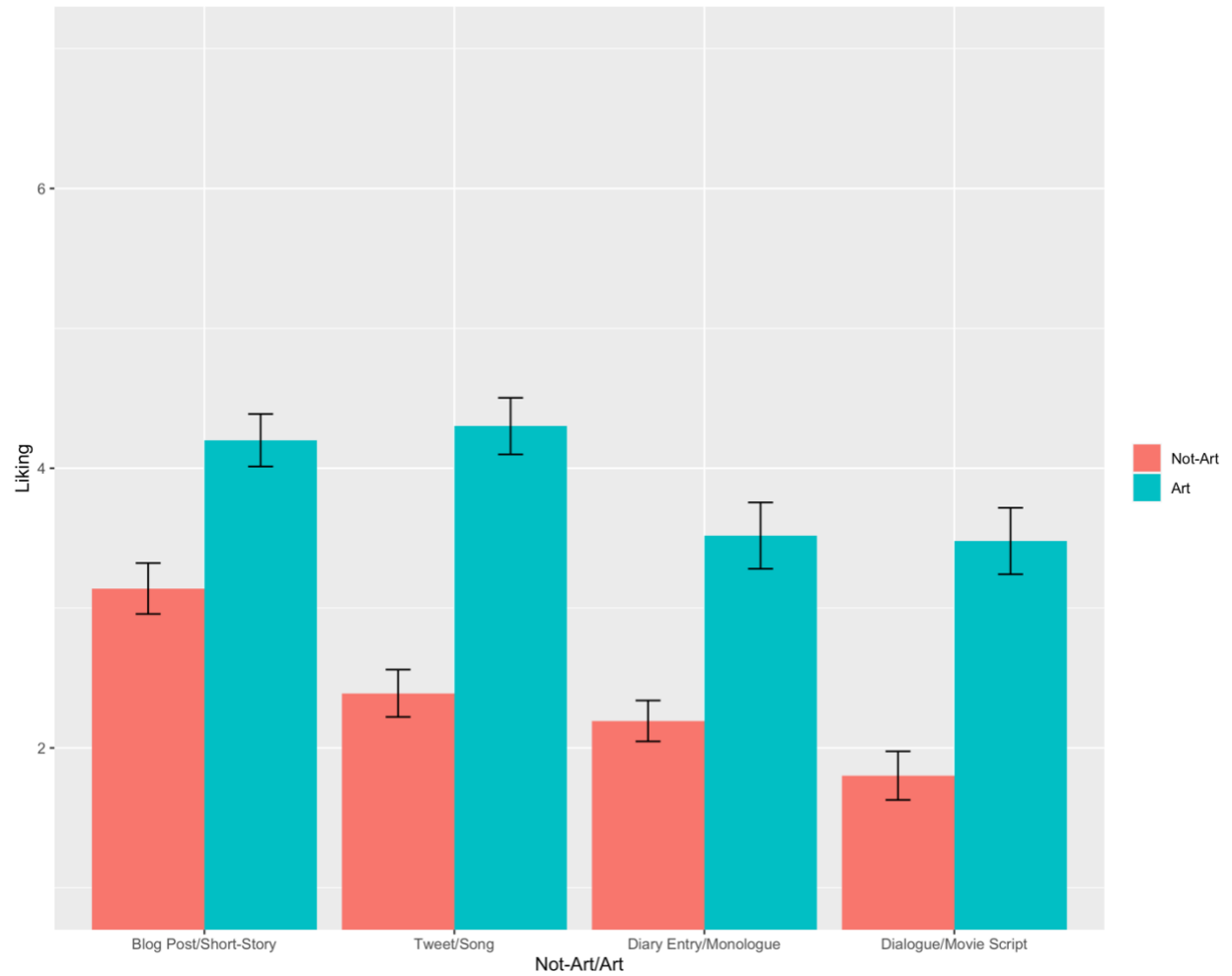


Figure 4.12: Mean ratings of liking for vignette and art/not-art. Error bars indicate ± 1 standard error.

Inspection of the pairs indicated that there was a difference between the two groups; therefore, I ran pairwise comparisons. See Table 7 for a full list of pairwise comparisons.

Table 7: Pairwise comparisons of art vs. not-art conditions for each vignette pair

Vignette Pair	Text Type	<i>M</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Short Story/Blog Post	Art	4.20	.19	141.51	-4.05	<.001
	Not-Art	3.14	.18			
Song/Tweet	Art	4.30	.20	136.42	-7.25	<.001
	Not-Art	2.39	.17			
Monologue/Diary Entry	Art	3.52	.24	108.57	-4.75	<.001
	Not-Art	2.19	.15			
Movie Script/Dialogue	Art	3.48	.24	119.00	-5.70	<.001
	Not-Art	1.80	.17			

Discussion

The results were replicated and there was once again a significant effect of art/not-art on liking across vignette pairs even after controlling for the author of the stimuli. The blog post, Tweet, diary entry, and dialogue were liked significantly less than the short story, song, monologue, and movie script respectively. Unlike in Studies 2 – 4, this study found that there was a significant difference in liking between the short story and blog post conditions. These findings suggest that the difference in liking is not because the author was explicitly described as an artist. The effect continues to emerge even when that confound is eliminated.

General Discussion

The five studies reported in this chapter were designed to test the hypothesis that people prefer the expression of sadness in art more than in not-art contexts. Using the art framing paradigm, these studies investigated whether merely framing the exact same text as a work of art versus not-art influences liking for the text and discussed some possible explanations for this difference in liking. Study 1 demonstrated that people prefer art over not-art but only in cases where the content of the text is sad. Study 2 tested the generalizability of this finding and found that there is an overall preference for the expression of sadness in art over not-art across a variety of different art forms. Studies 3 and 4 explored potential hypotheses as to why this effect arises. Study 3 ruled out the previously posited hypothesis that the perceived fictionality of art explains liking of sad art. Study 4 found that the difference in liking can be explained by the extent to which people appropriate the negative emotions expressed in the text. Specifically, people tend to appropriate sadness when it is expressed in a work of art and this predicts liking for sad art. Study 5 eliminated a potential confound in the study design and replicated the results from the previous four studies even after controlling for the author who wrote the text. Taken together, these findings reveal that people do indeed prefer the expression of sadness in art over not-art and that this difference in liking can be explained by appropriation.

These findings shed light on the psychological mechanisms underlying the preference for sad art. They provide the first empirical evidence for the notion that appropriation increases enjoyment of sad art. Furthermore, they provide evidence that people tend to appropriate sadness to the extent that they conceptualise the work as art. This result is striking as it suggests that licence to appropriate might be a fundamental property of what art is.

Negative emotion

The present studies suggest that there is a difference in liking between art and not-art but only when the content of the work is sad. It is likely, however, that this effect arises for other emotions as well. The philosophy of art literature suggests this difference in liking arises for the expression of an array of different negative or “painful” emotions (Carroll, 1990; Smuts, 2007; Strohl, 2019). Strohl (2019) proposes four cases of painful emotion which we seem to enjoy in art: tragedy, atrocity, horror, and noisy music. Strohl includes noisy music because he suggests that punk, metal, and avant-garde jazz often create an atmosphere of agitation which is, somehow, enjoyable in art. Other negative emotions that we seem to enjoy in art are fear, disgust, and pity (Carroll, 1990; Smuts, 2007). The results of the present studies suggest that the expression of any of these negative emotions may be enjoyable in art because they can be appropriated in a way that they cannot be in real life.

That said, we also seem to enjoy the expression of certain kinds of positive emotions in art that we do not enjoy in real life. For example, we do not enjoy listening to people brag about their successes and lifestyles in real life but we appear to enjoy boasting in art contexts. Many hip-hop and rap singers sing about their extravagant lifestyles and wealth (Fonseca, 2019). It would be uncomfortable and unpleasant to hear someone brag about those things in real life but it is somehow enjoyable when conveyed in song. It is likely that the concept of appropriation can also explain why we like bragging in music but not in real life. When Kanye West sings, “*I am a God/ So hurry up with my damn massage/ In a French-ass restaurant/ Hurry up with my damn croissants*”, you are not supposed to think about Kanye West ordering croissants and getting massages in France (West, 2013). Instead, you are supposed to think about yourself living the life of the rich and famous, getting massages and impatiently waiting for your croissants to be served.

It is possible, therefore, that this preference for art over not-art is instead true for the expression of any kind of emotion that you are not allowed to express in real life. In other words, there should be no difference in liking between art and not-art except in cases where the emotions expressed are considered inappropriate in everyday life (Kramer & Hess, 2002). All cultures have norms of emotional expression which define the appropriateness of emotional displays (Kramer & Hess, 2002). Research shows that people think that the expression of negative emotions like anger, fear, disgust, and sadness is inappropriate (Matsumoto, 1993). However, research also shows that certain intense expressions of positive emotions are also deemed inappropriate in certain contexts (Aune, Aune, & Buller, 1994; Huston-Comeaux & Kelly, 2002; Kramer & Hess, 2002; Matsumoto, 1993). It is possible that people may enjoy the expression of a range of different kinds of emotions like sadness, disgust, self-satisfaction, and treacly love in art but not in everyday life.

Hence, the prediction based on these current experiments is that conceptualising something as art may give you licence to appropriate the emotions expressed in the art and enjoy it. Specifically, I would predict that the difference in liking between art versus not-art will only arise in cases where the emotion expressed in the work is deemed inappropriate if displayed in real life.

What about art leads to appropriation?

The present studies suggest that conceptualising something as art, specifically, allows one to appropriate. While it is possible that people appropriate in not-art contexts, Study 4 suggests that there is something special about art that allows people to appropriate. This hypothesis arises from the literature on the art schema, suggesting that art triggers certain psychological constructs which allow people to engage with art in a way that's different to engaging with not-art objects. An art

schema is a mental representation of what art is, all the properties associated with it, and appropriate responses to it (Wagner et al., 2014). Research suggests that the art schema may imply several things. Firstly, calling something art might imply that the audience can psychologically distance themselves from the object, allowing for abstraction and aesthetic appreciation (Cupchick, 2002). Secondly, art objects tend to pose little risk to the audience's wellbeing and, therefore, conceptualizing something as art may lead to greater feelings of safety from real-world consequences (Wagner et al., 2014). I would argue that both increased sense of psychological distance and decreased fear of real-world consequences associated with the art schema might explain why people might appropriate when something is conceptualized as art. Increased psychological distance from an object allows for abstraction which may be conducive to/facilitate appropriation. And decreased fear of risk to one's wellbeing may also allow for appropriation as people are not preoccupied with real-world consequences and can, therefore, introspect in a safe environment (Ribeiro, 2014). Future research may wish to investigate the preconceptions associated with the art schema and how they might encourage appropriation of art.

Degree of art-ness

A question arises about willingness to appropriate in cases where it is not obvious that a work is considered "art". For example, Anne Frank's personal diary was not created with the intent to be read as a work of art. The book, however, is much loved and cherished by readers. The Guardian newspaper has a page dedicated to "10 beautiful quotes from The Diary of a Young Girl" (Tscherry, 2015). The Diary of Anne Frank is an interesting example of a case where the work was not intended to be a work of art but it appears that people appropriate the emotions in it.

One way of understanding this is that people appropriate the emotions in a work to the extent that they perceive it as a work of art. Some people actually perceive *The Diary of Anne Frank* as having an art-like quality. Literary critic, Francine Prose, argues that the “afterlife” of the book has transformed it into a work of art that has inspired the creation of derivative works such as the Broadway Musical, *The Diary of Anne Frank* (McCrum, 2010). While the studies in this chapter manipulated the experimental conditions so works were either framed as art or not-art, it is possible that people’s perception of *art-ness* is graded. In other words, some kinds of works may be perceived as being more art-like than others. Diaries by literary figures such as Sylvia Plath and Emily Dickinson may be considered to be more art-like than your friend’s diary from their teenage years. Articles in *The New Yorker* may be considered more literary and art-like than news articles in *The New York Times*. Because there is no real consensus on the definition of art, there is a degree of individual variability in what people consider to be art versus not-art (Boden, 2007; Scholz, 1994). It is possible that the extent to which a work is perceived as art predicts willingness to appropriate and, therefore, liking of the work.

In fact, it is possible that there was no significant difference in liking between the short story and blog post in studies 2 – 4 because people considered blog posts to have art-like qualities and/or short stories to have not-art-like qualities. In other words, the distinction in art-ness between short stories and blog posts may have been less stark than the difference between e.g., song lyrics and Tweets. In fact, a post hoc inspection of pairwise comparisons of art/not-art on appropriation for each vignette pair indicated that the blog post was appropriated more than the other not-art items and that the short story was appropriated less than the other art items. Thus, it is possible that people did not automatically characterize short stories as art and blog posts as not-art in the way that they did for the other vignette pairs.

One possible way of investigating whether degree of art-ness predicts willingness to appropriate would be to present participants with a list of a variety of different kinds of objects e.g., short story, blog post, song lyrics, movie script, monologue, diary entry, newspaper article, documentary, opera libretto, novel, etc. Participants might then be asked to rate the degree to which they perceive the object as art on a scale. Then, participants could be asked to rate the extent to which they would be willing to appropriate the emotions expressed in the same list of items. A regression or correlational analysis could then be run to see if the extent to which an object is perceived as art relates to the extent to which people are willing to appropriate the emotions expressed in the object.

Appropriation in not-art contexts

Another way of understanding why people might appropriate the emotions in a work that was not intended to be a work of art, like *The Diary of Anne Frank*, is that there may be special not-art contexts in which it is okay to appropriate. Specific properties of a not-art object may lend itself to appropriation.

Construal level theory suggests that there are several factors that may influence perception of sense of psychological distance and it is possible that increased sense of psychological distance from something may increase one's willingness to appropriate (Mocaiber et al., 2011). Time is an example of one factor that influences sense of psychological distance and, thus, reduces the emotional intensity of memories of past events (Gu & Tse, 2016). While there is no empirical evidence for a correlation between time, sense of psychological distance, and willingness to appropriate, it is possible that such a relationship exists. For instance, *The Diary of Anne Frank* was

written in the distant past and this may lend itself to appropriation because the reader feels psychologically distant from Anne Frank and the Holocaust. One may be more willing to appropriate a private letter written to a friend that was written several centuries ago than a letter that was written to a friend yesterday because one feels that enough time has passed; there is a greater sense of psychological distance from the letter that was written centuries ago. Time is just one example of a property that increases sense of psychological distance there are many other factors that may contribute to sense of distance and, therefore, willingness to appropriate. My prediction is that perception of psychological distance may influence willingness to appropriate in not-art contexts.

Additionally, there are certain kinds of not-art contexts where people use the pronoun “you” to refer to people in general and not a specific individual. It has been suggested that the generic use of the word “you” increases a sense of resonance (Orvell, Kross, & Gelman, 2020). While resonance is not the same as appropriation, both involve understanding the content of the communicator and deriving meaning which is personally relevant to the listener. There are certain not-art contexts when people tend to use the generic “you” to create resonance – one obvious example is political speeches. For example, when Obama said, “You should be able to learn and make mistakes and live a life of joy without having to worry about what’s going to happen when you walk to the store, or go for a jog, or are driving down the street, or looking at some bird in a park”, there is a sense in which this speech is very much about George Floyd and other specific cases of people who were targets of racial violence (Gonzales, 2020). There is also a sense, however, in which the “you” is supposed to be about the experience of persecuted people of colour in general and, if one is a member of such a group, one can appropriate the “you” and experience this sentence as an expression of one’s own frustration and anger. An empirical study

has found evidence that increased resonance in political speeches increases engagement in listeners – the researchers found that neural activity was greater when listening to rhetorically powerful speeches compared to rhetorically weaker speeches, where rhetoric power was manipulated as the degree to which the speech resonated with listeners (Schmälzle et al., 2015). There are also other not-art contexts where people may use the generic “you” to invoke resonance. For example, people often use “you” in adages like, “You live, you learn” and “Eventually, you recover from heartbreak” (Orvell, Kross, & Gelman, 2020). Future research may wish to investigate the parameters and situations that determine when people might appropriate in not-art contexts.

Non-representational Art

The present studies used text-based stimuli and demonstrated the effect of appropriation on liking. Text-based stimuli were chosen so participants would be able to easily answer questions about the emotions and events described in the text and whether people appropriated the emotions described. There is no reason to believe, however, that people only appropriate when engaging with text-based art. Philosopher Jerrold Levinson actually builds his argument about appropriation by using examples from non-representational artforms – specifically, classical music (Levinson, 2005). Levinson gives the example of listening to the *Poco Allegretto* of Brahms’ 3rd Symphony and how the listener first identifies the sadness in the music and then experiences that sadness as though it is an expression of their own sadness. The same argument might apply to other non-representational artforms – the only pre-requisite is that the audience must be able to identify the emotion expressed in the art. Once the emotion has been identified, it is possible to appropriate it. Future research may wish to test the concept of appropriation with non-representational artforms such as music or abstract visual art.

Empathy

Appropriation and empathy are different concepts but they are related. Appropriating the emotions in art requires empathy but empathy can be common to both art and not-art contexts. There are two main scientific constructs of empathy: cognitive empathy and affective empathy. Cognitive empathy is the ability to understand the mental states of another (Baron-Cohen & Wheelwright, 2004; Harris, Johnson, Hutton, Andrews, & Cooke, 1989; Preston & de Waal, 2002). In both art and not-art contexts, the observer must first understand the mental state of the artist which is expressed through their work of art. In the not-art conditions in studies 1-5, people clearly understood the mental states of the authors of the texts because they disliked the sad texts, which implies that they understood what the authors were feeling. In the art conditions, people had to understand the mental states of the author in order to answer the questions about appropriation.

The other type of empathy is affective empathy, the ability to feel what someone else feels (Gallese, 2003). It should be noted that the account described in these studies indicates that people like sad art but does not address whether people actually felt negative emotion in response to sad art.

The literature on the psychology of art draws a difference between perceived emotions, the intellectual processing of emotions when we engage with art, and induced emotions, the psychophysiological changes that occur when engaging with art, (Juslin & Västfjäll, 2008; Song et al., 2016). Research suggests that perceiving emotion is not necessary for inducing emotion- it is possible to identify an emotion in art without necessarily feeling it oneself (Kallinen & Ravaja, 2006; Merrill, Omigie, & Wald-Fuhrmann, 2020; Schubert, 2013). Furthermore, there is also debate on what kinds of emotions art can induce in the audience. Some philosophers and psychologists argue that there are “aesthetic emotions”, which are unique and different from

everyday emotions (Kivy, 1980; Miu et al., 2016; Scherer & Marcel, 2008). Supporters of this view suggest that these emotions are different from everyday emotions because they are utilitarian rather than proactive, they relate to aesthetic evaluation or appreciation, and they are associated with subjective feelings of pleasure or displeasure (Wagner et al., 2019). Other scholars believe that art arouses everyday emotions that are similar to what we experience in everyday life, like sadness and happiness (Carroll, 1997; Juslin, 2011). Finally, there is a third group that suggests that these two views may not actually be incompatible (Juslin, 2013).

Note that the studies conducted in this chapter only engage with perceived emotion and not induced emotion. Participants were asked to read a sad text and it is clear that participants perceived emotion in the text as there was only a difference in liking between art and not-art when the valence of the text was sad. The studies did not, however, address whether the texts actually induced negative emotion in participants. It is quite possible that participants felt sad in response to these sad texts as there is substantial empirical evidence demonstrating that sad art does, indeed, make people feel sad (Garrido & Schubert, 2015; Huron, 2015; Schubert, 2013). In fact, sad music is so powerful at inducing negative affect in the listener that it is often used in mood induction psychology studies (e.g., Baltes, Miclea, & Miu, 2011; Garrido & Schubert, 2015; Huron, 2015; Lundqvist et al., 2009).

The claim I am making does not contradict this body of research. It is entirely possible that sad art makes us actually feel sad but, despite feeling sad, we still enjoy it. If we were to find that these sad texts actually make people feel sad, this finding would be perfectly consistent with research suggesting that aesthetic appreciation is dissociable from induced emotion (Leder, Greger, Briebe, & Schwarz, 2012; Paasschen, Bacci, & Melcher, 2015; Vuoskoski et al., 2012). Thus,

while empathy may be relevant to both art and not-art contexts, appropriation can explain the difference in liking between the two contexts.

Other mediators

The mediation analysis in the results of Study 4 indicated that appropriation partially mediates the relationship between art/not-art and liking. Because appropriation does not fully mediate the relationship, there might be other explanations for the effect of art on liking of sad content. One potential mediator is interpersonal concern (Batson, 1987). This is the kind of concern you exhibit when someone shares how upset they are in everyday social interactions. When someone conveys how upset they are to you, you coordinate a series of psychological processes in response to the person's distress (Batson, 1987; Tomasello, 2020). For example, you might feel empathically sad yourself, express distress at the person's sadness, and try to engage in behaviours to make them feel better, such as hugging (Hastings, Zahn-Waxler, & McShane, 2006; Zahn-Waxler et al., 1992). A part of coordinating this response, however, is to feel concerned and negative yourself as a response to the other person expressing their sadness (Zahn-Waxler et al., 1992).

When engaging with art, however, you are not obliged to feel interpersonal concern for the artist and do not need to coordinate the same psychological processes involved in feeling concerned for someone else. When listening to Mozart's *Requiem*, for instance, you are not supposed to feel sorry or concerned for Mozart's wellbeing and coordinate the appropriate psychological responses to express empathic concern and make him feel better. However, when someone tells you that they are feeling severely depressed, you are obligated to feel concerned and experience the psychological processes involved in coordinating an appropriate response. Thus, interpersonal

concern for others may be another key difference that distinguishes art from not-art and it may also be a potential explanation for what allows us to enjoy the expression of sadness in art.

Another potential mediator, which was briefly discussed in Chapter 1 of this thesis, is transportation (Green, Brock, & Kaufman, 2004). When engaging in narrative worlds, we often report feeling transported or absorbed in the narrative world and this has been shown to increase enjoyment of negative emotions in art (Ahn, Jin, & Ritterfeld, 2012; Hirsch et al., 2014; Murphy et al., 2013; Oliver & Bartsch, 2011). One might think of transportation/absorption as the opposite of appropriation in some ways. Transportation is about how you, the audience, become a part of the art and get absorbed by the (Busselle & Bilandzic, 2008; Green, Brock, & Kaufman, 2004; Green, Chatham, & Sestir, 2012). Appropriation, on the other hand, is about you take the emotions expressed in the art make them *your own*. While transport is about imagining yourself in the narrative world, appropriation is about experiencing the emotions expressed in the narrative world as though they are coming from within you. On the surface, it may seem that these two processes are at odds but it is entirely possible that they can both occur and explain liking for sad art. As initial evidence for this hypothesis, one study showed that people can feel a sense of identification of self with the other (which is similar to, albeit not exactly, appropriation) but not necessarily feel transported and vice versa i.e., they are distinct processes (Tal-Or & Cohen, 2010). It is also possible that there are certain circumstances when people are more likely to feel transported and when people are more likely to appropriate. Future research may wish to understand and tease apart the differences between appropriation and transportation as predictors of liking of sad art.

Appropriation and Fictionality

Finally, it is worth noting that while fictionality does not explain why we like sad art, the results of Study 3 indicated something really surprising. Namely, we seem to like negative emotions in art *more* when we believe that the emotions expressed are real and that the events described actually happened. So, for example, when people read the monologue, they liked the monologue more when they believed that the emotions and events described in it were based on reality and not fiction. This finding may actually be all the more exciting given the results of Study 4. It is possible that people are more inclined to appropriate or derive more pleasure from appropriating when they believe that the emotions expressed in a work of art are real as opposed to fictional. Future studies could investigate if the extent to which a work of art is based on real emotions influences the degree to which people are willing to appropriate the emotions expressed in the work.

Intuitively, it makes sense that people might be more willing to appropriate the emotions expressed in a work of art when they know that the artist actually felt those emotions. Consider reading Sylvia Plath's *The Bell Jar* and then finding out that Sylvia Plath was never depressed and was actually a very happy person. You might feel cheated and actually dislike the book if you found out that it was not even loosely based on any emotions that she actually felt or events that actually happened in her life.

If it turns out that people are more willing to appropriate the emotions in art if those emotions are based on reality, this phenomenon could be explained by the literature on authenticity judgements in art, specifically the concept of expressive authenticity. Expressive authenticity requires that the art object must be an expression of the true values and beliefs of the creator as opposed to someone else's values and beliefs (Dutton, 2004; Kivy, 1995). There is some empirical

evidence suggesting that people think about the true values and beliefs of the artist when making judgements about their art and that people automatically engage in the psychological process of “truth-seeking” when evaluating cultural products (Kreuzbauer & Keller, 2017; Newman, 2019). Truth-seeking in art implies that people must believe that at least some part of the art is based on something real in the artist’s life, be it a real emotion that the artist felt or a real event that happened in their life (Kreuzbauer & Keller, 2017). Appropriating these real emotions expressed in art may therefore lead to a sense of catharsis because you feel like someone else is expressing these very authentic and real feelings that you wish you could express yourself (Ribeiro, 2014).

It may actually be undesirable and dislikeable to appropriate fictional or fake emotions in art. Consider reading *The Bell Jar* written by a very happy Sylvia Plath. There might be something very disconcerting about appropriating the emotions in a work that is based entirely on fictional emotions or things that never happened. In fact, you may be less inclined to appropriate because there is something disingenuous about the experience of appropriating fake emotions. Thus, the degree of enjoyment derived from appropriating may be related to the extent we perceive a work of art to express the emotions or experiences that actually happened in real life.

Conclusion

The present work builds on the empirical evidence for the art framing effect and investigates two possible accounts for why people like sad art. The results find evidence against the previously hypothesized notion that the enjoyment of sad art is explained by the perceived fictionality of art. Furthermore, I present the first empirical evidence for the concept of appropriation. Building on previous philosophical arguments on the topic, I predicted that simply conceptualising something as art allows you to appropriate the emotions in the work. I found that appropriation predicts

liking of negative emotions and that the extent to which people conceptualise a work as art predicts their willingness to appropriate.

This work ties in with the greater aims of the thesis as we can think of appropriation as another form of connection. The audience begins by understanding the mental states of the creator but, in order to enjoy the sadness expressed in the work, the audience must experience it as an expression of their own pain rather than the expression of someone else's pain. The enjoyment is, therefore, derived not by thinking of someone else's sadness but is instead derived from the catharsis associated with exploring your own sadness. As discussed earlier in the general discussion section of this chapter, appropriation may not be a process exclusive to art, but it is a process integral to our experience of art in a way that it is not integral to most communication in everyday life. If someone expressed how lonely and depressed they are in a conversation, it would be very wrong to appropriate those emotions and think of that person's words as an expression of your own loneliness and depression. When those exact same words are expressed in a poem or song, however, you are automatically given licence to appropriate.

In fact, it is possible that appropriation may be an integral property of art - simply *being* art gives you implicit licence to appropriate the emotions expressed. Thus, the larger implication is that simply calling something art allows you to engage with the emotions expressed in a very different way than you would in everyday interactions. This work sheds light on another way in which art is a means of connection.

CHAPTER 5: GENERAL DISCUSSION

Summary of Research Findings

In this thesis, I have reported on two sets of empirical projects exploring implications of art as a means of communication and mechanisms that underlie connection between audiences and artists. I will begin by recapping and discussing the broader implications of my findings for both of these sets of experiments before discussing the contributions of this thesis in the next section.

Chapters 2 and 3 began by looking at immersive technologies as a potential means for augmenting communication between the audience and the artist. This research explored an application of these technologies that has not been explored to date – how haptics and headphones can augment the experience of listening to music. Specifically, I conducted novel research on how two immersive technologies (haptic wearable devices and headphones) can enhance the sense of psychological connection towards the artist when used in the music listening context. Chapter 2 explored a study showing that an technology that creates immersion via the auditory modality can increase feelings of empathy, parasocial bond, and loyalty towards the artist. This study showed that headphones increase these measures of psychological connection to the artist because they generate a feeling of social presence, or the feeling that the artist is “there” with the listener. Additionally, results indicated that headphones decreased feelings of loneliness because they generated a sense of social presence. In fact, one might even interpret the results on loneliness as further evidence of psychological connection as previous studies have used both positive measures (like parasocial relationship) and negative measures (like loneliness) to measure connection to others (Kim, Kim, & Yang, 2019). Chapter 3 explored whether an immersive technology that influenced another sensory modality, the tactile modality, could similarly influence the music listening experience.

This study found that haptic feedback increased feelings of empathy, parasocial bond, and loyalty towards the artist. Like with the headphones study, social presence mediated the relationship between haptics condition and the measures of psychological connection to the artist. Like with the headphones study, haptic feedback was also associated with decreased feelings of loneliness in the listener because haptics generated a sense of social presence. Thus, the results on loneliness may be considered a complimentary finding which provides additional evidence that haptics increase sense of psychological connection to the artist.

Neither of these technologies have been as extensively studied as virtual reality and augmented reality (e.g., Carey et al., 2017; Cummings et al., 2021; Gerdes, Segal, & Lietz, 2010; Soliman, Peetz, & Davydenko, 2017). In fact, the research on headphones is scant despite the ubiquity of these devices. These studies on virtual and augmented reality have highlighted the use of technology to increase our sense of connection to mediated others. Both the headphones and haptics studies found similar results even though neither of these technologies are as immersive as e.g., virtual reality headsets. Many virtual reality studies create a sense of immersion through a variety of ways like headsets and headphones for environmental isolation, realistic visual scenes for immersion in the virtual landscape, and life-like avatars (e.g., Carey et al., 2017). Neither headphones nor haptics possess the affordances of a more informationally rich technology like virtual reality (Steffen et al., 2019). In the headphones study, participants only received auditory isolation. In the haptics study, participants received both tactile stimulation and auditory isolation because they were wearing headphones. Despite being relatively informationally impoverished technologies, both of these technologies generated a sense of social presence and enhanced sense of connection to mediated individuals. This is striking because it suggests that the effect of immersive technology

on perception of social presence and attitudes towards mediated individuals is robust enough that it can be detected even in simple, low-cost, and informationally poorer technologies.

Additionally, while headphones and haptics influence two different sensory modalities, these two preliminary studies indicate that a similar mechanism may underlie how both of them increase our sense of connection to artists. Mediation analyses determined that the same mechanism may underlie how both of these technologies enhance the sense of psychological connection to the artist. Results indicate that both technologies generate a sense of social presence for the listener and this mediates all of the other measures of psychological connection to the artist. The results of my studies are in line with theories suggesting that, while affordances differ between technologies, a similar mechanism may explain how they operate (Ijsselstein & Riva, 2003). Specifically, these results contribute evidence to the idea that immersive technologies, in general, can increase connection to mediated others and decrease feelings of loneliness because they generate a feeling of social presence (Grant, 2016; Janssen et al., 2010; Jin, 2010; Lee, 2013; Schultze & Brooks, 2016; Shin, Song, Kim, & Biocca, 2019). The results of these studies speak to the potential application of immersive technologies in music experiences as a means of fostering a sense of connection between audiences and artists and also gives us insight into a potential mechanism for augmenting communication between artists and audiences.

On a practical level, both of these technologies are accessible in that they are inexpensive and easily portable, unlike virtual reality headsets which are cumbersome and much more expensive. These results are promising and suggest that there are cost-effective and simple ways we can augment our engagement with recorded audio content in our own homes. While these studies

specifically used music as stimuli, one can imagine using headphones and haptics to augment experience of other kinds of audio-based art forms like audiobooks, podcasts, and film.

Chapter 4 explored how the differences in the processes that underlie engagement with art versus everyday interactions may explain the paradox of negative emotions in art. While many previous accounts for why people like sad art have focused on the features intrinsic to art that make the expression of sadness enjoyable, my account suggests that there is something about just *being* art that allows one to enjoy the negative emotions expressed. In a series of studies, I found that people prefer the exact same text when they are told that they are reading a work of art versus not-art but this effect is only observed when the content of the text is sad. These results build on the results found by Greger, Leder, & Kremer (2014), Van Dongen et al., (2016) and Wagner et al., (2014) by providing empirical evidence for the art-framing effect. While previous studies found evidence for the art-framing effect with visual stimuli, I extended these results by finding the first evidence for the art-framing effect in text-based stimuli. This is important because it speaks to the generalizability of the effect of conceiving something as art on people's judgements about an object, regardless of medium (e.g., text, photograph, etc.). Additionally, previous studies only used a single pairing of art versus not-art, such as film stills versus documentary stills in Van Dongen et al., (2016). Studies 2-5 showed that the effect of art can actually generalise across a variety of different art forms as I used four vignette pairs and treated them as a random factor in the linear regression model.

I then explored two competing hypotheses for why people like sad art more than sad not-art. Previous research has suggested that art implies fictionality and that may be why people prefer the expression of sadness in art – because they believe sadness expressed in art is less real than sadness

in everyday life (Goldstein, 2009; Mocaiber et al., 2011; Pouliot & Cowen, 2007). The results of Study 3 show that although people perceive art to be based on fictionality more than not-art, people *still* prefer sad art. In other words, perceived fictionality of the work really does not explain why we enjoy sad art.

I then tested an alternative hypothesis drawn from the philosophy literature on the concept of appropriation. My results showed that people enjoy the expression of negative emotions to the extent that they can appropriate them and that people appropriate negative emotions to the extent that they perceive those emotions as being expressed in a work of art. This research presents the first empirical exploration of the concept of appropriation. It also extends the philosophical discussion on appropriation by suggesting that conceptualising something as a work of art gives people licence to appropriate and actually explains liking for sad art. Thus, my results provide empirical evidence for one possible explanation for the paradox of negative emotion in art, a philosophical problem that has its roots in antiquity (Aristotle, trans. 1997; Augustine trans. 1960; Hume 1758/1987).

Limitations

While this research is novel and provides valuable theoretical insight into the mechanisms by which we connect with artists, there are also several limitations to the studies discussed in this thesis. This section will outline some of the larger issues that underlie my research.

Art Stimuli

Art is a broad category that, as discussed in the introduction, is hard to define. In this thesis, I attempted to address the generalizability of my findings by investigating a variety of different art forms and different kinds of art stimuli such as auditory and linguistic stimuli. I consciously chose to use a variety of different written art forms, as song lyrics, short stories, monologues from plays, and movie scripts, to address the generalizability of my findings in the project on sad art. That said, I acknowledge that there are a myriad other art forms that exist that my studies did not address due to limitations inherent to the study designs. For example, in the studies on haptics and headphones, I was limited to stimuli that had an auditory component. Similarly, I had to use stimuli that would be identical between the art/not-art conditions. Previous studies using art framing paradigms had used photographs framed as either movie stills or photographs of real events so I chose to use another type of stimuli to test the generalizability of the effect (Greger, Leder, & Kremer, 2014; Mocaiber et al., 2010; Mocaiber et al., 2011; Wagner et al., 2014). I concede, however, that there are other types of stimuli that would be worth investigating if one can find a way to present identical stimuli in both the art/not-art conditions to ensure that the effect found is, indeed, a framing effect and not due to substantive differences in the stimuli between the conditions.

Alternative Mechanistic Explanations

In the present studies, I isolated and empirically tested mediating mechanisms that I believed were the most relevant to and explanatory of the observed effect. For example, in the haptics and headphones study, I identified social presence as a potential mediator based on the literature on immersive technology (Baecker et al., 2014; Basdogan et al., 2000; Chang & Sullivan, 2005; Sallnäs, Rasmus-Gröhn, & Sjöström, 2000). While social presence completely mediated the observed

main effects, there are other potential mediating mechanisms and unmeasured confounds that were not explored e.g., stimulus intensity. Similarly, in the studies on sad art, I investigated as perceived fictionality and appropriation as potential explanations for the main effect of art on liking. While perceived fictionality did not explain the main effect, appropriation largely mediated the effect of art on liking. That said, it did not fully mediate the effect and there are other possible mediating factors e.g., obligation to feel concern for the subject which may be greater for not-art than art.

Demand effects

It is also possible that there were demand effects in the experimental design for the studies detailed in Chapters 3 and 4. In Chapter 3, participants were either in the haptics or control condition. Participants in the haptics condition received haptic feedback when they listened to the music and, while no one guessed the exact purpose of the study, it is possible that participants may have guessed that the study had something to do with the vibrotactile feedback they were receiving. It is, thus, possible that people in the haptics condition answered on the extremes of the scale because they believed that is what the experimenters wanted them to do. The planned follow-up study with the two haptics conditions (synchronous and asynchronous) would have eliminated demand effects. That said, participants in the present study were given a suspicion probe and, while many people believed the study had something to do with the haptic device, no one guessed the exact purpose of the study and it is thus unlikely that they would have been able to predict the direction of the hypothesized effect.

Similarly, participants in Studies 2-5 in Chapter 4 were told that they were reading specific kinds of art texts: song lyrics, monologue, short story, and movie transcript. It is possible that

participants may have tried to overthink the answers if they thought that they were being asked about their intuitions about specific types of texts e.g., their attitudes towards monologues, specifically. This is not likely, however, as the results indicate that there was an overall main effect of art/not-art on liking in all five studies. Additionally, it is possible that there were demand effects because the art conditions had exciting stimuli like song lyrics and short stories while the control/not-art stimuli were more mundane like Tweets, diary entries. However, it is also unlikely that any demand effects would have been a major source of bias as the examples in the not-art stimuli were chosen so they would be realistic and meaningful. Finally, because the study was a between-subjects design, it is highly unlikely that participants would have guessed the purpose of the study and responded based on the presumed purpose of the study.

There are also other limitations which, while inherent to my studies, are also major limitations that influence psychology research as a whole.

WEIRD Participant Samples and Stimuli

Both studies use Western participants responding to Western art stimuli and this presents a key limitation to the findings. In the headphones and haptics studies, participants were recruited from the city of Oxford and the studies on sad art filtered for participants based in the United States. The role and purpose of art differs in Western society as opposed to in many other cultures. In Western cultures, there is a defined artist and audience. The audience observes the artist but does not necessarily participate (Cross, 2012, p. 316; Markusen & Brown, 2014). This style of engagement with art, while quite typical for Western cultures, is less representative of most cultures around the world and throughout human history (Markusen & Brown, 2014). Art, in many cultures, is participatory and the distinction between audience and artist is less clear.

The design of both projects described in this thesis required that participants listen to music or read excerpts of works of Western art in formats/contexts traditional to consumption of Western artforms. In response to engaging with the art, participants were then asked to evaluate the art and/or make judgements about the artist. While these results are illuminating about how Western audiences think about or make judgements about art, the results are less informative about the processes that underlie how people from other cultures think about art. It is not evident that people from cultures with traditions of collective art-making would necessarily have the same intuitions about artists and artist loyalty that Western audiences do.

While there is not an abundance of cross-cultural research that is relevant to the research questions investigated in this thesis, there are a few relevant research papers which have implications for my research on the paradox of sad art presented in Chapter 4. Cross-cultural research finds that vocalizations expressing negative emotions tend to be recognized across cultures while the ability to recognize positive vocalizations tends to be more culturally variable (Sauter et al. 2010). Additionally, research also suggests that sculptures from different cultures across human history have similar displays of negative facial expressions like pain, strain, anger, and sadness (Cowen & Keltner, 2021). One interpretation of these findings is that there is something important about experiencing negative emotions from an evolutionary perspective. Perhaps, negative emotion played an important role in recognizing stressors in human evolutionary history and, while the stressors have changed over time, our displays of these emotions have remained the same. One might then argue that experiencing negative emotions via art is evolutionarily important – it might be a way for us to practice experiencing distress in a safe environment.

Online studies conducted on Mechanical Turk

While this limitation applies only to the studies discussed in Chapters 2 – 4, it is worth mentioning the limitation of using Amazon’s Mechanical Turk (MTurk) for online data collection. MTurk allows people to complete online tasks, such as surveys, in return for financial compensation. The studies which I posted to MTurk took a maximum of five minutes and participants were compensated for their participation. Concerns have been raised, however, about the quality of MTurk data and about their comparability to the quality of data obtained in traditional university lab samples. Participants on the platform are often poorly paid and, as a result, MTurk participants can be inattentive, dishonest, and have a high attrition rate (Wessling, Huber & Netzer, 2017; Zhou & Fishbach, 2016). In my studies, there was less risk of participants misrepresenting themselves and affecting the data although they might have been dishonest about their demographic information. There was, however, a risk of inattention so participants were given a very simple attention check as well as a comprehension check. If a participant failed to pass either the attention check or comprehension check, they were excluded from the data set. Unfortunately, over 25% of participants had to be excluded in Studies 2, 3, and 4 for failing one or both of these checks. While concerns about MTurk data quality have been voiced over the years, the quality of MTurk data has become significantly worse due to the COVID-19 pandemic as a large number of people joined the platform in search of online work, resulting in rapid shifts in user demographics on the platform (Arechar & Rand, 2020). A report published by Arechar and Rand (2020) found that participants who joined during the pandemic were more likely to be less reflective and less attentive than previous MTurkers. To address the growing concern with using MTurk for data collection, I conducted Study 5 (the last study conducted) on Prolific Academic, a crowdsourcing behavioural platform which tends to have more attentive participants and yield higher quality data (Peer et al., 2017). This greatly increased the quality (and quantity) of the data as only 5% of

participants had to be excluded in this study. Future investigations in this field may wish to use Prolific Academic for online data collection moving forward.

Implications

There are several implications of this research. First, it is necessary to take an interdisciplinary approach to research on art as a means of communication and connection because art is such a multifaceted construct. These research questions investigated in this thesis necessitated the use of concepts and techniques drawn from fields outside the realm of psychology. Chapters 2 and 3 drew upon research in media studies, multisensory research, and media psychology. The advent of recording is a recent phenomenon in human history and, thus, I chose to explore engagement with music via technology. Chapter 4 of this thesis drew upon the philosophy of art literature. I investigated whether people's everyday intuitions about sad art are in line with previous philosophy work on the subject. Part of the novelty of my findings can be attributed to the inspiration from research in these other disciplines and the interdisciplinary nature of this research speaks to the importance of using a variety of different methodologies and approaches to studying art.

Additionally, this research highlights the importance and value of art in our lives. The haptics and headphones projects in Chapters 2 and 3 were motivated, in part, by the sheer amount of time people spend engaging with recorded art forms such as music, television, and film. We dedicate approximately twenty-seven hours per week to music and stream approximately two hours of television and film per day (Clarke, 2019; Statistica, 2019). We enjoy consuming this art even though it is mediated by technology and pre-recorded (i.e., there is no interaction). Despite the mediated way in which we consume music, we still seem to form a sense of connection to artists

and my research shows that this sense of connection can be augmented with the use of immersive technologies.

Chapter 4 of this thesis also speaks to the importance of art in our lives as we actively seek negative emotion in art to serve a purpose that cannot be filled by experiencing those same negative emotions in real life. Appropriation is said to increase liking of negative emotions in art because it can give rise to feelings of catharsis, help us explore and gain mastery over our emotions, and experience extreme emotions we might value but never want to experience in real life (Levinson, 1982; Ribeiro, 2014; Strohl, 2019). Hence, it is likely that appropriation gives rise to liking of sad art because appropriating sad art is personally rewarding in a number of ways. The results of my studies also reveal that people particularly like the expression of real sad emotions over fictional sad emotions. This indicates that we particularly seek and enjoy sadness in art that is an expression of genuine negative emotions and that there is something valuable about appropriating someone's real pain or sadness. Thus, the research in this chapter suggests that sad art fulfils a very important role in developing our inner emotional lives.

Finally, this research provides support for the suggestion that art may be used as an intervention to combat loneliness. The incidence of self-reported loneliness has been steadily climbing and we are living in what has been described as a “loneliness epidemic” (King, 2018). COVID-19 has reportedly exacerbated the issue of loneliness in many countries around the world (Li & Wang, 2020; Padmanabhanunni & Pretorius, 2021; Stickley, Matsubayashi, & Ueda, 2021). While research has previously shown that creating art can have therapeutic effects that may decrease feelings of loneliness, the findings in this thesis are more in line with recent research suggesting that merely consuming art e.g., as a listener, reader, etc. may be a means of feeling connected to others and

decrease feelings of loneliness (Clift et al., 2010; Corvo & de Caro, 2020; Hong, Hibbard, & Hibbard, 2018; Overgaard & Sorensen, 2015; Schafer, Saarikallio, & Eerola, 2020). This research provides insight into how technology can be used to augment the sense of connection to others (the artist in this case) and decrease feelings of loneliness. Additionally, while the sad art studies did not empirically demonstrate that appropriation makes people feel less lonely, the philosophy literature has stipulated that one potential benefit of appropriating negative emotions in art is to validate one's own negative feelings and make people feel "heard" and less alone in the world (Ribeiro, 2014; Levinson, 2013). I began the research described in this thesis a year before the COVID-19 pandemic and could not have imagined just how relevant this project would have been to current recorded art consumption behaviours and the growing desire to feel connected to others.

Conclusion

Taken together, this research provides evidence that art is not merely an object to be enjoyed hedonically. Art is also a powerful means of communication that can convey complex ideas and emotions and connect audiences to artists. This research discusses some of the ways in which people can connect with and communicate via art. Using approaches from different disciplines, this thesis shows how we can augment our sense of connection to artists via immersive technologies. Crucially, these studies indicate that simple, low-cost technologies may enhance our engagement with recorded music and also reduce feelings of loneliness. This thesis also discusses how art can be used to understand and explore our own emotions. It provides evidence that appropriation allows us to enjoy negative emotions in a way that may enrich our internal emotional lives, but only when those negative emotions are expressed in art. Thus, this research suggests that

engaging with sad art, specifically, may be a valuable emotional exercise and a means for understanding ourselves.

Ultimately, I hope that this research will be of interest to psychologists concerned with gaining deeper insights into the mechanisms that underlie art as a means of communication between artist and audience, artists and art business professionals wishing to strengthen their connection with audiences, entertainment technology companies, and people who love art and wish to understand why we enjoy art experiences and how to augment those experiences for personal enjoyment.

REFERENCES

- Agres, K., Herremans, D., Bigo, L., & Conklin, D. (2017). Harmonic structure predicts the enjoyment of uplifting trance music. *Frontiers in Psychology*, 7(1), 1999.
<https://doi.org/10.3389/fpsyg.2016.01999>
- Ahn, D., Jin, S.-A. A., & Ritterfeld, U. (2012). “Sad movies don’t always make me cry”: The cognitive and affective processes underpinning enjoyment of tragedy. *Journal of Media Psychology: Theories, Methods, and Applications*, 24(1), 9–18. <https://doi.org/10.1027/1864-1105/a000058>
- Alter, A. L., & Oppenheimer, D. M. (2008). Easy on the mind, easy on the wallet: The roles of familiarity and processing fluency in valuation judgments. *Psychonomic Bulletin & Review*, 15(5), 985–990. <https://doi.org/10.3758/PBR.15.5.985>
- Anderson, R. T., Camacho, F. T., & Balkrishnan, R. (2007). Willing to wait? The influence of patient wait time on satisfaction with primary care. *BMC Health Services Research*, 7(1), 31.
<https://doi.org/10.1186/1472-6963-7-31>
- Andrade, E. B., & Cohen, J. B. (2007). On the consumption of negative feelings. *Journal of Consumer Research*, 34(3), 283–300. <https://doi.org/10.1086/519498>
- Andrews, M., Luo, X., Fang, Z., & Ghose, A. (2016). Mobile ad effectiveness: Hyper-contextual targeting with crowdedness. *Marketing Science*, 35(2), 218–233.
<https://doi.org/10.1287/mksc.2015.0905>
- Anglada-Tort, M., & Müllensiefen, D. (2017). The repeated recording illusion. *Music Perception*, 35(1), 94–117. <https://doi.org/10.1525/mp.2017.35.1.94>
- Appel, L., Appel, E., Bogler, O., Wiseman, M., Cohen, L., Ein, N., Abrams, H. B., & Campos, J. L. (2020). Older adults with cognitive and/or physical impairments can benefit from immersive

- virtual reality experiences: A feasibility study. *Frontiers in Medicine*, 6: 329.
<https://doi.org/10.3389/fmed.2019.00329>
- Appel, M., & Malečkar, B. (2012). The influence of paratext on narrative persuasion: Fact, fiction, or fake? *Human Communication Research*, 38(4), 459–484. <https://doi.org/10.1111/j.1468-2958.2012.01432.x>
- Arechar, A. A., & Rand, D. (2020). *Turking in the time of COVID*. PsyArXiv.
<https://doi.org/10.31234/osf.io/vktqu>
- Aristotle. (1997). *Poetics* (M. Heath, Trans.; New Ed edition). Penguin Classics.
- Augustine, S. (1960). *The Confessions of Saint Augustine* (J. K. Ryan, Trans.; Third Impression in Fontana). Harper Collins.
- Aune, K. S., Aune, R. K., & Buller, D. B. (1994). The experience, expression, and perceived appropriateness of emotions across levels of relationship development. *The Journal of Social Psychology*, 134(2), 141–150. <https://doi.org/10.1080/00224545.1994.9711377>
- Baecker, R., Sellen, K., Crosskey, S., Boscart, V., & Barbosa Neves, B. (2014). Technology to reduce social isolation and loneliness. *Proceedings of the 16th International ACM SIGACCESS Conference on Computers & Accessibility*, 27–34. <https://doi.org/10.1145/2661334.2661375>
- Bailenson, J. N., & Yee, N. (2008). Virtual interpersonal touch: Haptic interaction and copresence in collaborative virtual environments. *Multimedia Tools and Applications*, 37(1), 5–14.
<https://doi.org/10.1007/s11042-007-0171-2>
- Balkwill, L.-L., & Thompson, W. F. (1999). A cross-cultural investigation of the perception of emotion in music: Psychophysical and cultural cues. *Music Perception: An Interdisciplinary Journal*, 17(1), 43–64. <https://doi.org/10.2307/40285811>

- Balkwill, L.-L., Thompson, W. F., & Matsunaga, R. (2004). Recognition of emotion in Japanese, Western, and Hindustani music by Japanese listeners. *Japanese Psychological Research*, 46(4), 337–349. <https://doi.org/10.1111/j.1468-5584.2004.00265.x>
- Ball, L. J., Threadgold, E., Marsh, J. E., & Christensen, B. T. (2018). The effects of stimulus complexity and conceptual fluency on aesthetic judgments of abstract art: Evidence for a default–interventionist account. *Metaphor and Symbol*, 33(3), 235–252. <https://doi.org/10.1080/10926488.2018.1481255>
- Bannan, N., & Dunbar, R. (Eds.). (2012). On the evolutionary function of song and dance. In *Music, Language, and Human Evolution* (pp. 201–214). OUP Oxford.
- Bannerman, H. (2014). Is dance a language? Movement, meaning and communication. *Dance Research*, 32(1), 65–80. <https://doi.org/10.3366/drs.2014.0087>
- Banse, R., & Scherer, K. R. (1996). Acoustic profiles in vocal emotion expression. *Journal of Personality and Social Psychology*, 70(3), 614–636. <https://doi.org/10.1037/0022-3514.70.3.614>
- Bantinaki, K. (2012). The paradox of horror: Fear as a positive emotion. *The Journal of Aesthetics and Art Criticism*, 70(4), 383–392. <https://doi.org/10.1111/j.1540-6245.2012.01530.x>
- Barbot, B., & Kaufman, J. C. (2020). What makes immersive virtual reality the ultimate empathy machine? Discerning the underlying mechanisms of change. *Computers in Human Behavior*, 111: 106431. <https://doi.org/10.1016/j.chb.2020.106431>
- Bar-Hillel, M., Maharshak, A., Moshinsky, A., & Nofech, R. (2012). A rose by any other name: A social-cognitive perspective on poets and poetry. *Judgment and Decision Making*, 7(2), 149–164. <https://doi.org/10.1080/14780887.2018.1442762>
- Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, 34(2), 163–175. <https://doi.org/10.1023/b:jadd.0000022607.19833.00>

- Bartsch, A., & Hartmann, T. (2017). The role of cognitive and affective challenge in entertainment experience. *Communication Research*, 44(1), 29–53. <https://doi.org/10.1177/0093650214565921>
- Barwell, I. (1986). How does art express emotion? *The Journal of Aesthetics and Art Criticism*, 45(2), 175–181. <https://doi.org/10.2307/430558>
- Basdogan, C., Ho, C., Srinivasan, M., & Slater, M. (2000). An experimental study on the role of touch in shared virtual environments. *Transactions on Computer-Human Interaction*, 7(4), 443–460. <https://doi.org/10.1145/365058.365082>
- Batat, W., & Wohlfeil, M. (2009). Getting lost “Into the Wild”: Understanding consumers’ movie enjoyment through a narrative transportation approach. *Advances in Consumer Research*, 36(1), 372–377.
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1–48. <https://doi.org/10.18637/jss.v067.i01>
- Batson, C. D., Fultz, J., & Schoenrade, P. A. (1987). Distress and empathy: Two qualitatively distinct vicarious emotions with different motivational consequences. *Journal of Personality*, 55(1), 19–39. <https://doi.org/10.1111/j.1467-6494.1987.tb00426.x>
- Baumgartner, T., Esslen, M., & Jäncke, L. (2006). From emotion perception to emotion experience: Emotions evoked by pictures and classical music. *International Journal of Psychophysiology*, 60(1), 34–43. <https://doi.org/10.1016/j.ijpsycho.2005.04.007>
- Belk, R. W. (1988). Possessions and the extended self. *Journal of Consumer Research*, 15(2), 139–168. <https://doi.org/10.1086/209154>
- Belke, B., Leder, H., & Augustin, M. (2006). Mastering style – Effects of explicit style-related information, art knowledge and affective state on appreciation of abstract paintings. *Psychology Science*, 48(2), 115–134.

- Berdahl, E., Pfalz, A., Blandino, M., & Beck, S. (2018). Force-Feedback Instruments for the Laptop Orchestra of Louisiana. In S. Papetti & C. Saitis (Eds.), *Musical Haptics* (pp. 171–192). Springer International Publishing.
- Bertram, P. (2015, March 6). What It's All About. Maybe. *Bertram's Blog*.
<https://bertramsblog.com/tag/unmatched-socks/>
- Biocca, F. (1997). The Cyborg's dilemma: Progressive embodiment in virtual environments. *Journal of Computer-Mediated Communication*, 3(2), 324. <https://doi.org/10.1111/j.1083-6101.1997.tb00070.x>
- Blanke, O. (2012). Multisensory brain mechanisms of bodily self-consciousness. *Nature Reviews Neuroscience*, 13(8), 556–571. <https://doi.org/10.1038/nrn3292>
- Blight, M. G., Ruppel, E. K., & Schoenbauer, K. V. (2017). Sense of community on Twitter and Instagram: Exploring the roles of motives and parasocial relationships. *Cyberpsychology, Behavior, and Social Networking*, 20(5), 314–319. <https://doi.org/10.1089/cyber.2016.0505>
- Boatright, M. D. (2010). Graphic journeys: Graphic novels' representations of immigrant experiences. *Journal of Adolescent & Adult Literacy*, 53(6), 468–476. <https://doi.org/10.1598/JAAL.53.6.3>
- Boden, M. (2007). Creativity and conceptual art. In P. Goldie & E. Schellekens (Eds.), *Philosophy and Conceptual Art* (pp. 216–237). Oxford University Press.
- Booth, W. C. (1961). *The Rhetoric of Fiction* (1st ed.). University of Chicago Press.
- Bouchard, S., Bernier, F., Boivin, É., Dumoulin, S., Laforest, M., Guitard, T., Robillard, G., Monthuy-Blanc, J., & Renaud, P. (2013). Empathy toward virtual humans depicting a known or unknown person expressing pain. *Cyberpsychology, Behavior, and Social Networking*, 16(1), 61–71.
<https://doi.org/10.1089/cyber.2012.1571>
- Bowes, A., & Katz, A. (2015). Metaphor creates intimacy and temporarily enhances theory of mind. *Memory & Cognition*, 43(6), 953–963. <https://doi.org/10.3758/s13421-015-0508-4>

- Bowman, D. A., & McMahan, R. P. (2007). Virtual reality: How much immersion is enough? *Computer*, 40(7), 36–43. <https://doi.org/10.1109/MC.2007.257>
- Braasch, G. (2010). Communicating science through art. *Ecological Perspectives for Science and Society*, 19(4), 260–262. <https://doi.org/10.14512/gaia.19.4.7>
- Bresciani, J.-P., Ernst, M. O., Drewing, K., Bouyer, G., Maury, V., & Kheddar, A. (2005). Feeling what you hear: Auditory signals can modulate tactile tap perception. *Experimental Brain Research*, 162(2), 172–180. <https://doi.org/10.1007/s00221-004-2128-2>
- Brown, S., Gao, X., Tisdelle, L., Eickhoff, S. B., & Liotti, M. (2011). Naturalizing aesthetics: Brain areas for aesthetic appraisal across sensory modalities. *NeuroImage*, 58(1), 250–258. <https://doi.org/10.1016/j.neuroimage.2011.06.012>
- Bujić, M., Salminen, M., Macey, J., & Hamari, J. (2020). “Empathy Machine”: How virtual reality affects human rights attitudes. *Internet Research*, 30(5), 1407–1425. <https://doi.org/10.1108/INTR-07-2019-0306>
- Bulot, N. J., & Reber, R. (2013). The artful mind meets art history: Toward a psycho-historical framework for the science of art appreciation. *Behavioral and Brain Sciences*, 36(2), 123–137. <https://doi.org/10.1017/S0140525X12000489>
- Burgoon, J. (2002). Nonverbal signals. In M. L. Knapp & J. A. Daly (Eds.), *Handbook of Interpersonal Communication* (3rd ed., pp. 240–299). SAGE Publications Ltd.
- Burkitt, E., Barrett, M., & Davis, A. (2009). Effects of different emotion terms on the size and colour of children’s drawings. *International Journal of Art Therapy*, 14(2), 74–84. <https://doi.org/10.1080/17454830701529567>
- Busselle, R., & Bilandzic, H. (2008). Fictionality and perceived realism in experiencing stories: A model of narrative comprehension and engagement. *Communication Theory*, 18(2), 255–280. <https://doi.org/10.1111/j.1468-2885.2008.00322.x>

- Caplan, S. E. (2007). Relations among loneliness, social anxiety, and problematic internet use. *CyberPsychology & Behavior*, 10(2), 234–242. <https://doi.org/10.1089/cpb.2006.9963>
- Carey, K., Saltz, E., Rosenbloom, J., Micheli, M., Choi, J. O., & Hammer, J. (2017). Toward measuring empathy in virtual reality. *Extended Abstracts Publication of the Annual Symposium on Computer-Human Interaction in Play*, 551–559. <https://doi.org/10.1145/3130859.3131325>
- Carney, J., Dunbar, R., Machin, A., Dávid-Barrett, T., & Júnior, M. S. (2014). Social psychology and the comic-book superhero: A Darwinian approach. *Philosophy and Literature*, 38(1A), 195–215. <https://doi.org/10.1353/phl.2014.0019>
- Carroll, N. (1990). *The Philosophy of Horror: Or, Paradoxes of the Heart* (1st ed.). Routledge.
- Carroll, N. (1997). Art, narrative, and emotion. In M. Hjort & S. Laver (Eds.), *Emotion and the Arts* (1st ed., pp. 190–211). Oxford University Press.
- Carroll, N. (1997). The Intentional Fallacy: Defending Myself. *The Journal of Aesthetics and Art Criticism*, 55(3), 305–309. <https://doi.org/10.2307/431800>
- Carroll, N. (2000). Interpretation and Intention: The debate between hypothetical and actual intentionalism. *Metaphilosophy*, 31(1/2), 75–95.
- Carroll, N. (2004). Art and human nature. *The Journal of Aesthetics and Art Criticism*, 62(2), 95–107. <https://doi.org/10.1111/j.1540-594X.2004.00143.x>
- Chang, A., & O'Sullivan, C. (2005). Audio-haptic feedback in mobile phones. *Extended Abstracts on Human Factors in Computing Systems*, 1264–1267. <https://doi.org/10.1145/1056808.1056892>
- Charron, J.-P. (2017). Music audiences 3.0: Concert-goers' psychological motivations at the dawn of virtual reality. *Frontiers in Psychology*, 8(1): 800. <https://doi.org/10.3389/fpsyg.2017.00800>
- Chen, F. (2003). Localization of 3-D Sound Presented through Headphone—Duration of Sound Presentation and Localization Accuracy. *Journal of the Audio Engineering Society*, 51(12), 1163–1171.

- Chepp, V. (2012). Art as public knowledge and everyday politics: The case of African American spoken word. *Humanity & Society*, 36(3), 220–250. <https://doi.org/10.1177/0160597612451240>
- Chopik, W. J. (2016). The benefits of social technology use among older adults are mediated by reduced loneliness. *Cyberpsychology, Behavior, and Social Networking*, 19(9), 551–556. <https://doi.org/10.1089/cyber.2016.0151>
- Clapton, E. (1992). *Tears In Heaven*. Reprise Records. <https://www.discogs.com/Eric-Clapton-Tears-In-Heaven/release/1917488>
- Clark, T. (2019, March 13). *Netflix says its subscribers watch an average of 2 hours a day—Here's how that compares with TV viewing*. Business Insider. <https://www.businessinsider.com/netflix-viewing-compared-to-average-tv-viewing-nielsen-chart-2019-3>
- Click, M. A., Lee, H., & Holladay, H. W. (2013). Making monsters: Lady Gaga, fan identification, and social media. *Popular Music and Society*, 36(3), 360–379. <https://doi.org/10.1080/03007766.2013.798546>
- Clift, S., Hancox, G., Morrison, I., Hess, B., Kreutz, G., & Stewart, D. (2010). Choral singing and psychological wellbeing: Quantitative and qualitative findings from English choirs in a cross-national survey. *Journal of Applied Arts and Health*, 1(1), 19–34. <https://doi.org/10.1386/jaah.1.1.19/1>
- Cone, E. (1974). *The Composer's Voice*. University of California Press.
- Coplan, A. (2004). Empathic engagement with narrative fictions. *The Journal of Aesthetics and Art Criticism*, 62(2), 141–152. <https://doi.org/10.1111/j.1540-594X.2004.00147.x>
- Coplan, A. (2006). Catching characters emotions: Emotional contagion responses to narrative fiction film. *Film Studies*, 8(1), 26–38. <https://doi.org/10.7227/FS.8.5>

- Corvo, E., & De Caro, W. (2020). COVID-19 and spontaneous singing to decrease loneliness, improve cohesion, and mental well-being: An Italian experience. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(S1): 247. <https://doi.org/10.1037/tra0000838>
- Cowen, A. S., & Keltner, D. (2020). Universal facial expressions uncovered in art of the ancient Americas: A computational approach. *Science Advances*, 6(34), eabb1005. <https://doi.org/10.1126/sciadv.abb1005>
- Cross, I. (2005). Music and social being. *Musicology Australia*, 28(1), 114–126. <https://doi.org/10.1080/08145857.2005.10415281>
- Cross, I. (2014). Music and communication in music psychology. *Psychology of Music*, 42(6), 809–819. <https://doi.org/10.1177/0305735614543968>
- Cross, I., & Morley, I. (2009). The evolution of music: Theories, definitions and the nature of the evidence. In S. Malloch & C. Trevarthen (Eds.), *Communicative Musicality: Exploring the Basis of Human Companionship* (pp. 61–81). Oxford University Press.
- Crusco, A. H., & Wetzel, C. G. (1984). The Midas Touch: The effects of interpersonal touch on restaurant tipping. *Personality and Social Psychology Bulletin*, 10(4), 512–517. <https://doi.org/10.1177/0146167284104003>
- Cummings, J. J., & Bailenson, J. N. (2016). How immersive is enough? A meta-analysis of the effect of immersive technology on user presence. *Media Psychology*, 19(2), 272–309. <https://doi.org/10.1080/15213269.2015.1015740>
- Cummings, J. J., Tsay-Vogel, M., Cahill, T. J., & Zhang, L. (2021). Effects of immersive storytelling on affective, cognitive, and associative empathy: The mediating role of presence. *New Media & Society*, Advance online copy. <https://doi.org/10.1177/1461444820986816>
- Cupchik, G. C. (2002). The evolution of psychical distance as an aesthetic concept. *Culture & Psychology*, 8(2), 155–187. <https://doi.org/10.1177/1354067X02008002437>

- Cupchik, G. C., Vartanian, O., Crawley, A., & Mikulis, D. J. (2009). Viewing artworks: Contributions of cognitive control and perceptual facilitation to aesthetic experience. *Brain and Cognition*, 70(1), 84–91. <https://doi.org/10.1016/j.bandc.2009.01.003>
- Curtis, D. J., Reid, N., & Ballard, G. (2012). Communicating ecology through art: What scientists think. *Ecology and Society*, 17(2): 3. <https://doi.org/10.5751/ES-04670-170203>
- Danto, A. C. (1984). Philosophy as and of Literature. *Proceedings and Addresses of the American Philosophical Association*, 58(1), 5–20. <https://doi.org/10.2307/3131555>
- Davies, S. (2006). Aesthetic Judgements, Artworks and Functional Beauty. *The Philosophical Quarterly*, 56(223), 224–241. <https://doi.org/10.1111/j.1467-9213.2006.00439.x>
- D'Ausilio, A., Novembre, G., Fadiga, L., & Keller, P. E. (2015). What can music tell us about social interaction? *Trends in Cognitive Sciences*, 19(3), 111–114. <https://doi.org/10.1016/j.tics.2015.01.005>
- De Kort, Y. A. W., & Ijsselstein, W. A. (2008). People, places, and play: Player experience in a socio-spatial context. *Computers in Entertainment*, 6(2), 1–11. <https://doi.org/10.1145/1371216.1371221>
- DeCesare, M., & Wang, H. (2021). The Use of AR and VR to Change the Future of Music. *Wharton Neuroscience Initiative*. http://neuro.wharton.upenn.edu/community/winss_scholar_article4/
- Denisoff, R. S. (1983). *Sing a song of social significance* (2nd ed.). Bowling Green State University Popular Press.
- Derks, D., Fischer, A., & Bos, A. (2008). The role of emotion in computer-mediated communication: A review. *Computers in Human Behavior*, 24(3), 766–785. <https://doi.org/doi:10.1016/j.chb.2007.04.004>
- Deroy, O., Auvray, M., Hayward, V., & Fasiello, I. (2013). Audio-tactile crossmodal correspondences. *Multisensory Research*, 26(1–2), 73–73. <https://doi.org/10.1163/22134808-000S0049>

- Deroy, O., Fasiello, I., Hayward, V., & Auvray, M. (2016). Differentiated audio-tactile correspondences in sighted and blind individuals. *Journal of Experimental Psychology: Human Perception and Performance*, 42(8), 1204–1214. <https://doi.org/10.1037/xhp0000152>
- Dickie, G. (1969). Defining art. *American Philosophical Quarterly*, 6(3), 253–256.
- Dickie, G., & Wilson, W. K. (1995). The Intentional Fallacy: Defending Beardsley. *The Journal of Aesthetics and Art Criticism*, 53(3), 233–250. <https://doi.org/10.2307/431349>
- Dill-Shackleford, K. E., Vinney, C., & Hopper-Losenicky, K. (2016). Connecting the dots between fantasy and reality: The social psychology of our engagement with fictional narrative and its functional value. *Social and Personality Psychology Compass*, 10(11), 634–646. <https://doi.org/10.1111/spc3.12274>
- DiPaolo, M. (2014). *War, Politics and Superheroes: Ethics and Propaganda in Comics and Film*. McFarland & Company.
- Dipert, R. R. (1986). Art, artifacts, and regarded intentions. *American Philosophical Quarterly*, 23(4), 401–408.
- Dissanayake, E. (1990). *What Is Art For?* (1st ed.). University of Washington Press.
- Dissanayake, E. (2007). What art is and what art does: An overview on contemporary evolutionary hypothesis. In C. Martindale, P. Locher, & V. Petrov (Eds.), *Evolutionary and Neurocognitive Approaches to Aesthetics, Creativity, and the Arts* (pp. 1–14). Baywood Publishing Company, Inc.
- Djikic, M., Oatley, K., & Moldoveanu, M. C. (2013). Reading other minds: Effects of literature on empathy. *Scientific Study of Literature*, 3(1), 28–47. <https://doi.org/10.1075/ssol.3.1.06dji>
- Dunbar, R. (2012). On the Evolutionary Function of Song and Dance. In N. Bannan (Ed.), *Music, Language, and Human Evolution* (pp. 201–214). Oxford University Press.

- Earnhardt, A. C., & Haridakis, P. M. (2009). An examination of fan-athlete interaction: Fandom, parasocial interaction, and identification. *Ohio Communication Journal*, 47(1), 27–53.
<https://doi.org/10.1123/IJSC.5.4.481>
- Eaton, M. M. (1982). A strange kind of sadness. *The Journal of Aesthetics and Art Criticism*, 41(1): 51.
<https://doi.org/10.2307/430823>
- Eerola, T., Vuoskoski, J. K., & Kautiainen, H. (2016). Being moved by unfamiliar sad music is associated with high empathy. *Frontiers in Psychology*, 7: 1176.
<https://doi.org/10.3389/fpsyg.2016.01176>
- Eitan, Z., & Rothschild, I. (2011). How music touches: Musical parameters and listeners' audio-tactile metaphorical mappings. *Psychology of Music*, 39(4), 449–467.
<https://doi.org/10.1177/0305735610377592>
- Eitan, Z., & Timmers, R. (2010). Beethoven's last piano sonata and those who follow crocodiles: Cross-domain mappings of auditory pitch in a musical context. *Cognition*, 114(3), 405–422.
<https://doi.org/10.1016/j.cognition.2009.10.013>
- Elliott, R. K. (1966). Aesthetic theory and the experience of art. In *Proceedings of the Aristotelian Society* (Vol. 67, pp. 111–126). Oxford University Press. www.jstor.org/stable/4544740
- Ellis, R. J., & Simons, R. F. (2005). The impact of music on subjective and physiological indices of emotion while viewing films. *Psychomusicology: A Journal of Research in Music Cognition*, 19(1), 15–40.
<https://doi.org/10.1037/h0094042>
- Elmore, B., & Crane, R. M. (2007). *Social distance and loneliness as they relate to headphones used with portable audio technology*. American Psychological Association. <http://doi.apa.org/get-pe-doi.cfm?doi=10.1037/e656412007-001>
- Escalas, J. E., & Stern, B. B. (2003). Sympathy and empathy: Emotional responses to advertising dramas. *Journal of Consumer Research*, 29(4), 566–578. <https://doi.org/10.1086/346251>

- Esteves, A. (2017, October 10). *When VR meets reality – how live concerts could be enhanced by 21st-century opera glasses*. The Conversation. <http://theconversation.com/when-vr-meets-reality-how-live-concerts-could-be-enhanced-by-21st-century-opera-glasses-85409>
- Evans, B., Munekata, N., & Ono, T. (2014). Does the audience hear my heart? - Comparing the physiological responses of listeners with those of the composer: *Proceedings of the International Conference on Physiological Computing Systems*, 161–166. <https://doi.org/10.5220/0004810301610166>
- Eyerman, R., & Jamison, A. (1998). *Music and Social Movements: Mobilizing Traditions in the Twentieth Century*. Cambridge University Press.
- Fancourt, D., & Perkins, R. (2018). The effects of mother–infant singing on emotional closeness, affect, anxiety, and stress hormones. *Music & Science*, 1(10), 1–10. <https://doi.org/10.1177/2059204317745746>
- Faustino, D. B., Gabriele, S., Ibrahim, R., Theus, A.-L., & Girouard, A. (2017). SensArt demo: A multisensory prototype for engaging with visual art. *Proceedings of the ACM International Conference on Interactive Surfaces and Spaces*, 462–465. <https://doi.org/10.1145/3132272.3132290>
- Feagin, S. L. (1983). The Pleasures of Tragedy. *American Philosophical Quarterly*, 20(1), 95–104.
- Ferguson, G. M., Costigan, C. L., Clarke, C. V., & Ge, J. S. (2016). Introducing remote enculturation: Learning your heritage culture from afar. *Child Development Perspectives*, 10(3), 166–171. <https://doi.org/10.1111/cdep.12181>
- Fernández-Aguilar, L., Ricarte, J., Ros, L., & Latorre, J. M. (2018). Emotional differences in young and older adults: Films as mood induction procedure. *Frontiers in Psychology*, 9: 1110. <https://doi.org/10.3389/fpsyg.2018.01110>
- Fitch, W. T., von Graevenitz, A., & Nicolas, E. (2009). Bio-aesthetics and the aesthetic trajectory: A dynamic cognitive and cultural perspective. In *Neuroaesthetics* (pp. 59–101). Baywood Publishing Co.

- Foellmer, S. (2016). Choreography as a medium of protest. *Dance Research Journal*, 48(3), 58–69.
<https://doi.org/10.1017/S0149767716000395>
- Frijda, N. (n.d.). The laws of emotion. *American Psychologist*, 43(5), 349–358.
<https://doi.org/10.1037/0003-066X.43.5.349>
- Frijda, N., & Schram, D. (1995). Emotions and cultural products: Introduction. *Poetics*, 23(1), 1–6.
[https://doi.org/10.1016/0304-422X\(95\)90009-W](https://doi.org/10.1016/0304-422X(95)90009-W)
- Fumagalli, E., Lee, J., & Shrum, L. J. (2019). Chronic loneliness and consumer responses to interpersonal haptic experiences. *The Association for Consumer Research*, 47: 3.
- Galgut, E. (2001). The poetry and the pity: Hume's account of tragic pleasure. *The British Journal of Aesthetics*, 41(4), 411–424. <https://doi.org/10.1093/bjaesthetics/41.4.411>
- Garrido, S., & Schubert, E. (2015). Moody melodies: Do they cheer us up? A study of the effect of sad music on mood. *Psychology of Music*, 43(2), 244–261.
<https://doi.org/10.1177/0305735613501938>
- Gerdes, K. E., Segal, E. A., & Lietz, C. A. (2010). Conceptualising and measuring empathy. *British Journal of Social Work*, 40(7), 2326–2343. <https://doi.org/10.1093/bjsw/bcq048>
- Gerger, G., Leder, H., & Kremer, A. (2014). Context effects on emotional and aesthetic evaluations of artworks and IAPS pictures. *Acta Psychologica*, 151(1), 174–183.
<https://doi.org/10.1016/j.actpsy.2014.06.008>
- Geringer, J. M., Cassidy, J. W., & Byo, J. L. (1997). Non-music majors' cognitive and affective responses to performance and programmatic music videos. *Journal of Research in Music Education*, 45(2), 221–233. <https://doi.org/10.2307/3345582>
- Gescheider, G. A., & Niblette, R. K. (1967). Cross-modality masking for touch and hearing. *Journal of Experimental Psychology*, 74(3), 313–320. <https://doi.org/10.1037/h0024700>

- Goldstein, T. R. (2009). The pleasure of unadulterated sadness: Experiencing sorrow in fiction, nonfiction, and “in person.” *Psychology of Aesthetics, Creativity, and the Arts*, 3(4), 232–237.
<https://doi.org/10.1037/a0015343>
- Gomes, N., Iranfar, S., Aridhi, S., & Guyon, A. (2020). Physiological and psychological effects of rapid relaxation devices using sensorial immersion: A pilot study. *Journal of Interdisciplinary Methodologies and Issues in Science*, 9(1), 1–35. <https://doi.org/10.18713/JIMIS-021120-9-1>
- Gonzales, E. (2020, June 3). *Obama to Young Black Americans: “I Want You to Know That You Matter.”* Harper’s Bazaar. <https://www.harpersbazaar.com/culture/politics/a32759234/barack-obama-george-floyd-speech/>
- Grant, K. (2016). The Transformational Use of Video in Online Learning. In W. Kilgore (Ed.), *Humanizing Online Teaching and Learning*. Whitney Kilgore.
<https://openpress.usask.ca/humanmooc/>
- Green, M. C., Brock, T. C., & Kaufman, G. F. (2004). Understanding media enjoyment: The role of transportation into narrative worlds. *Communication Theory*, 14(4), 311–327.
<https://doi.org/10.1111/j.1468-2885.2004.tb00317.x>
- Green, M. C., Chatham, C., & Sestir, M. A. (2012). Emotion and transportation into fact and fiction. *Scientific Study of Literature*, 2(1), 37–59. <https://doi.org/10.1075/ssol.2.1.03gre>
- Greene, M. (1995). *Releasing the Imagination: Essays on Education, the Arts, and Social Change*. Jossey-Bass Education.
- Gregor, M. J. (1983). Baumgarten’s “Aesthetica.” *The Review of Metaphysics*, 37(2), 357–385.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2(3), 271–299. <https://doi.org/10.1037/1089-2680.2.3.271>

- Gross, J. J., John, O. P., & Richards, J. M. (2000). The dissociation of emotion expression from emotion experience: A personality perspective. *Personality and Social Psychology Bulletin*, 26(6), 712–726. <https://doi.org/10.1177/0146167200268006>
- Gu, X., & Tse, C.-S. (2016). Narrative perspective shift at retrieval: The psychological-distance-mediated-effect on emotional intensity of positive and negative autobiographical memory. *Consciousness and Cognition*, 45, 159–173. <https://doi.org/10.1016/j.concog.2016.09.001>
- Haans, A., de Bruijn, R., & IJsselsteijn, W. A. (2014). A virtual Midas Touch? Touch, compliance, and confederate bias in mediated communication. *Journal of Nonverbal Behavior*, 38(3), 301–311. <https://doi.org/10.1007/s10919-014-0184-2>
- Hadi, R., & Valenzuela, A. (2014). A meaningful embrace: Contingent effects of embodied cues of affection. *Journal of Consumer Psychology*, 24(4), 520–532. <https://doi.org/10.1016/j.jcps.2014.02.001>
- Hagberg, G. L. (1998). *Art as Language: Wittgenstein, Meaning, and Aesthetic Theory*. Cornell University Press.
- Halpern, J. (1992). Effects of historical and analytical teaching approaches on music appreciation. *Journal of Research in Music Education*, 40(1), 39–46. <https://doi.org/10.2307/3345773>
- Han, J. J., & Gershoff, A. D. (2018). When good things feel closer and bad things feel farther: The role of perceived control on psychological distance perception. *Journal of Consumer Psychology*, 28(4), 629–643. <https://doi.org/10.1002/jcpy.1034>
- Hanich, J., Wagner, V., Shah, M., Jacobsen, T., & Menninghaus, W. (2014). Why we like to watch sad films: The pleasure of being moved in aesthetic experiences. *Psychology of Aesthetics, Creativity, and the Arts*, 8(2), 130–143. <https://doi.org/10.1037/a0035690>

- Hanks, L., Line, N., & Kim, W. G. (2017). The impact of the social service-scape, density, and restaurant type on perceptions of interpersonal service quality. *International Journal of Hospitality Management*, 61(1), 35–44. <https://doi.org/10.1016/j.ijhm.2016.10.009>
- Hargreaves, D. J., & North, A. C. (1999). The functions of music in everyday life: Redefining the social in music psychology. *Psychology of Music*, 27(1), 71–83.
<https://doi.org/10.1177/0305735699271007>
- Harper, T. (2015). Aura, iteration, and action: Digital technology and the jouissance of live music. In A. Jones & R. J. Bennett (Eds.), *The Digital Evolution of Live Music* (pp. 17–28). Chandos Publishing.
- Harris, P. L., Johnson, C. N., Hutton, D., Andrews, G., & Cooke, T. (1989). Young children's Theory of Mind and emotion. *Cognition and Emotion*, 3(4), 379–400.
<https://doi.org/10.1080/02699938908412713>
- Hartley, E. L., & Hartley, R. E. (1952). The importance and nature of communication. In A. Knopf (Ed.), *Fundamentals of Social Psychology* (pp. 16–35). Hastings House.
<https://doi.org/10.1037/13369-002>
- Hastings, P. D., Zahn-Waxler, C., & McShane, K. (2006). We are, by nature, moral creatures: Biological bases of concern for others. In *Handbook of moral development* (pp. 483–516). Lawrence Erlbaum Associates Publishers.
- Hayes, A. F. (2017). *Introduction to Mediation, Moderation, and Conditional Process Analysis, Second Edition: A Regression-Based Approach* (2nd ed.). Guilford Publications. doi.org/10.1111/jedm.12050
- Heimbach, I., Schiller, B., Strufe, T., & Hinz, O. (2015). Content virality on online social networks: Empirical evidence from Twitter, Facebook, and Google+ on German news websites. *Proceedings of the 26th ACM Conference on Hypertext & Social Media*, 39–47.
<https://doi.org/10.1145/2700171.2791032>

- Helweg-Larsen, M., Cunningham, S. J., Carrico, A., & Pergram, A. M. (2004). To nod or not to nod: An observational study of nonverbal communication and status in female and male college students. *Psychology of Women Quarterly*, 28(4), 358–361. <https://doi.org/10.1111/j.1471-6402.2004.00152.x>
- Herbert, R. (2011). Musical and non-musical involvement in daily life: The case of absorption. *Musicae Scientiae*, 16(1), 41–66. <https://doi.org/10.1177/1029864911423161>
- Herbert, R. (2012) Modes of Music Listening and Modes of Subjectivity in Everyday Life. *Journal of Sonic Studies*, 2 (1). pp. 1-24.
- Hewlett, B. S., & Cavalli-Sforza, L. L. (1986). Cultural transmission among Aka Pygmies. *American Anthropologist*, 88(4), 922–934. <https://doi.org/10.1525/aa.1986.88.4.02a00100>
- Hirsch, E. D. (1984). On Justifying Interpretive Norms. *The Journal of Aesthetics and Art Criticism*, 43(1), 89–91. <https://doi.org/10.2307/430195>
- Hock, S. J., & Bagchi, R. (2018). The impact of crowding on calorie consumption. *Journal of Consumer Research*, 44(5), 1123–1140. <https://doi.org/10.1093/jcr/ucx088>
- Holland, S., Bouwer, A., & Hödl, O. (2018). Haptics for the development of fundamental rhythm skills, including multi-limb coordination. In S. Papetti & C. Saitis (Eds.), *Musical Haptics* (pp. 215–237). Springer International Publishing.
- Holt, F. (2010). The economy of live music in the digital age. *European Journal of Cultural Studies*, 13(2), 243–261. <https://doi.org/10.1177/1367549409352277>
- Hong, S., Hibberd, A., & Hibberd, J. (2018). Art as a therapeutic medium to combat social isolation and loneliness. *International Journal of Therapy and Rehabilitation*, 25(6), 213–213. <https://doi.org/10.12968/ijtr.2018.25.6.213>

- Horie, R., Wada, M., & Watanabe, E. (2018). Participation in a virtual reality concert via brainwave and heartbeat. In W. Chung & C. S. Shin (Eds.), *Advances in Affective and Pleasurable Design* (pp. 276–284). Springer International Publishing. https://doi.org/10.1007/978-3-319-60495-4_30
- Horton, D., & Wohl, R. R. (1956). Mass communication and para-social interaction; observations on intimacy at a distance. *Psychiatry*, 19(3), 215–229.
<https://doi.org/10.1080/00332747.1956.11023049>
- Hove, M. J., Martinez, S. A., & Stupacher, J. (2020). Feel the bass: Music presented to tactile and auditory modalities increases aesthetic appreciation and body movement. *Journal of Experimental Psychology: General*, 149(6), 1137–1147. <https://doi.org/10.1037/xge0000708>
- How has Covid-19 changed media consumption?* (2020, September 30). Oxford Business Group.
<https://oxfordbusinessgroup.com/news/how-has-covid-19-changed-media-consumption>
- Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, 26(6), 655–672. <https://doi.org/10.1177/0164027504268574>
- Human, D. (1758). Of Tragedy. In *Essays: Moral, Political, and Literary* (pp. 216–225). Liberty Classics.
- Huron, D. (2015). Affect induction through musical sounds: An ethological perspective. *Philosophical Transactions of the Royal Society: Biological Sciences*, 370(1664): 20140098.
<https://doi.org/10.1098/rstb.2014.0098>
- Hutson-Comeaux, S. L., & Kelly, J. R. (2002). Gender stereotypes of emotional reactions: How we judge an emotion as valid. *Sex Roles*, 47(1), 1–10.
<https://doi.org/doi.org/10.1023/A:1020657301981>
- Ijsselstein, W., & Riva, G. (2003). Being There: The experience of presence in mediated environments. In W. Ijsselstein & G. Riva (Eds.), *Studies in New Technologies and Practices in Communication* (pp. 3–16). IOS Press.

- Imschloss, M., & Kuehnl, C. (2019). Feel the music! Exploring the cross-modal correspondence between music and haptic perceptions of softness. *Journal of Retailing*, 95(4), 158–169. <https://doi.org/10.1016/j.jretai.2019.10.004>
- Inagaki, T. K., Ray, L. A., Irwin, M. R., Way, B. M., & Eisenberger, N. I. (2016). Opioids and social bonding: Naltrexone reduces feelings of social connection. *Social Cognitive and Affective Neuroscience*, 11(5), 728–735. <https://doi.org/10.1093/scan/nsw006>
- Inman, A. G., Howard, E. E., Beaumont, R. L., & Walker, J. A. (2007). Cultural transmission: Influence of contextual factors in Asian Indian immigrant parents' experiences. *Journal of Counseling Psychology*, 54(1), 93–100. <https://doi.org/10.1037/0022-0167.54.1.93>
- Irving, M. (2020). *The Feelbelt adds surround haptic feedback to music, movies and games*. New Atlas. <https://newatlas.com/wearables/feelbelt-haptic-feedback-music-movies-games/>
- Iseminger, G. (1996). Actual Intentionalism vs. Hypothetical Intentionalism. *The Journal of Aesthetics and Art Criticism*, 54(4), 319–326. <https://doi.org/10.2307/431914>
- Iveson, S. (2018). *Exploring the concepts of immersion and why headphones enhance the player experience in 21st century online competitive video games* [Masters Thesis, University of Huddersfield]. <http://eprints.hud.ac.uk/id/eprint/34839/>
- James, W. T. (1932). A study of the expression of bodily posture. *The Journal of General Psychology*, 7(2), 405–437. <https://doi.org/10.1080/00221309.1932.9918475>
- Janssen, J. H., Bailenson, J. N., IJsselstein, W. A., & Westerink, J. H. D. M. (2010). Intimate heartbeats: Opportunities for affective communication technology. *IEEE Transactions on Affective Computing*, 1(2), 72–80. <https://doi.org/10.1109/T-AFFC.2010.13>
- Jarzyna, C. L. (2020). Parasocial interaction, the COVID-19 quarantine, and digital age media. *Human Arenas*, Advance online copy. <https://doi.org/10.1007/s42087-020-00156-0>

- Jenkins, L. M., & Andrewes, D. G. (2012). A new set of standardised verbal and non-verbal contemporary film stimuli for the elicitation of emotions. *Brain Impairment*, 13(2), 212–227.
<https://doi.org/10.1017/BrImp.2012.18>
- Jin, S.-A. A. (2010). Parasocial interaction with an avatar in Second Life: A typology of the self and an empirical test of the mediating role of social presence. *Presence: Teleoperators and Virtual Environments*, 19(4), 331–340. https://doi.org/10.1162/PRES_a_00001
- Jin, S.-A. A., & Park, N. (2009). Parasocial interaction with my avatar: Effects of interdependent self-construal and the mediating role of self-presence in an avatar-Based console game, Wii. *CyberPsychology & Behavior*, 12(6), 723–727. <https://doi.org/10.1089/cpb.2008.0289>
- Johnson, S. G. B., & Steinerberger, S. (2019). Intuitions about mathematical beauty: A case study in the aesthetic experience of ideas. *Cognition*, 189, 242–259.
<https://doi.org/10.1016/j.cognition.2019.04.008>
- Jucker, J.-L., Barrett, J. L., & Wlodarski, R. (2014). “I just don’t get it”: Perceived artists’ intentions affect art evaluations. *Empirical Studies of the Arts*, 32(2), 149–182.
<https://doi.org/10.2190/EM.32.2.c>
- Judge, M., Fernando, J. W., Paladino, A., Mikolajczak, G., & Kashima, Y. (2020). Lay concepts of art, craft, and manufacture and the implications for sustainable consumption. *Journal of Social Issues*, 76(1), 19–34. <https://doi.org/10.1111/josi.12368>
- Juslin, P. N. (2013). From everyday emotions to aesthetic emotions: Towards a unified theory of musical emotions. *Physics of Life Reviews*, 10(3), 235–266.
<https://doi.org/10.1016/j.plrev.2013.05.008>
- Juslin, P. N., & Timmers, R. (2010). Expression and communication of emotion in music performance. In P. Juslin & J. Sloboda (Eds.), *Handbook of Music and Emotion: Theory, Research, Applications* (pp. 453–489). Oxford University Press.

- Kallinen, K., & Ravaja, N. (2004). Comparing speakers versus headphones in listening to news from a computer – individual differences and psychophysiological responses. *Computers in Human Behavior*, 23(2), 303–317. <https://doi.org/10.1016/j.chb.2004.10.014>
- Kallinen, K., & Ravaja, N. (2006). Emotion perceived and emotion felt: Same and different. *Musicae Scientiae*, 10(2), 191–213. <https://doi.org/10.1177/102986490601000203>
- Kandaurova, M., & Lee, S. H. (Mark). (2019). The effects of Virtual Reality (VR) on charitable giving: The role of empathy, guilt, responsibility, and social exclusion. *Journal of Business Research*, 100(1), 571–580. <https://doi.org/10.1016/j.jbusres.2018.10.027>
- Kappers, A., van Erp, J., Begmann-Tiest, W., & van der Helm, F. C. T. (2010). Haptics: Generating and perceiving tangible sensations. *EuroHaptics: International Conference on Human Haptic Sensing and Touch Enabled Computer Application*, 476.
- Kaya, M., Steffens, P., Hearn, G., & Graham, P. (2010). How can entrepreneurial musicians use electronic social networks to diffuse their music? *Proceedings of the 7th AGSE International Entrepreneurship Research Exchange*, 679–691.
- Keats, J. (2011, May 13). *Ode to a Nightingale by John Keats*. Poetry.Com. <https://www.poetry.com/poem/23406>
- Keen, S. (2006). A theory of narrative empathy. *Narrative*, 14(3), 207–236.
- Kiernan, F., Krause, A. E., & Davidson, J. W. (2021). The impact of biographical information about a composer on emotional responses to their music. *Musicae Scientiae*, Advanced online copy. <https://doi.org/10.1177/1029864920988883>
- Kim, J., Kim, J., & Yang, H. (2019). Loneliness and the use of social media to follow celebrities: A moderating role of social presence. *The Social Science Journal*, 56(1), 21–29. <https://doi.org/10.1016/j.sosci.2018.12.007>

- Kim, J., & Song, H. (2016). Celebrity's self-disclosure on Twitter and parasocial relationships: A mediating role of social presence. *Computers in Human Behavior*, 62, 570–577.
<https://doi.org/10.1016/j.chb.2016.03.083>
- King, M. (2018). Working to address the loneliness epidemic: Perspective-taking, presence, and self-disclosure. *American Journal of Health Promotion*, 32(5), 1315–1317.
<https://doi.org/10.1177/0890117118776735c>
- Kirk, U., Skov, M., Hulme, O., Christensen, M. S., & Zeki, S. (2009). Modulation of aesthetic value by semantic context: An fMRI study. *NeuroImage*, 44(3), 1125–1132.
<https://doi.org/10.1016/j.neuroimage.2008.10.009>
- Kivy, P. (1980). *The Corded Shell: Reflections on Musical Expression*. Princeton University Press.
- Kivy, P. (1988). Hearing the emotions. *Philosophic Exchange*, 19(1), 1–16.
- Kivy, P. (1995). *Authenticities: Philosophical Reflections on Musical Performance* (1st ed.). Cornell University Press.
- Knight, D. K., & Young Kim, E. (2007). Japanese consumers' need for uniqueness: Effects on brand perceptions and purchase intention. *Journal of Fashion Marketing and Management: An International Journal*, 11(2), 270–280. <https://doi.org/10.1108/13612020710751428>
- Knight, S., Spiro, N., & Cross, I. (2017). Look, listen and learn: Exploring effects of passive entrainment on social judgements of observed others. *Psychology of Music*, 45(1), 99–115.
<https://doi.org/10.1177/0305735616648008>
- Koelsch, S., Kasper, E., Sammler, D., Schulze, K., Gunter, T., & Friederici, A. D. (2004). Music, language and meaning: Brain signatures of semantic processing. *Nature Neuroscience*, 7(3), 302–307. <https://doi.org/10.1038/nn1197>

- Koetsier, J. (2020, September 26). *Global Online Content Consumption Doubled In 2020*. Forbes.
<https://www.forbes.com/sites/johnkoetsier/2020/09/26/global-online-content-consumption-doubled-in-2020/>
- Kohnen, M., Denk, F., Llorca-Bofi, J., Vorlaender, M., & Kollmeier, B. (2019, September). Loudness in different rooms versus headphone reproduction: Is there a mismatch even after careful equalization? *Proceedings of the 23rd International Congress on Acoustics*. International Congress on Acoustics, Aachen, Germany. <https://doi.org/10.18154/RWTH-CONV-239808>
- Konečni. (2015). Emotion in painting and art installations. *The American Journal of Psychology*, 128(3), 305–322. <https://doi.org/10.5406/amerjpsyc.128.3.0305>
- Konecni, V. (2012). Composers' creative process: The role of life-events, emotion and reason. In D. Hargreaves, D. Miell, & R. MacDonald (Eds.), *Musical Imaginations: Multidisciplinary Perspectives on Creativity, Performance and Perception* (p. 496). OUP Oxford.
- Kramer, M. W., & Hess, J. A. (2002). Communication rules for the display of emotions in organizational settings. *Management Communication Quarterly*, 16(1), 66–80.
<https://doi.org/10.1177/0893318902161003>
- Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet paradox revisited. *Journal of Social Issues*, 58(1), 49–74. <https://doi.org/10.1111/1540-4560.00248>
- Kreuzbauer, R., & Keller, J. (2017). The authenticity of cultural products: A psychological perspective. *Current Directions in Psychological Science*, 26(5), 417–421.
<https://doi.org/10.1177/0963721417702104>
- Kurtin, K. S., O'Brien, N., Roy, D., & Dam, L. (2019). Parasocial relationships with musicians. *The Journal of Social Media in Society*, 8(2), 30–50. <https://doi.org/tsmri.journals.sfu.ca:article/502>
- Kuznetsova, A., Brockhoff, P., & Christensen, R. (2017). *lmerTest Package: Tests in linear mixed effects models*. <https://doi.org/10.18637/JSS.V082.I13>

- Lazarus, R. S., & Alfert, E. (1964). Short-circuiting of threat by experimentally altering cognitive appraisal. *The Journal of Abnormal and Social Psychology*, 69(2), 195–205.
<https://doi.org/10.1037/h0044635>
- Leder, H., Gerger, G., Brieber, D., & Schwarz, N. (2014). What makes an art expert? Emotion and evaluation in art appreciation. *Cognition and Emotion*, 28(6), 1137–1147.
<https://doi.org/10.1080/02699931.2013.870132>
- Lee, A., Moody, B., & Hodges, D. (2003). *Bring me to life*. Wind-Up.
- Lee, E.-J. (2013). Effectiveness of politicians' soft campaign on Twitter versus TV: Cognitive and experiential routes: Twitter Vs. TV. *Journal of Communication*, 63(1), 953–974.
<https://doi.org/10.1111/jcom.12049>
- Lee, E.-J., & Jang, J. (2013). Not so imaginary interpersonal contact with public figures on social network sites: How affiliative tendency moderates its effects. *Communication Research*, 40(1), 27–51. <https://doi.org/10.1177/0093650211431579>
- Lee, J. H., & Nguyen, A. T. (2020). How music fans shape commercial music services: A case study of BTS and ARMY. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–9.
<https://api.semanticscholar.org/CorpusID:221509257>
- Lee, K. M. (2004). Presence, explicated. *Communication Theory*, 14(1), 27–50.
<https://doi.org/10.1111/j.1468-2885.2004.tb00302.x>
- Lee, K. M., Peng, W., Jin, S.-A., & Yan, C. (2006). Can robots manifest personality? An empirical test of personality recognition, social responses, and social presence in human–robot interaction. *Journal of Communication*, 56(4), 754–772. <https://doi.org/10.1111/j.1460-2466.2006.00318.x>
- Lee, S., & Kim, G. J. (2008). Effects of haptic feedback, stereoscopy, and image resolution on performance and presence in remote navigation. *International Journal of Human-Computer Studies*, 66(10), 701–717. <https://doi.org/10.1016/j.ijhcs.2008.05.001>

- Lemmens, P., Cromptvoets, F., Brokken, D., van den Eerenbeemd, J., & de Vries, G.-J. (2009). A body-conforming tactile jacket to enrich movie viewing. *World Haptics 2009 - Third Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, 7–12. <https://doi.org/10.1109/WHC.2009.4810832>
- Lennon, J. (2014). Assembling a revolution: Graffiti, Cairo and the Arab Spring. *Cultural Studies Review*, 20(1). <https://doi.org/10.5130/csr.v20i1.3203>
- Levinson, J. (1982). Music and negative emotion. *Pacific Philosophical Quarterly*, 63(4), 327–346. <https://doi.org/10.1111/j.1468-0114.1982.tb00110.x>
- Levinson, J. (2004). Music as narrative and music as drama. *Mind & Language*, 19(4), 428–441. <https://doi.org/10.1111/j.0268-1064.2004.00267.x>
- Levinson, J. (2005). Philosophical aesthetics: An overview. In J. Levinson (Ed.), *The Oxford Handbook of Aesthetics* (pp. 4–21). Oxford University Press.
- Levinson, J. (2006). Musical chills. In J. Levinson (Ed.), *Contemplating Art: Essays in Aesthetics* (pp. 220–236). Clarendon Press.
- Levinson, J. (2014). *Suffering Art Gladly: The Paradox of Negative Emotion in Art*. Palgrave Macmillan.
- Li, L. Z., & Wang, S. (2020). Prevalence and predictors of general psychiatric disorders and loneliness during COVID-19 in the United Kingdom. *Psychiatry Research*, 291: 113267. <https://doi.org/10.1016/j.psychres.2020.113267>
- Lieberman, A., Amir, O., & Schroeder, J. (2016). “Coming Alive” through headphones: Listening to messages via headphones vs. Speakers increases immersion, presence, and liking. *Advances in Consumer Research*, 44, 21–25.
- Liszio, S., Emmerich, K., & Masuch, M. (2017). The influence of social entities in virtual reality games on player experience and immersion. *Proceedings of the 12th International Conference on the Foundations of Digital Games*, 1–10. <https://doi.org/10.1145/3102071.3102086>

- Livingstone, S. R., & Thompson, W. F. (2009). The emergence of music from the Theory of Mind. *Musicae Scientiae*, 13(2), 83–115. <https://doi.org/10.1177/1029864909013002061>
- Lofelt Basslet Review—A Wearable Subwoofer. (2017, September 6). *MusicTech*.
<https://www.musictech.net/reviews/lofelt-basslet-review/>
- Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication*, 3(2): 321. <https://doi.org/10.1111/j.1083-6101.1997.tb00072.x>
- Lombard, M., Reich, R. D., Grabe, M. E., Bracken, C. C., & Ditton, T. B. (2000). Presence and television. *Human Communication Research*, 26(1), 75–98. <https://doi.org/10.1111/j.1468-2958.2000.tb00750.x>
- Lowenthal, P. R., & Snelson, C. (2017). In search of a better understanding of social presence: An investigation into how researchers define social presence. *Distance Education*, 38(2), 141–159. <https://doi.org/10.1080/01587919.2017.1324727>
- Lundqvist, L.-O., Carlsson, F., Hilmersson, P., & Juslin, P. N. (2009). Emotional responses to music: Experience, expression, and physiology. *Psychology of Music*, 37(1), 61–90. <https://doi.org/10.1177/0305735607086048>
- Maggioni, E., Agostinelli, E., & Obrist, M. (2017). Measuring the added value of haptic feedback. *Quality of Multimedia Experience*, 1–6. <https://doi.org/10.1109/QoMEX.2017.7965670>
- Maira, S. (2000). Henna and Hip Hop: The politics of cultural production and the work of cultural studies. *Journal of Asian American Studies*, 3(3), 329–369. <https://doi.org/10.1353/jaas.2000.0038>
- Mar, R. A., & Oatley, K. (2008). The function of fiction is the abstraction and simulation of social experience. *Perspectives on Psychological Science*, 3(3), 173–192. <https://doi.org/10.1111/j.1745-6924.2008.00073.x>

- Mar, R. A., Oatley, K., Djikic, M., & Mullin, J. (2011). Emotion and narrative fiction: Interactive influences before, during, and after reading. *Cognition & Emotion*, 25(5), 818–833.
<https://doi.org/10.1080/02699931.2010.515151>
- Marin, M. M. (2015). Crossing boundaries: Toward a general model of neuroaesthetics. *Frontiers in Human Neuroscience*, 9: 443. <https://doi.org/10.3389/fnhum.2015.00443>
- Markusen, A., & Brown, A. (2014). From audience to participants: New thinking for the performing arts. *Análise Social*, 49(213), 866–883.
- Marshall, S. K., & Cohen, A. J. (1988). Effects of musical soundtracks on attitudes toward animated geometric figures. *Music Perception*, 6(1), 95–112. <https://doi.org/10.2307/40285417>
- Mastandrea, S., Fagioli, S., & Biasi, V. (2019). Art and psychological well-being: Linking the brain to the aesthetic emotion. *Frontiers in Psychology*, 10: 739. <https://doi.org/10.3389/fpsyg.2019.00739>
- Matsumoto, D. (1993). Ethnic differences in affect intensity, emotion judgments, display rule attitudes, and self-reported emotional expression in an American sample. *Motivation and Emotion*, 17(2), 107–123. <https://doi.org/10.1007/BF00995188>
- Mayer, J. D., DiPaolo, M., & Salovey, P. (1990). Perceiving affective content in ambiguous visual stimuli: A component of emotional intelligence. *Journal of Personality Assessment*, 54(3–4), 772–781.
<https://doi.org/10.1080/00223891.1990.9674037>
- Mazzoni, A., & Bryan-Kinns, N. (2015a). How does it feel like? An exploratory study of a prototype system to convey emotion through haptic wearable devices. *Proceedings of the 7th International Conference on Intelligent Technologies for Interactive Entertainment*. 7th International Conference on Intelligent Technologies for Interactive Entertainment, Torino, Italy.
<https://doi.org/10.4108/icst.intetain.2015.259625>

- Mazzoni, A., & Bryan-Kinns, N. (2015b). Mood Glove: A haptic wearable prototype system to enhance mood music in film. *Entertainment Computing*, 17(1), 9–17.
<https://doi.org/10.1016/j.entcom.2016.06.002>
- McCrum, R. (2010, July 31). *Anne Frank: Was her diary intended as a work of art?* The Guardian.
<https://www.theguardian.com/books/2010/aug/01/anne-frank-diary-robert-mccrum>
- Mellis, D. A., & Tichenor, J. (2005). “I Can Feel the Music”: Haptics in physical design prototyping. *Haptics Symposium World Haptics Conference*, 553–570.
- Menninghaus, W., Wagner, V., Hanich, J., Wassiliwizky, E., Jacobsen, T., & Koelsch, S. (2017). The distancing-embracing model of the enjoyment of negative emotions in art reception. *Behavioral and Brain Sciences*, 40: 347. <https://doi.org/10.1017/S0140525X17000309>
- Menninghaus, W., Wagner, V., Hanich, J., Wassiliwizky, E., Kuehnast, M., & Jacobsen, T. (2015). Towards a psychological construct of being moved. *PLOS ONE*, 10(6): 0128451.
<https://doi.org/10.1371/journal.pone.0128451>
- Menninghaus, W., Wagner, V., Wassiliwizky, E., Jacobsen, T., & Knoop, C. A. (2017). The emotional and aesthetic powers of parallelistic diction. *Poetics*, 63, 47–59.
<https://doi.org/10.1016/j.poetic.2016.12.001>
- Menninghaus, W., Wagner, V., Wassiliwizky, E., Schindler, I., Hanich, J., Jacobsen, T., & Koelsch, S. (2019). What are aesthetic emotions? *Psychological Review*, 126(2), 171–195.
<https://doi.org/10.1037/rev0000135>
- Merrill, J., Omigie, D., & Wald-Fuhrmann, M. (2020). Locus of emotion influences psychophysiological reactions to music. *PLOS ONE*, 15(8), e0237641.
<https://doi.org/10.1371/journal.pone.0237641>
- Milstein, N., & Gordon, I. (2020). Validating measures of electrodermal activity and heart rate variability derived from the Empatica E4 utilized in research settings that involve interactive

- dyadic states. *Frontiers in Behavioral Neuroscience*, 14(1): 148.
<https://doi.org/10.3389/fnbeh.2020.00148>
- Miu, A. C., Pițur, S., & Szentágotai-Tătar, A. (2016). Aesthetic emotions across arts: A comparison between painting and music. *Frontiers in Psychology*, 6, 1951.
<https://doi.org/10.3389/fpsyg.2015.01951>
- Mocaiber, I., Perakakis, P., Pereira, M. G., Pinheiro, W. M., Volchan, E., de Oliveira, L., & Vila, J. (2011). Stimulus appraisal modulates cardiac reactivity to briefly presented mutilation pictures. *International Journal of Psychophysiology*, 81(3), 299–304.
<https://doi.org/10.1016/j.ijpsycho.2011.07.014>
- Mocaiber, I., Pereira, M. G., Erthal, F. S., Machado-Pinheiro, W., David, I. A., Cagy, M., Volchan, E., & de Oliveira, L. (2010). Fact or fiction? An event-related potential study of implicit emotion regulation. *Neuroscience Letters*, 476(2), 84–88. <https://doi.org/10.1016/j.neulet.2010.04.008>
- Montag, M., Sullivan, S., Dickey, S., & Leider, C. (2011). A low-cost, low-latency multi-touch table with haptic feedback for musical applications. *Proceedings of the International Conference on New Interfaces for Musical Expression*, 8–13. <https://doi.org/10.5281/zenodo.1178115>
- Moore, F. (2020). *IFPI Music Listening Report 2020* (p. 17). International Federation of the Phonographic Industry. <https://www.ifpi.org/ifpi-releases-music-listening-2019/>
- Morahan-Martin, J., & Schumacher, P. (2003). Loneliness and social uses of the Internet. *Computers in Human Behavior*, 19(6), 659–671. [https://doi.org/10.1016/S0747-5632\(03\)00040-2](https://doi.org/10.1016/S0747-5632(03)00040-2)
- Morreall, J. (1985). Enjoying negative emotions in fictions. *Philosophy and Literature*, 9(1), 95–103.
<https://doi.org/10.1353/phl.1985.0118>
- Murphy, S. T., Frank, L. B., Chatterjee, J. S., & Baezconde-Garbanati, L. (2013). Narrative versus nonnarrative: The role of identification, transportation, and emotion in reducing health

disparities: Narrative vs. nonnarrative. *Journal of Communication*, 63(1), 116–137.

<https://doi.org/10.1111/jcom.12007>

Most followed accounts on Instagram 2021. (2021). Statista.

<https://www.statista.com/statistics/421169/most-followers-instagram/>

Nadal, M. (2013). The experience of art: Insights from neuroimaging. In S. Finger, D. W. Zaidel, F.

Boller, & J. Bogousslavsky (Eds.), *Progress in Brain Research* (Vol. 204, pp. 135–158). Elsevier.

Nanayakkara, S., Wyse, L., Ong, S., & Taylor, E. (2013). Enhancing musical experience for the hearing-impaired using visual and haptic displays. *Human-Computer Interaction*, 28(2), 115–160.

<https://doi.org/10.1080/07370024.2012.697006>

Narayanan, J., Tai, K., & Kinias, Z. (2013). Power motivates interpersonal connection following social exclusion. *Organizational Behavior and Human Decision Processes*, 122(2), 257–265.

<https://doi.org/10.1016/j.obhdp.2013.08.006>

Navarra, J., Soto-Faraco, S., & Spence, C. (2007). Adaptation to audiotactile asynchrony. *Neuroscience*

Letters, 413(1), 72–76. <https://doi.org/10.1016/j.neulet.2006.11.027>

Newman, G. E. (2019). The psychology of authenticity. *Review of General Psychology*, 23(1), 8–18.

<https://doi.org/10.1037/gpr0000158>

Newman, G. E., Bartels, D. M., & Smith, R. K. (2014). Are artworks more like people than artifacts?

Individual concepts and their extensions. *Topics in Cognitive Science*, 6(4), 647–662.

<https://doi.org/10.1111/tops.12111>

Nowak, K. L., & Biocca, F. (2003). The effect of the agency and anthropomorphism on users' sense of telepresence, copresence, and social presence in virtual environments. *Presence: Teleoperators and*

Virtual Environments, 12(5), 481–494. <https://doi.org/10.1162/105474603322761289>

- Nyström, K., & Lauritzen, S. O. (2005). Expressive bodies: Demented persons' communication in a dance therapy context. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine*, 9(3), 297–317. <https://doi.org/10.1177/1363459305052902>
- Oatley, K. (1999). Why fiction may be twice as true as fact: Fiction as cognitive and emotional simulation. *Review of General Psychology*, 3(2), 101–117. <https://doi.org/10.1037/1089-2680.3.2.101>
- Oliver, M. B., & Bartsch, A. (2011). Appreciation of entertainment: The importance of meaningfulness via virtue and wisdom. *Journal of Media Psychology*, 23(1), 29–33. <https://doi.org/10.1027/1864-1105/a000029>
- Oppenheimer, D. (2008). The secret life of fluency: Trends in cognitive sciences. *Trends in Cognitive Science*, 12(6), 237–241. <https://doi.org/10.1016/j.tics.2008.02.014>.
- Orvell, A., Kross, E., & Gelman, S. A. (2020). “You” speaks to me: Effects of generic-you in creating resonance between people and ideas. *Proceedings of the National Academy of Sciences*, 117(49), 31038–31045. <https://doi.org/10.1073/pnas.2010939117>
- Overgaard, I., & Sørensen, N. Ø. (2015). Can an art museum help in combating loneliness? *Journal of Applied Arts & Health*, 6(2), 187–203. https://doi.org/10.1386/jaah.6.2.187_1
- Paasschen, J. van, Bacci, F., & Melcher, D. P. (2015). The influence of art expertise and training on emotion and preference ratings for representational and abstract artworks. *PLOS ONE*, 10(8), e0134241. <https://doi.org/10.1371/journal.pone.0134241>
- Padmanabhanunni, A., & Pretorius, T. B. (2021). The unbearable loneliness of COVID-19: COVID-19-related correlates of loneliness in South Africa in young adults. *Psychiatry Research*, 296: 113658. <https://doi.org/10.1016/j.psychres.2020.113658>
- Pallavicini, F., & Pepe, A. (2019). Comparing player experience in video games played in virtual reality or on desktop displays: Immersion, flow, and positive emotions. *Extended Abstracts of the Annual*

- Symposium on Computer-Human Interaction in Play Companion Extended Abstracts*, 195–210.
<https://doi.org/10.1145/3341215.3355736>
- Papetti, S., & Saitis, C. (Eds.). (2018). *Musical Haptics*. Springer International Publishing.
<https://doi.org/10.1007/978-3-319-58316-7>
- Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, 70, 153–163.
<https://doi.org/10.1016/j.jesp.2017.01.006>
- Peters, D. (2015). Musical empathy, emotional co-constitution, and the “Musical Other.” *Empirical Musicology Review*, 10(2), 2–15. <https://doi.org/10.18061/emr.v10i1-2.4611>
- Pinkert, M. T. (2016). *A voice of their own: Music and social cohesion in Turkish Alevi life* [Doctoral Dissertation, University of Maryland].
https://drum.lib.umd.edu/bitstream/handle/1903/18554/Pinkert_umd_0117E_17302.pdf?isAllowed=y&sequence=1
- Plath, S. (1962). *Letters of Sylvia Plath Volume II: 1956 – 1963*. Faber & Faber.
- Platt, D. (2007, September 25). Alternate (Season 9, Episode 1). In *Law and Order: Special Victims Unit*. NBC.
- Pons, F., Giroux, M., Murali, M., & Zins, M. (2016). The relationship between density perceptions and satisfaction in the retail setting: Mediation and moderation effects. *Journal of Business Research*, 69(2), 1000–1007. <https://doi.org/10.1016/j.jbusres.2015.09.005>
- Poon, T., & Grohmann, B. (2014). Spatial density and ambient scent: Effects on consumer anxiety. *American Journal of Business*, 29(1), 76–94. <https://doi.org/10.1108/AJB-05-2013-0027>
- Pouliot, L., & Cowen, P. S. (2007). Does perceived realism really matter in media effects? *Media Psychology*, 9(2), 241–259. <https://doi.org/10.1080/15213260701285819>

- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36(4), 717–731. <https://doi.org/10.3758/BF03206553>
- Preston, S. D., & de Waal, F. B. M. (2002). Empathy: Its ultimate and proximate bases. *Behavioral and Brain Sciences*, 25(1), 1–20. <https://doi.org/10.1017/S0140525X02000018>
- Prior, N. (2018). *Popular Music, Digital Technology and Society*. SAGE Publications Ltd.
- Rabinowitch, T.-C., & Cross, I. (2019). Joint rhythmic tapping elicits distinct emotions depending on tap timing and prior musical training. *Emotion*, 19(5), 808–817. <https://doi.org/10.1037/emo0000474>
- Reber, R., Schwarz, N., & Winkielman, P. (1998). Effects of processing fluency on affective judgments. *Psychological Science*, 9, 45–48. <https://doi.org/doi.org/10.1111/1467-9280.00008>
- Reber, R., Schwarz, N., & Winkielman, P. (2004a). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, 8(4), 364–382. https://doi.org/10.1207/s15327957pspr0804_3
- Reber, R., Schwarz, N., & Winkielman, P. (2004b). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, 8(4), 364–382. https://doi.org/10.1207/s15327957pspr0804_3
- Rebuschat, P., Rohrmeier, M., Cross, I., & Hawkins, J. A. (2012). *Language and music as cognitive systems*. OUP Oxford.
- Rentfrow, P. J. (2012). The role of music in everyday life: Current directions in the social psychology of music. *Social and Personality Psychology Compass*, 6(5), 402–416. <https://doi.org/10.1111/j.1751-9004.2012.00434.x>
- Rettie, R. (2005). Connectedness, awareness and social presence. *Proceedings of the 8th International Conference for Presence Research*, 2–9.

- Riberio, A. C. (2014). Heavenly hurt: The joy and value of sad poetry. In J. Levinson (Ed.), *Suffering Art Gladly: The Paradox of Negative Emotion in Art* (pp. 186–206). Palgrave Macmillan.
- Richardson, D. C., Griffin, N. K., Zaki, L., Stephenson, A., Yan, J., Curry, T., Noble, R., Hogan, J., Skipper, J. I., & Devlin, J. T. (2020). Engagement in video and audio narratives: Contrasting self-report and physiological measures. *Scientific Reports*, 10: 11298. <https://doi.org/10.1038/s41598-020-68253-2>
- Riley, S. C. E., Griffin, C., & Morey, Y. (2010). The case for ‘everyday politics’: Evaluating neo-tribal theory as a way to understand alternative forms of political participation, using electronic dance music culture as an example. *Sociology*, 44(2), 345–363.
<https://doi.org/10.1177/0038038509357206>
- Robinson, J. (2004). The art of distancing: How formal devices manage our emotional responses to literature. *The Journal of Aesthetics and Art Criticism*, 62(2), 153–162.
- Rodriguez, A., & Clair, R. P. (1999). Graffiti as communication: Exploring the discursive tensions of anonymous texts. *Southern Communication Journal*, 65(1), 1–15.
<https://doi.org/10.1080/10417949909373152>
- Rolison, J. J., & Edworthy, J. (2012). The role of formal structure in liking for popular music. *Music Perception*, 29(3), 269–284. <https://doi.org/10.1525/mp.2012.29.3.269>
- Roosen, L. J., Klöckner, C. A., & Swim, J. K. (2018). Visual art as a way to communicate climate change: A psychological perspective on climate change–related art. *World Art*, 8(1), 85–110.
<https://doi.org/10.1080/21500894.2017.1375002>
- Rosenberg, R. S., Baughman, S. L., & Bailenson, J. N. (2013). Virtual superheroes: Using superpowers in virtual reality to encourage prosocial behavior. *PLOS ONE*, 8: 55003.
<https://doi.org/10.1371/journal.pone.0055003>

- Rubin, A. M., & Perse, E. M. (1987). Audience activity and soap opera involvement a uses and effects investigation. *Human Communication Research*, 14(2), 246–268. <https://doi.org/10.1111/j.1468-2958.1987.tb00129.x>
- Rubin, A. M., West, D. V., & Mitchell, W. S. (2001). Differences in aggression, attitudes toward women, and distrust as reflected in popular music preferences. *Media Psychology*, 3(1), 25–42. https://doi.org/10.1207/S1532785XMEP0301_02
- Rubin, A., & Step, M. (2000). Impact of motivation, attraction, and parasocial interaction on Talk Radio listening: Journal of broadcasting & electronic Media. *Journal of Broadcasting & Electronic Media*, 44(4), 635–654. https://doi.org/10.1207/s15506878jobem4404_7
- Rubin, R. B., & McHugh, M. P. (1987). Development of parasocial interaction relationships. *Journal of Broadcasting & Electronic Media*, 31(3), 279–292. <https://doi.org/10.1080/08838158709386664>
- Russo, F., Ammirante, P., & Fels, D. (2012). Vibrotactile discrimination of musical timbre. *Journal of Experimental Psychology: Human Perception and Performance*, 38(1), 822–826. <https://doi.org/10.1037/a0029046>
- Sallnäs, E., Rassmus-Gröhn, K., & Sjöström, C. (2000). Supporting presence in collaborative environments by haptic force feedback. *ACM Transactions on Computer-Human Interaction*, 7(4), 461–476. <https://doi.org/10.1145/365058.365086>
- Sallnäs, E.-L. (2010). Haptic feedback increases perceived social presence. In A. M. L. Kappers, J. B. F. van Erp, W. M. Bergmann Tiest, & F. C. T. van der Helm (Eds.), *Haptics: Generating and Perceiving Tangible Sensations* (pp. 178–185). Springer. https://doi.org/10.1007/978-3-642-14075-4_26
- Sánchez Laws, A. L. (2020). Can immersive journalism enhance empathy? *Digital Journalism*, 8(2), 213–228. <https://doi.org/10.1080/21670811.2017.1389286>

- Sauter, D. A., Eisner, F., Ekman, P., & Scott, S. K. (2010). Cross-cultural recognition of basic emotions through nonverbal emotional vocalizations. *Proceedings of the National Academy of Sciences*, 107(6), 2408–2412. <https://doi.org/10.1073/pnas.0908239106>
- Sawada, M., Suda, K., & Ishii, M. (2003). Expression of emotions in dance: Relation between arm movement characteristics and emotion. *Perceptual and Motor Skills*, 97(3), 697–708. <https://doi.org/10.2466/pms.2003.97.3.697>
- Schäfer, K., Saarikallio, S., & Eerola, T. (2020). Music may reduce loneliness and act as social surrogate for a friend: Evidence from an experimental listening study. *Music & Science*, 3(1), 1–16. <https://doi.org/10.1177/2059204320935709>
- Scherer, K. R. (2005). What are emotions? And how can they be measured? *Social Science Information*, 44(4), 695–729. <https://doi.org/10.1177/0539018405058216>
- Schiavio, A., Moran, N., van der Schyff, D., Biasutti, M., & Parncutt, R. (2020). Processes and experiences of creative cognition in seven Western Classical composers. *Musicae Scientiae*, Advanced online copy. <https://doi.org/10.1177/1029864920943931>
- Schier, F. (1983). Tragedy and the community of sentiment. In P. Lamarque (Ed.), *Philosophy and Fiction: Essays in Literary Aesthetics* (pp. 73–92). Aberdeen University Press.
- Schmälzle, R., Häcker, F. E. K., Honey, C. J., & Hasson, U. (2015). Engaged listeners: Shared neural processing of powerful political speeches. *Social Cognitive and Affective Neuroscience*, 10(8), 1137–1143. <https://doi.org/10.1093/scan/nsu168>
- Scholz, B. C. (1994). Rescuing the institutional theory of art: Implicit definitions and folk aesthetics. *The Journal of Aesthetics and Art Criticism*, 52(3), 309–325. <https://doi.org/10.2307/431430>
- Schramm, H., & Wirth, W. (2010). Exploring the paradox of sad-film enjoyment: The role of multiple appraisals and meta-appraisals. *Poetics*, 38(3), 319–335. <https://doi.org/10.1016/j.poetic.2010.03.002>

- Schubert, E. (2013). Emotion felt by the listener and expressed by the music: Literature review and theoretical perspectives. *Frontiers in Psychology*, 4, 837. <https://doi.org/10.3389/fpsyg.2013.00837>
- Schubert, E. (2013). Loved music can make a listener feel negative emotions. *Musicae Scientiae*, 17(1), 11–26. <https://doi.org/10.1177/1029864912461321>
- Schubert, E., Halpern, A. R., Kreutz, G., & Garrido, S. (2018). Attraction to sad music: The role of imagery, absorption, and rumination. *Psychology of Aesthetics, Creativity, and the Arts*, 12(3), 251–258. <https://doi.org/10.1037/aca0000160>
- Schultze, U., & Brooks, J. A. M. (2019). An interactional view of social presence: Making the virtual other “real.” *Information Systems Journal*, 29(3), 707–737. <https://doi.org/10.1111/isj.12230>
- Schürmann, M., Caetano, G., Jousmäki, V., & Hari, R. (2004). Hands help hearing: Facilitatory audiotactile interaction at low sound-intensity levels. *The Journal of the Acoustical Society of America*, 115(2), 830–832. <https://doi.org/10.1121/1.1639909>
- Schutte, N. S., & Stilianović, E. J. (2017). Facilitating empathy through virtual reality. *Motivation and Emotion*, 41(6), 708–712. <https://doi.org/10.1007/s11031-017-9641-7>
- Schutz, M. (2008). Seeing music? What musicians need to know about vision. *Empirical Musicology Review*, 3(3), 83–108. <https://doi.org/10.18061/1811/34098>
- Sellnow, D., & Sellnow, T. (2001). The “Illusion of Life” rhetorical perspective: An integrated approach to the study of music as communication. *Critical Studies in Media Communication*, 18(4), 395–415. <https://doi.org/10.1080/07393180128090>
- Shah, S. G. S., Nogueras, D., van Woerden, H., & Kiparoglou, V. (2019). Effectiveness of digital technology interventions to reduce loneliness in adults: A protocol for a systematic review and meta-analysis. *BMJ Open*, 9(9): 032455. <https://doi.org/10.1136/bmjopen-2019-032455>

- Shah, S. G. S., Nogueras, D., Woerden, H. C. van, & Kiparoglou, V. (2020). The COVID-19 pandemic: A pandemic of lockdown loneliness and the role of digital technology. *Journal of Medical Internet Research*, 22(11), e22287. <https://doi.org/10.2196/22287>
- Shimamura, A. (2012). Toward a science of aesthetics. In S. Palmer & A. Shimamura (Eds.), *Aesthetic Science: Connecting Minds, Brains and Experiences* (Vol. 1, pp. 3–28). Oxford University Press.
- Shin, D. (2018). Empathy and embodied experience in virtual environment: To what extent can virtual reality stimulate empathy and embodied experience? *Computers in Human Behavior*, 78, 64–73. <https://doi.org/10.1016/j.chb.2017.09.012>
- Short, J., Williams, E., & Christie, B. (1976). *The Social Psychology of Telecommunications*. Wiley-Blackwell.
- Slater, M., Howell, J., Steed, A., Pertaub, D.-P., & Garau, M. (2000). Acting in virtual reality. *Proceedings of the Third International Conference on Collaborative Virtual Environments*, 103–110. <https://doi.org/10.1145/351006.351020>
- Slater, M. J., Haslam, S. A., & Steffens, N. K. (2018). Singing it for “us”: Team passion displayed during national anthems is associated with subsequent success. *European Journal of Sport Science*, 18(4), 541–549. <https://doi.org/10.1080/17461391.2018.1431311>
- Slater, M., Sadagic, A., Usoh, M., & Schroeder, R. (2000). Small group behaviour in a virtual and real environment: A comparative study. *Presence*, 9(1), 37–51. <https://doi.org/10.1162/105474600566600>
- Smith, J., & MacLean, K. (2007). Communicating emotion through a haptic link: Design space and methodology. *International Journal of Human-Computer Studies*, 65(4), 376–387. <https://doi.org/10.1016/j.ijhcs.2006.11.006>
- Smith, R. K., & Newman, G. E. (2014). When multiple creators are worse than one: The bias toward single authors in the evaluation of art. *Psychology of Aesthetics, Creativity, and the Arts*, 8(3), 303–310. <https://doi.org/10.1037/a0036928>

- Smuts, A. (2007). The paradox of painful art. *The Journal of Aesthetic Education*, 41(3), 59–76.
- Soliman, M., Peetz, J., & Davydenko, M. (2017). The impact of immersive technology on nature relatedness and pro-environmental behavior. *Journal of Media Psychology*, 29(1), 8–17.
<https://doi.org/10.1027/1864-1105/a000213>
- Song, Y., Dixon, S., Pearce, M. T., & Halpern, A. R. (2016). Perceived and induced emotion responses to popular music: Categorical and dimensional models. *Music Perception: An Interdisciplinary Journal*, 33(4), 472–492.
- Spence, C. (2011). Crossmodal correspondences: A tutorial review. *Attention, Perception, & Psychophysics*, 73(4), 971–995. <https://doi.org/10.3758/s13414-010-0073-7>
- Stankievech, C. (2007). From Stethoscopes to Headphones: An Acoustic Spatialization of Subjectivity. *Leonardo Music Journal*, 17, 55-59. <https://doi.org/10.1162/lmj.2007.17.55>
- Stanton, T. R., & Spence, C. (2020). The Influence of Auditory Cues on Bodily and Movement Perception. *Frontiers in Psychology*, Advance online copy.
<https://doi.org/10.3389/fpsyg.2019.03001>
- Stavrova, O., & Meckel, A. (2017). Perceiving emotion in non-social targets: The effect of trait empathy on emotional contagion through art. *Motivation and Emotion*, 41(4), 492–509.
<https://doi.org/10.1007/s11031-017-9619-5>
- Stecker, R. (1984). Expression of emotion in (some of) the arts. *The Journal of Aesthetics and Art Criticism*, 42(4), 409–418. <https://doi.org/10.2307/430214>
- Steffen, J. H., Gaskin, J. E., Meservy, T. O., Jenkins, J. L., & Wolman, I. (2019). Framework of affordances for virtual reality and augmented reality. *Journal of Management Information Systems*, 36(3), 683–729. <https://doi.org/10.1080/07421222.2019.1628877>

- Steinbeis, N., & Koelsch, S. (2009). Understanding the intentions behind man-made products elicits neural activity in areas dedicated to mental state attribution. *Cerebral Cortex*, 19(3), 619–623.
<https://doi.org/10.1093/cercor/bhn110>
- Steinfeld, N. (2020). To be there when it happened: Immersive journalism, empathy, and opinion on sexual harassment. *Journalism Practice*, 14(2), 240–258.
<https://doi.org/10.1080/17512786.2019.1704842>
- Stephanidis, C., & Salvendy, G. (1998). Toward an information society for all: An international research and development agenda. *International Journal of Human-Computer Interaction*, 10(2), 107–134. https://doi.org/10.1207/s15327590ijhc1002_2
- Stewart, S. M., Zhou, S., Bissell, K., Gower, K., Ki, E.-J., & Allaway, A. (2013). *Artist-fan engagement model: Implications for music consumption and the music industry* [PhD Dissertation]. University of Alabama.
- Stickley, A., Matsubayashi, T., & Ueda, M. (2021). Loneliness and COVID-19 preventive behaviours among Japanese adults. *Journal of Public Health*, 43(1), 53–60.
<https://doi.org/10.1093/pubmed/fdaa151>
- Strohl, M. (2019). Art and painful emotion. *Philosophy Compass*, 14: 12558.
<https://doi.org/10.1111/phc3.12558>
- Stroud, S. (2008). Dewey on Art as Evocative Communication. *Education and Culture*, 23(2), 6–26.
<https://doi.org/10.1353/eac.0.0001>
- Stupacher, J., Wood, G., & Witte, M. (2017). Synchrony and sympathy: Social entrainment with music compared to a metronome. *Psychomusicology: Music, Mind, and Brain*, 27(3), 158–166.
<https://doi.org/10.1037/pmu0000181>
- Szubielska, M., & Niestorowicz, E. (2020). Seeing suppresses haptic pleasure while perceiving contemporary art. *I-Perception*, 11(3), 1–5. <https://doi.org/10.1177/2041669520932948>

Tactsuit X40 | Wearable Haptic Vest. (n.d.). Knoxlabs. Retrieved May 5, 2021, from

<https://www.knoxlabs.com/products/tactsuit-x40>

Takahashi, Y., Kanada, K., Yonekawa, Y., & Harada, N. (2005). A Study on the Relationship between Subjective Unpleasantness and Body Surface Vibrations Induced by High-level Low-frequency Pure Tones. *Industrial Health*, 43(3), 580–587. <https://doi.org/10.2486/indhealth.43.580>

Tal-Or, N., & Cohen, J. (2010). Understanding audience involvement: Conceptualizing and manipulating identification and transportation. *Poetics*, 38(4), 402–418. <https://doi.org/10.1016/j.poetic.2010.05.004>

Tan, S.-L., Spackman, M. P., & Bezdek, M. A. (2007). Viewers' interpretations of film characters' emotions: Effects of presenting film music before or after a character is shown. *Music Perception*, 25(2), 135–152. <https://doi.org/10.1525/mp.2007.25.2.135>

Tarr, B., Launay, J., Cohen, E., & Dunbar, R. (2015). Synchrony and exertion during dance independently raise pain threshold and encourage social bonding. *Biology Letters*, 11(10): 20150767. <https://doi.org/10.1098/rsbl.2015.0767>

Tarr, B., Launay, J., & Dunbar, R. I. M. (2014). Music and social bonding: “Self-other” merging and neurohormonal mechanisms. *Frontiers in Psychology*, 5: 1096. <https://doi.org/10.3389/fpsyg.2014.01096>

Tarr, B., Launay, J., & Dunbar, R. I. M. (2016). Silent disco: Dancing in synchrony leads to elevated pain thresholds and social closeness. *Evolution and Human Behavior*, 37(5), 343–349. <https://doi.org/10.1016/j.evolhumbehav.2016.02.004>

Taruffi, L., & Koelsch, S. (2014). The paradox of music-evoked sadness: An online survey. *PLOS ONE*, 9(10): 110490. <https://doi.org/10.1371/journal.pone.0110490>

Taruskin, R. (1982). On Letting the Music Speak for Itself: Some Reflections on Musicology and Performance. *The Journal of Musicology*, 1(3), 338–349. <https://doi.org/10.2307/763881>

- The Basslet: A wearable subwoofer for your body*. (2017). Kickstarter. Retrieved May 13, 2021, from <https://www.kickstarter.com/projects/basslet/the-basslet-a-wearable-subwoofer-for-your-body>
- Thomas, R., & Rappaport, J. (1996). Art as community narrative: A resource for social change. In M. B. Lykes, A. Banuazizi, R. Liem, & M. Morris (Eds.), *Myths About the Powerless: Contesting Social Inequalities*. Temple University Press.
- Thompson, D. (2012). How Headphones Changed the World. *The Atlantic*.
<https://www.theatlantic.com/technology/archive/2012/05/how-headphones-changed-the-world/257830/>
- Tilburg, W. A. P. V., & Igou, E. R. (2014). From Van Gogh to Lady Gaga: Artist eccentricity increases perceived artistic skill and art appreciation. *European Journal of Social Psychology*, 44(2), 93–103. <https://doi.org/10.1002/ejsp.1999>
- Time spent with music in the United States 2019*. (2019). Statista.
<https://www.statista.com/statistics/828195/time-spent-music/>
- Todd, N. P. M., & Cody, F. W. (2000). Vestibular responses to loud dance music: A physiological basis of the “rock and roll threshold”? *The Journal of the Acoustical Society of America*, 107(1), 496–500. <https://doi.org/10.1121/1.428317>
- Todd, N. P. M., Rosengren, S. M., & Colebatch, J. G. (2008). Tuning and sensitivity of the human vestibular system to low-frequency vibration. *Neuroscience Letters*, 444(1), 36–41. <https://doi.org/10.1016/j.neulet.2008.08.011>
- Tolstoy, L. N. (1959). *What Is Art? And Essays on Art*. Oxford University Press.
- Tomasello, M. (2020). The moral psychology of obligation. *Behavioral and Brain Sciences*, 43(55), 1–58.
<https://doi.org/10.1017/S0140525X19001742>
- Tooby, J., & Cosmides, L. (2001). Does beauty build adapted minds? Toward an evolutionary theory of aesthetics, fiction and the arts. *SubStance*, 30(2), 6–27. <https://doi.org/10.2307/3685502>

- Trehub, S. E., & Nakata, T. (2001). Emotion and music in infancy. *Musicae Scientiae*, 5(1), 37–61.
<https://doi.org/10.1177/10298649020050S103>
- Trivedi, U., Alqasemi, R., & Dubey, R. (2016). Wearable musical haptic sleeves for people with hearing impairment. *Proceedings of the 12th ACM International Conference on Pervasive Technologies Related to Assistive Environments*, 146–151. <https://doi.org/10.1145/3316782.3316796>
- Tscherry, L. (2015, January 27). *Anne Frank: 10 beautiful quotes from The Diary of a Young Girl*. The Guardian. <http://www.theguardian.com/childrens-books-site/2015/jan/27/the-greatest-anne-frank-quotes-ever>
- Tse, A., Jennett, C., Moore, J., Watson, Z., Rigby, J., & Cox, A. L. (2017). Was I there? Impact of platform and headphones on 360 video immersion. *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '17*, 2967–2974.
<https://doi.org/10.1145/3027063.3053225>
- Tsetserukou, D., Neviarouskaya, A., Prendinger, H., Kawakami, N., & Tachi, S. (2009). Affective haptics in emotional communication. *2009 3rd International Conference on Affective Computing and Intelligent Interaction and Workshops*, 1–6. <https://doi.org/10.1109/ACII.2009.5349516>
- Turchet, L., & Barthet, M. (2019). Co-design of musical haptic wearables for electronic music performer's communication. *IEEE Transactions on Human-Machine Systems*, 49(2), 183–193.
<https://doi.org/10.1109/THMS.2018.2885408>
- Turchet, L., West, T., & Wanderley, M. M. (2020). Touching the audience: Musical haptic wearables for augmented and participatory live music performances. *Personal and Ubiquitous Computing*.
<https://doi.org/10.1007/s00779-020-01395-2>
- Urgo, J. R. (1985). Proletarian literature and feminism: The gastonia novels and feminist protest. *Minnesota Review*, 24, 64–84.

- Van Boven, L., Kane, J., McGraw, A. P., & Dale, J. (2010). Feeling close: Emotional intensity reduces perceived psychological distance. *Journal of Personality and Social Psychology*, 98(6), 872–885.
<https://doi.org/10.1037/a0019262>
- van der Tol, A. (2016). The appeal of sad music: A brief overview of current directions in research on motivations for listening to sad music. *The Arts in Psychotherapy*, 49, 44–49.
<https://doi.org/10.1016/j.aip.2016.05.008>
- Van Dongen, N. N. N., Van Strien, J. W., & Dijkstra, K. (2016). Implicit emotion regulation in the context of viewing artworks: ERP evidence in response to pleasant and unpleasant pictures. *Brain and Cognition*, 107, 48–54. <https://doi.org/10.1016/j.bandc.2016.06.003>
- Van Kerrebroeck, H., Brengman, M., & Willems, K. (2017a). Escaping the crowd: An experimental study on the impact of a Virtual Reality experience in a shopping mall. *Computers in Human Behavior*, 77, 437–450. <https://doi.org/10.1016/j.chb.2017.07.019>
- Van Kerrebroeck, H., Brengman, M., & Willems, K. (2017b). When brands come to life: Experimental research on the vividness effect of Virtual Reality in transformational marketing communications. *Virtual Reality*, 21(4), 177–191. <https://doi.org/10.1007/s10055-017-0306-3>
- Västfjäll, D. (2001). Emotion induction through music: A review of the musical mood induction procedure. *Musicae Scientiae*, 5(1), 173–211. <https://doi.org/10.1177/10298649020050S107>
- Venkatesan, T., Wang, Q. J., & Spence, C. (2020). Does the typeface on album cover influence expectations and perception of music? *Psychology of Aesthetics, Creativity, and the Arts*, Advance online copy. <https://doi.org/10.1037/aca0000330>
- Verrillo, R. T., & Gescheider, G. A. (1975). Enhancement and summation in the perception of two successive vibrotactile stimuli. *Perception & Psychophysics*, 18(2), 128–136.
<https://doi.org/10.3758/BF03204100>

- Vessel, E. A., Starr, G. G., & Rubin, N. (2012). The brain on art: Intense aesthetic experience activates the default mode network. *Frontiers in Human Neuroscience*, 6: 66.
<https://doi.org/10.3389/fnhum.2012.00066>
- Vi, C. T., Ablart, D., Gatti, E., Velasco, C., & Obrist, M. (2017). Not just seeing, but also feeling art: Mid-air haptic experiences integrated in a multisensory art exhibition. *International Journal of Human-Computer Studies*, 108, 1–14. <https://doi.org/10.1016/j.ijhcs.2017.06.004>
- Vogels, I. M. L. C. (2004). Detection of temporal delays in visual-haptic interfaces. *Human Factors*, 46(1), 118–134. <https://doi.org/10.1518/hfes.46.1.118.30394>
- Vorderer, P. (2001). It's all entertainment—Sure. But what exactly is entertainment? Communication research, media psychology, and the explanation of entertainment experiences. *Poetics*, 29(4), 247–261. [https://doi.org/10.1016/S0304-422X\(01\)00037-7](https://doi.org/10.1016/S0304-422X(01)00037-7)
- Vuoskoski, J. K., & Eerola, T. (2011). Measuring music-induced emotion: A comparison of emotion models, personality biases, and intensity of experiences. *Musicae Scientiae*, 15(2), 159–173.
<https://doi.org/10.1177/1029864911403367>
- Vuoskoski, J. K., & Eerola, T. (2017). The pleasure evoked by sad music is mediated by feelings of being moved. *Frontiers in Psychology*, 8: 439. <https://doi.org/10.3389/fpsyg.2017.00439>
- Vuoskoski, J. K., Thompson, W. F., McIlwain, D., & Eerola, T. (2012). Who enjoys listening to sad music and why? *Music Perception*, 29(3), 311–317. <https://doi.org/10.1525/mp.2012.29.3.311>
- Waddell, G., & Williamon, A. (2017). Eye of the beholder: Stage entrance behavior and facial expression affect continuous quality ratings in music performance. *Frontiers in Psychology*, 8: 513.
<https://doi.org/10.3389/fpsyg.2017.00513>
- Wagner, V., Klein, J., Hanich, J., Shah, M., Menninghaus, W., & Jacobsen, T. (2016). Anger framed: A field study on emotion, pleasure, and art. *Psychology of Aesthetics, Creativity, and the Arts*, 10(2), 134–146. <https://doi.org/10.1037/aca0000029>

- Wagner, V., Menninghaus, W., Hanich, J., & Jacobsen, T. (2014). Art schema effects on affective experience: The case of disgusting images. *Psychology of Aesthetics, Creativity, and the Arts*, 8(2), 120–129. <https://doi.org/10.1037/a0036126>
- Walkington, Z., Wigman, S. A., & Bowles, D. (2020). The impact of narratives and transportation on empathic responding. *Poetics*, 80, 101425. <https://doi.org/10.1016/j.poetic.2019.101425>
- Walther, J. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research*, 23(1), 3–43. <https://doi.org/10.1177/009365096023001001>
- Walther, J., Anderson, J., & Park, D. (1994). Interpersonal effects in computer-mediated interaction: A meta-analysis of social and antisocial communication. *Communication Research*, 21(4), 460–487. <https://doi.org/10.1177/009365094021004002>
- Walton, K. L. (1988). What is abstract about the art of music? *The Journal of Aesthetics and Art Criticism*, 46(3), 351–364.
- Weitz, M. (1956). The role of theory in aesthetics. *The Journal of Aesthetics and Art Criticism*, 15(1), 27–35. <https://doi.org/10.2307/427491>
- Wessling, K., Huber, J., & Netzer, O. (2017). MTurk character misrepresentation: Assessment and solutions. *Journal of Consumer Research*, 44(1), 211–230. <https://doi.org/10.1093/jcr/ucx053>
- West, K. (2013). *I Am a God*. Def Jam Records.
- Williams, G. P., & Kleinke, C. L. (1993). Effects of mutual gaze and touch on attraction, mood, and cardiovascular reactivity. *Journal of Research in Personality*, 27(2), 170–183. <https://doi.org/10.1006/jrpe.1993.1012>
- Williams, J. A., & Wilson, R. (2016). Music and crowdfunded websites: Digital patronage and artist-fan interactivity. In S. Whiteley & S. Rambarran (Eds.), *The Oxford Handbook of Music and Virtuality*. Oxford University Press.

- Wilson, E. C., Reed, C. M., & Braida, L. D. (2010). Integration of auditory and vibrotactile stimuli: Effects of frequency. *The Journal of the Acoustical Society of America*, 127(5), 3044–3059.
<https://doi.org/10.1121/1.3365318>
- Winston, A. S., Kenyon, B., Stewardson, J., & Lepine, T. (1995). Children's sensitivity to expression of emotion in drawings. *Visual Arts Research*, 21(1), 1–14.
- Wlömert, N., & Papies, D. (2016). On-demand streaming services and music industry revenues—Insights from Spotify's market entry. *International Journal of Research in Marketing*, 33(2), 314–327.
<https://doi.org/10.1016/j.ijresmar.2015.11.002>
- Wohlfeil, M., & Whelan, S. (2012). “Saved!” by Jena Malone: An introspective study of a consumer's fan relationship with a film actress. *Journal of Business Research*, 65(4), 511–519.
<https://doi.org/10.1016/j.jbusres.2011.02.030>
- Wöllner, C. (2012). Is empathy related to the perception of emotional expression in music? A multimodal time-series analysis. *Psychology of Aesthetics, Creativity, and the Arts*, 6(3), 214–223.
<https://doi.org/10.1037/a0027392>
- Young, G. W., Murphy, D., & Weeter, J. (2017). Haptics in music: The effects of vibrotactile stimulus in low frequency auditory difference detection tasks. *IEEE Transactions on Haptics*, 10(1), 135–139. <https://doi.org/10.1109/TOH.2016.2646370>
- Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of concern for others. *Developmental Psychology*, 28(1), 126–136. <https://doi.org/10.1037/0012-1649.28.1.126>
- Zaidel, D. W. (2010). Art and brain: Insights from neuropsychology, biology and evolution. *Journal of Anatomy*, 216(2), 177–183. <https://doi.org/10.1111/j.1469-7580.2009.01099.x>
- Zaidel, D. W. (2015). Neuroesthetics is not just about art. *Frontiers in Human Neuroscience*, 9: 80.
<https://doi.org/10.3389/fnhum.2015.00080>

- Zelechowska, A., Gonzalez-Sanchez, V. E., Laeng, B., & Jensenius, A. R. (2020). Headphones or speakers? An exploratory study of their effects on spontaneous body movement to rhythmic music. *Frontiers in Psychology, 11*: 698. <https://doi.org/10.3389/fpsyg.2020.00698>
- Zhou, H., & Fishbach, A. (2016). The pitfall of experimenting on the web: How unattended selective attrition leads to surprising (yet false) research conclusions. *Journal of Personality and Social Psychology, 111*(4), 493–504. <https://doi.org/10.1037/pspa0000056>
- Zwaan, R. A. (1991). Some parameters of literary and news comprehension. *Poetics, 20*(2), 139–156. [https://doi.org/10.1016/0304-422X\(91\)90003-8](https://doi.org/10.1016/0304-422X(91)90003-8)

APPENDIX A

This section lists the exploratory items and attention checks included in the surveys for both the Headphones Study (Chapter 2) and the Haptics Study (Chapter 3).

Exploratory Items in Headphones and Haptics Studies (Chapters 2 & 3):

The following items were collected in both the headphones and haptics studies for future exploratory analyses. These measures were excluded from the main analysis as they were not important to the central hypotheses.

- i.) *Affect and arousal.* Participants were also asked to indicate how they were feeling as a result of listening to the music on 8-point bipolar scales
 - a. unhappy/happy
 - b. calm/excited
 - c. relaxed/stimulated
 - d. annoyed/pleased
 - e. tired/full of energy
 - f. unsatisfied/satisfied
 - g. not in the mood to listen/in the mood to listen
 - h. hate listening/enjoy listening
- ii.) *Emotional intensity.* Participants answered a single question about the emotional intensity of the experience (“How strongly did you feel about the emotions in this song?”). They answered on a 7-point Likert scale ranging from no emotions experienced to very strong emotions experienced.
- iii.) *Desire to see singer live.* Participants were also asked a single measure questions about how interested they would be to see this singer perform live. They answered on 7-point scale ranging from *not at all* to *very much so*.
- iv.) *Learning more about the artist.* Participants were asked a forced choice (yes/no) question about whether they wanted to learn more about the singer or not. If they answered “yes”, they were shown a short description about the artist that they just heard.
- v.) *Psychological distance* was a scale taken from Han et al., 2018. The scale ranged from 1 = the musician feels very close to 9 = the musician feels very far away.

Attention Checks for Headphones and Haptics Studies (Chapters 2 & 3):

The following two attention checks were embedded in the headphones and haptics studies. The exclusion criteria were an average score lower than 4 on Attention Check #1 and failing to click “strongly agree” on Attention Check #2.

- i.) *Attention Check #1.* Participants were asked to rate how they felt at the moment of taking the Qualtrics survey. Participants ranked how they felt on the following items on a 7-point scale ranging from *not at all* to *very much so*.

- a. Attentive
- b. Accurate
- c. Alert
- d. Focused

ii.) *Attention Check #2.* A question was embedded in the block of questions about cognitive empathy. Participants were asked to “Click ‘strongly agree’ if you are reading this statement”.

APPENDIX B

This section shows all the four text stimuli presented to participants for the four art/not-art vignette pairs.

1. Short Story/Blog Post (taken from Bertram, 2015).

"Sometimes I wonder if I will ever be finished with weeping. It's possible that when Jeff died, the pain dug such a deep well into my psyche, it tapped into an everlasting underground river of tears, and so they will be with me on and off for the rest of my life.

I never expect the grief upsurges. After each one, I think I'm done with the tears, but apparently, the well is deeper than I ever imagined.

I lost Jeff the other day. Literally lost him as in- could not find him. Or rather, could not find his ashes. When I first got the ashes from the funeral home, I wrapped his robe around them to keep him warm. (Yeah, I know — he couldn't feel the cold, but such is the magical thinking of grief.) And when I got here, I set the bundle on the couch in my living room, and there it stayed until a week or so ago. I had to clear things out of that room so it could be cleaned, and I placed the bundle in a box in the garage with my packed things, and somehow, I moved the box without remembering what was in it."

2. Song Lyrics/Tweet (Lee, Moody, & Hodges, 2003):

"I'm so tired of being here. I wish that you would just leave because your presence still lingers here and it won't leave me alone. I try and try but these wounds won't seem to heal. This pain is just too real. There's just too much that time cannot erase."

3. Monologue/Diary Entry (taken from Plath, 1962/2000, Letter 31):

"Tonight I am ugly. I have lost all faith in my ability to attract males. And in the female animal that is a rather pathetic malady. My social contact is at the lowest ebb. Bill,¹¹ my one link with Saturday night life, is gone, and I have no one left. No one at all. I don't care about anyone, and the feeling is quite obviously mutual. What is it that makes one attract others? Last year I had several boys who wanted me for various reasons. I was sure of my looks, sure of my magnetism, and my ego was satiated. Now, after my three blind dates — two of which flopped utterly and completely, the third has also deflated. I wonder how I ever thought I was desirable. Someone, somewhere, can you understand me a little, love me a little? For all my despair, for all my ideals, for all that — I love life. But it is hard, and I have so much — so very much to learn —

Now I'm going to be more ambitious: this week I won't share my worry about visiting with Ted, Nor my worries in general. work. Confiding in him is my worst weakness. I feel he deserves to bear my pain and share it, but I must shoulder my aloneness somehow."

4. Movie Script/Dialogue Transcript (Platt, 2007):

"Police: Our shrink thinks Janis was abused as a child. Any truth to that?

Me: I don't know. She left home when she was sixteen. I was only six.

Police: Were you abused?

Me: Yeah

Police: You ever tell Janis?

Me: Why would I? She didn't care. She didn't stick around to protect me.

Police: What did your dad do to you?

Me: The night Janis ran away, he dragged me through the house by my hairs, demanding to know where she went. I didn't know, but he didn't believe me. Made me drink hot sauce till I threw up.

Police: Where was your mother?

Me: In the room. Watching. She was always there. Never said a word. I begged her to help me, but she didn't. No one did...I'm sorry I feel sick just thinking about this. Can we stop now?"