THE PHENOMENOLOGY OF FLOW IN YOUNG PIANO LEARNERS

AND VIDEO GAMERS

by

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ABSTRACT

The researcher used phenomenological inquiry to compare and contrast experiences of flow in young piano learners as they practiced the piano and played video games. While not all participants experienced flow, they had more flow-like experiences in video gaming than in piano practice. Video game experience included mortal danger and death, as the technology forced them to pause and repeat actions that had led to mistakes. They saw piano practice more as work than play and did not expect to experience flow in practice. They experienced limitlessness in video gaming as the technology guided them from one challenge to the next; piano music on the page was finite and static by comparison. Digital tools to aid music students in home practice should position piano practice as work rather than play but could include game-like elements such as: mortal danger by not tolerating mistakes; and limitlessness by doling out challenges sequentially.
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Chapter 1: Introduction

As a private music educator, it is my experience that my colleagues and I are responding to new digital technologies with both great enthusiasm and great concern. The enthusiasm comes with the affordances of digital technology in expanding the range of input into our students’ musical education. YouTube recordings of accomplished musicians, mobile game apps that teach musical concepts, and a metronome on every phone can all enhance learning. The concern comes as this same digital technology has created an enticing video game-world that for many students has become more compelling than practicing the piano to become an expert musician. Piano teachers like me, who grew up using the piano as a refuge from the troubles of daily life, watch in dismay as our students struggle to find time to practice. Often they quit piano altogether, choosing technologies other than ivory and strings as their escape from stress. Beyond escape, deep involvement in one’s chosen activity can lead to experiences of flow, which is a strong motivator to continue. While research has found that both video gaming and playing the piano can produce flow experiences, less is known about how the two experiences might be similar or different. In this master’s research I investigate the experiences of flow in young music learners as they practice the piano and as they play video games.

The Research Question

My research question is: How do young piano students experience flow in their individual music practice and how does it compare to their experience of flow in video gaming? Flow is a feeling of total immersion, creativity, and involvement where both
high skill and high challenge are present (Csikszentmihalyi, 1990). Individual music practice is taken here to mean the solitary act of sitting at the piano and learning to play particular pieces of music. Piano practice can also include developing technical skills by playing composed technical exercises as well as scales, chords, and arpeggios. Video gaming means the act of sitting in front of a computer, gaming console, or handheld device and playing a game that has been programmed for entertainment. Video gaming in the context of this research is usually done when the player is alone or nearly alone in a room, although the player may be playing with, against, or alongside other players, either real people or programmed creations, via the Internet. While the range of video game types is broad, the video games in this research involve intense visual experiences that transport the player to a virtual world with its own set of rules and actions.

**Context of the Research**

As a professional pianist, I know well the exhilaration of engaging my best musical self in performing challenging music that uses all my perceptual, motor, cognitive, and emotional skills. Another name for this feeling is flow. Through a variety of relationships and personal experiences, I know enough about video game play to know that this same feeling of peak experience can happen when a skilled player engages with a challenging game. Video games are carefully designed to elicit this feeling. I want to know what are the common elements in these two experiences — playing the piano and playing video games. My reason for wanting to know is pedagogical.

As a piano teacher, I am always looking for ways to motivate my students to engage their perceptual, motor, cognitive, and emotional selves to create beautiful music
that brings them satisfaction. I know that they can also access these feelings by playing video games. Video game play involves activities that are similar to piano learning: repeating small actions again and again for mastery, control, and precision; amassing arcane knowledge to guide strategic choices; and taking incremental actions that build toward a larger goal. I want to know how video games hook players so I can use that knowledge to create similar hooks for piano learners.

As an economist, I am interested in maximizing the competitive advantage of human beings in the face of digital replacements for many of the activities we currently perform. “Musical performance is very likely the domain in which humans produce the most intricate, complex integration of expert perceptual, motor, cognitive, and emotive skills” (Parsons, Sergent, Hodges, & Fox, 2005, p. 199). As the “pinnacle of human central nervous system performance (and what space aliens most covet)” (p. 199), playing the piano is a human activity worth preserving and cultivating. In an effort not to allow the discipline required to cultivate piano skills to be crowded out by time spent video gaming, which employs similar skills and rewards, it is worth considering ways to blend the two. The aim of my research is to inform my future work in using mobile technology to motivate learners to persevere in acquiring acoustic piano skills.

**Brief History of the Researcher**

I am a lifelong pianist who trained in classical piano performance under the Royal Conservatory of Music system until I finished high school. I have performed and taught piano nearly continuously since my formal study ended. My professional musical involvements have included ballet accompaniment, collaborative piano with solo
vocalists, choirs, and instrumentalists (strings, winds, and percussion), musical theatre accompaniment and musical direction, church music, and performances at weddings and other events. I also play the clarinet in the Fredericton Symphony Orchestra.

My undergraduate study was an honours Bachelor of Arts degree in Economics at the University of Alberta. I am thoroughly familiar with quantitative methods and multiple regression analysis. Many years after completing that degree and serving as a research assistant to several economists, I still think like an economist. This means I am highly attuned to the difference between correlation and causation and I am always looking for alternative explanations for phenomena whose causes appear to be obvious. A common point of interest between economists and teachers of any kind is the use of incentives to motivate behaviour. I am keenly aware of the ways in which financial, emotional, and other incentives operate on human behaviour. However, like behavioural economists, I understand that people are not strictly rational beings. Rather, they are motivated by a cocktail of influences whose secrets social scientists are just beginning to glimpse. Flow is one of those ingredients.

I have been teaching piano more intensively and participating in professional development and local professional organizations for piano teachers over the past ten years. This has stimulated in me a deeper pedagogical orientation to integrate students’ current skills and past experiences into a pedagogy that motivates them to develop perceptual, motor, cognitive, and emotional disciplines that will incrementally shape them into confident musicians and in turn into human beings with broad skills in self-control, problem-solving, and perseverance. This is not to say that the ability to create emotionally engaging music is not a sufficient end of musical instruction. However, the
spinoff benefits of increased self-control, problem-solving ability, and perseverance are broad and life-long across all disciplines of endeavour. I want to do everything I can to stimulate my students to achieve flow in their individual music practice in order to increase these skills.

Besides selling my musical skills to others, I have also employed them in my own family. I have guided my two daughters through many years of music lessons in piano, violin, cello, flute, and voice. Both daughters are accomplished musicians who are familiar with the flow experience. We have rehearsed and performed together countless times in amateur and professional contexts. Although it is only in the last couple of years that I have become aware of Csikszentmihalyi’s (1975) concept of flow, it is as though I have been operating an informal flow laboratory for many years.

Being the spouse of a qualitative researcher in mathematics education is a significant part of my personal context. My husband has chosen qualitative research methods not because he is incapable of wicked-hard mathematics but because he is committed to paying deep attention to language and positioning in pedagogical relationships. Coming from a background in heavily quantitative economics research, my conversion to qualitative methods has been slow. This research is my earnest attempt at trying something new to see where it might lead.

**Thesis Outline**

In Chapter 2 I discuss my extensive review of the literature on flow generally as well as flow in piano practice and video gaming. Chapter 3 comprises my methods and methodology; I describe how I recruited participants, gathered the data, and performed
the analysis. In Chapters 4, 5, and 6 I present my findings. Each of these three chapters begins with parallel phenomenological accounts that focus on a particular aspect of video game play and piano practice, laying them alongside one another so that similarities and differences are easy to see. The next parts of these chapters discuss in more detail the lived experiences of the participants, sometimes drawing in other sources, including my own experiences, to flesh out the themes in the data. In Chapter 7 I present the phenomenological findings and themes as responses to the many questions that emerged from my review of the literature to see where they agree, where they diverge, and what is new. Chapter 8 reveals my pedagogical insights and presents ideas about moving forward in researching the phenomenon of flow in the context of private music education.
Chapter 2: Review of the Literature

The research question guiding my exploration of the literature was: How do young piano students experience flow in their individual music practice and how does it compare to their experience of flow in video gaming? I did not find any literature that compares these two experiences directly. I broke up the question and explored the literature on the flow experience in three different ways: 1) literature on flow in general — what it is, how it is measured, and current trends in flow research, 2) literature on flow in music-making, and 3) literature on flow in video gaming.

I searched online databases and combed through lists of references in articles about flow to make connections to underlying phenomena and ways of investigating the flow experience. Search terms chiefly included flow, music, and variants on video games and gaming. It is fortunate that the chief progenitor of flow research has such a distinctive name; including Csikszentmihalyi as a search term narrows the results. I targeted research that investigates the flow experiences of children and youth. Although my focus is on piano learners, I explored literature on flow in music-making in general because there has been very little work on flow specifically with pianists.

In this review of the literature, I have chosen to deal separately with research on the autotelic personality, focusing on the concept of effortless attention as a way to explain autotelic experience. In doing phenomenological research I was interested in how the personal characteristics of my participants related to their experience as musicians and gamers. It was important for me to know the research on how personality might enable or inhibit flow experience.
There is a body of literature on the experience of flow in sport. Despite the fact that music making is a fully embodied experience, I left aside the studies on sport because the level of physical intensity in music making is quite different. Instead, I chose to explore embodied cognition as a way to connect body to flow in music making and video gaming.

**Flow in General**

I begin this tour of the literature with flow research in general. I discuss how flow came to be studied, what flow is, how it has been measured, and current trends in flow research.

**Origins of flow research.** Research on flow began in the 1970s. It grew out of a new movement in psychology research called Positive Psychology. Rather than investigating psychological pathologies and sub-optimal states, researchers like Csikszentmihalyi (1975) and Rheinberg (1982) chose instead to explore the conditions that lead to fulfilling lives. While positive affect (happiness) has been found often to be correlated with flow experiences, not enough research has been done to determine whether flow makes people happy or whether people who are already happy experience more flow (Landhäußer & Keller, 2012). Engeser and Schiepe-Tiska (2012) noted that flow is NOT the experience of happiness. A person in flow does not reflect on whether or not he or she is happy.

In the United States Csikszentmihalyi began by interviewing people who devoted great amounts of time and energy to activities in which they received no external reward, such as rock climbing or playing chess. By accumulating and comparing people’s stories of flow activities, he identified common elements in what he in 1990 termed *optimal*
experience. He marveled at the way people could choose to control and organize their consciousness so that they were completely absorbed in an activity, oblivious to the external realities and even to the passage of time: “the opposite state from the condition of psychic entropy is optimal experience” (Csikszentmihalyi, 1990, p. 39). He called this optimal experience flow.

In parallel research in Germany, Rheinberg in the 1970s tried to create a model to explain students’ preparation for exams, capturing all relevant aspects of their motivation. The model failed to make accurate predictions because it focused on extrinsically rewarding activities. This led Rheinberg to start asking why people engage in activities with no obvious external reward. When he started to consider task-related incentives (as opposed to purpose-related incentives), his model gained a lot of predictive power (Engeser & Schiepe-Tiska, 2012).

What is flow? “Flow is a state in which an individual is completely immersed in an activity without reflective self-consciousness but with a deep sense of control” (Engeser & Schiepe-Tiska, 2012, p. 1).

The definition of flow has remained relatively stable since Csikszentmihalyi first developed it. Flow has eight main components, all of which must appear together in order for an experience to be flow. Researchers over the years have tweaked the names of these components but I present them here as Csikszentmihalyi laid them out in his popular book titled Flow: The Psychology of Optimal Experience (1990).
1) A Challenging Activity that Requires Skill

There is a balance between the demands of the activity and the person’s ability to meet those demands.

2) The Merging of Action and Awareness

The activity becomes a purpose in itself; the person doing it does not reflect on his or her actions but is carried forward “as if by magic” (p. 54).

3) Clear Goals and Feedback

The goals can be a built-in component of the activity (e.g., reaching the top of the mountain) or the person can set his or her own internal goals (e.g., arriving at that tree over there). It is immediately obvious whether or not the person has reached each goal.

4) Concentration on the Task at Hand

The mind is completely absorbed in the task at hand; there is no room to focus on anything external to the task.

5) The Paradox of Control

The thrill of flow usually comes in activities where failure is a real possibility but where the person feels largely in control of the outcome. For example, surgeons may experience flow as they apply all their skill in an operation that may or may not succeed.

6) The Loss of Self-Consciousness

A person in flow loses a sense of the self and is not able to be self-critical in the moment. The person feels united with the activity. For example, a musician may not feel a difference between the self and the music.
7) The Transformation of Time

The person in flow loses the usual sense of the passage of time. Time may seem to speed up or slow down.

8) Autotelic Experience

This is the key element of optimal experience: the experience is an end in itself. *Auto* means self and *telos* means goal. An activity that produces flow is something the person would do even if he or she did not have to.

This last element — the autotelic personality — is both fascinating and problematic. It is interesting to study people with autotelic personalities because of the desire to know what motivates them to do things no one is asking them to do. But Engeser and Schiepe-Tiska (2012) noted that there is a danger of circular explanation if we say that intrinsically motivated behaviour defines flow. They argued that flow can also be experienced in activities that have extrinsic rewards. Think of a person who makes an otherwise boring workday more interesting by setting and achieving small personal goals throughout the day or of a professional musician who gives a great performance while in a state of flow. I explore the autotelic experience more fully in the penultimate section of this literature review.

**Measuring flow.** I want to spend some time explaining how flow has been measured with the aim of demonstrating that it is complicated and that various and sustained efforts have yet to yield a satisfactory accounting of the phenomenon. This overview of attempts to measure flow will reveal the normal practices psychology
researchers use to investigate flow with research participants. I borrowed some of their techniques and language to discuss flow with the participants in my investigation.

It is not usually possible to tell just by observing a person whether or not he or she is experiencing flow. You have to ask. The problem with asking people to tell about their flow while it is happening is that stopping to answer the question interrupts the flow experience. Csikszentmihalyi and his colleagues found a couple of ways around this.

Csikszentmihalyi’s original interviews with people who experienced flow led him to develop a Flow Questionnaire (FQ), which he used to determine whether or not a respondent had actually experienced flow (Moneta, 2012). In the first part of the FQ, he asked the respondent to read three quotations that described a flow experience. He then asked, “Have you ever felt similar experiences?” and “If yes, what activities were you engaged in when you had such experiences?” (as quoted in Moneta, 2012, p. 25). This approach had two main strengths. First, it did not assume that everyone experiences flow. Second, the range of activities in which flow could be experienced was wide open. The questionnaire went on to ask for more specifics about the flow activity identified by the respondent and to ask the respondent to identify a range of feelings that might accompany the activity and to rate expressions that might describe it (these came from Csikszentmihalyi’s original interviews).

Once he had determined that people experienced flow in a wide variety of activities, Csikszentmihalyi and his colleagues wanted to study people as they engaged in these activities. It is almost impossible to create the conditions for a flow experience in a controlled environment like a laboratory. This meant that they had to study people in their natural environments. To do this, Csikszentmihalyi, Larson, and Prescott (1977)
developed the Experience Sampling Method (ESM). Respondents in an ESM study receive beeps from a pager at random times throughout their day. At each beep, they have the option to stop what they are doing and fill out a questionnaire about their experience. The idea is that if they answer right after doing an activity, they are more likely to remember accurately how they felt and less likely to try to analyze it before responding. Respondents have the option of answering later or not answering at all for any particular beep. This might have a serious impact on results of these studies, particularly if the times people are least likely to notice the beep and to answer are when they are deep in flow. However, the researchers asserted that by aggregating a large number of experiences they could capture flow experiences as well as times of non-flow (Engeser & Schiepe-Tiska, 2012).

The ESM questionnaire starts with general questions about what time it is, what the person is doing, whether or not the activity is voluntary, and how interesting it is. It goes on to ask respondents to rate a variety of aspects of their experience on 29 different scales. The first set of 16 scales deals with things like level of concentration, self-consciousness, feelings of control, physical discomfort, challenges, skills, the importance of the activity to self and to others, and satisfaction. The second set comprises 13 Likert scales measuring how alert, happy, cheerful, strong, active, sociable, proud, involved, excited, open, clear, relaxed, and positive the respondent feels. Flow researchers have made rigorous use of statistical techniques to assure their readers that their ESM measurements are useful even though different people might rate their experience and feelings differently (e.g., one person might freely rate some aspects at the top or bottom of the scale, while another person might never choose the extremes) (Moneta, 2012).
The findings from the ESM research have resulted in numerous models that take the total range of possible experiences — from total boredom and apathy to extreme anxiety and feeling overwhelmed — and locate the sweet spot where challenge and skill are both high and perfectly balanced (see Figure 1). This sweet spot is where flow occurs. Note that a simple balance between challenge and skill is not enough to produce flow; both must be at the upper range of what the individual normally experiences. This means that an activity that challenges one person to operate at the edge of his or her zone of proximal development might be totally boring for another person who has higher skill and requires greater challenge. “Flow fosters the engagement in challenging activities, and in order to maintain flow, a person has to set higher standards as skills progress” (Engeser & Schiepe-Tiska, 2012, p. 6).

Flow researchers have devised numerous 2D and 3D graphical representations of how the balance between challenges and skills relates to flow. Below is one example from Csikszentmihalyi and Nakamura (2002):
Jackson and Eklund (2002, 2004) found that the ESM methods were not psychometrically sound and developed new scales that measured flow both as a state and as a trait. Their work took place mainly in a sports context, where they discuss trade-offs between the various components of flow. There has also been work on componential models using confirmatory factor analysis (CFA) to model flow either as a state where nine factors interact or as a single state. While these models are comprehensive and psychometrically valid, like ESM they impose flow on the respondents, they ignore the differences between antecedents and indicators of flow, and they cannot account for the difference between being in flow (a positive state) and being hyper-aware because of an imminent threat (Moneta, 2012). The bottom line is that despite wide agreement about what flow feels like and when it happens, researchers have had limited success in teasing out exactly what is happening in the brain and the body when flow occurs. Is it a single
emergent sensation resulting from a combination of factors or is it simply a constellation of concurrent experiential events?

Despite the variety of experiences interrogated with ESM, the great wish of flow researchers has been to induce and measure flow in a laboratory. Few have attempted this. De Manzano, Theorell, Harmat, and Ullén (2010) hooked professional pianists up to physiological measurement instruments and took readings while the pianists played favourite music of their own choosing. They found that pianists in flow had a decreased heart period and larger respiratory depth than when they were not playing. They also smiled more. One study is clearly insufficient to conclude that these physiological changes are true of everyone in flow in any activity.

The other context in which researchers induced flow in a controlled setting was video game play. Keller and Bless (2008) had people play Tetris while the researchers manipulated the fit between skills and challenges to see if they could find the sweet spot where the two were balanced and high. They did induce enjoyment in the players but there is some question as to whether the skills and challenges in this simple game were indeed above average for the players involved (Keller & Ländhaußer, 2012).

Although I did not try to induce flow in my respondents in a laboratory setting, it is encouraging to know that the two activities I interrogated — playing the piano and playing video games — are so very amenable to flow experiences that they can even be studied in controlled settings. This gave me confidence in assuming that the participants in my investigation would be fairly likely to have experienced flow in one or both of these activities.
Current trends in flow research. Even though the accepted definition of flow includes the eight aspects identified by Csikszentmihalyi, many researchers have latched onto the simplicity of focusing on challenge-skill balance as a chief indicator of the presence of flow. It is important to note that this is true mainly in activities that are undertaken voluntarily. Abuhamdeh (2012) noted that when there is a lot at stake in completing a performance task that has an extrinsic reward people usually prefer low challenge and high skill.

Beyond challenge-skill balance, Moneta (2012) has looked at the research and identified three important conditions for flow to occur:

1) A reduced level of self-consciousness: For example, performing in front of a mirror or in another situation that increases self-consciousness is likely to inhibit flow. People with a strong fear of failure are more self-conscious.

2) A strong sense of control: People who feel a lack of autonomy experience less flow.

3) Intensely focused concentration: Physiological aspects like mental load, exhaustion, fatigue, and self-regulatory resource depletion all inhibit flow.

A number of different areas of research into flow have emerged from the wide variety of flow-inducing activities identified in the original research. Because flow can be a predictor of high performance, researchers in sports (e.g., Jackson & Eklund, 2002) and learning in educational settings (e.g., Custodero, 2012) have become interested in flow. Because flow can influence consumer behaviour, another area for flow research includes human-computer interaction (HCI), game-based learning, and media use (e.g., Nah, Eschenbrenner, Zeng, Telaprolu, & Sepehr, 2014). There is research into how working
conditions and people’s experience in therapeutic settings can be improved with flow (Engeser & Schiepe-Tiska, 2012). Music, religious experiences, and the arts are another focus of flow research (e.g., Bernard, 2009). There is research on personality aspects of flow as well as a growing interest in flow in social contexts (Engeser & Schiepe-Tiska, 2012). Finally, there is the single pianist study by de Manzano et al. (2010) on the physiological correlates of flow.

**Flow in Music Making**

Music making is for many people a source of optimal experience. Playing an instrument or singing requires physical, intellectual, and emotional coordination that is more challenging than most people’s usual daily activities. Csikszentmihalyi (1990) discussed music and flow at length, noting that the ordering of sounds in music production mirrors the ordering of consciousness. Music performers have historically reported achieving flow (Bernard, 2009).

In reviewing the literature on flow in music making, I focus on music as an individual experience, I explore some research on performance anxiety that informed my methodology decisions, and I examine studies that investigated music flow in children and in adolescents.

**Individual experience.** Studies of flow during music making have generally examined flow as an individual experience. Although flow can be easier to achieve when making music in a group setting (see, for example, Freer, 2009), Sawyer (2006) noted that Csikszentmihalyi’s original intent was to examine flow in individuals. Although Sawyer found group flow to be an emergent property, group flow is distinct from
individual flow. As my investigation examined flow in individuals as they practiced the piano and played video games, I chose to focus on research that looks at flow in individual musicians rather than in group music making.

Smolej Fritz and Avsec (2007) wanted to know whether music students who regularly experienced flow in their individual music practice would have a greater sense of subjective well-being. It turns out they did, but the well-being they reported using questionnaire instruments like Jackson and Eklund’s (2002, 2004) was higher in emotional than in cognitive aspects. While students might not express a cognitive judgment that they felt good, their self-reported flow showed the presence of positive emotional experiences. Smolej Fritz and Avsec supposed this was because music making is a strongly emotional experience. Their study confirmed that challenge-skill balance is central to achieving flow in music making. They also found that having clear goals and an autotelic personality are strongly correlated with flow experience. They noted that their study located correlation rather than causation, which again leads us in this circle where we have to ask whether there are just certain autotelic people who experience flow no matter what they are doing so that the activity itself is not the important component. Perhaps practicing music regularly only produces flow and well-being in those who are already inclined to find flow in whatever they do. I discuss the autotelic personality in a later section in this literature review.

Lori Custodero (2005, 2012) studied children’s flow experience during music activities. In her 2012 study she was particularly concerned about children’s imitative behaviour during music making. She noticed that students imitated each other more than they imitated the teacher and that the relationship between imitation and flow formed a
U-shaped curve. Imitation was high and flow was low both at the beginning, when students were learning a new musical activity, and at the end, when they had mastered it and were looking for new ideas. Imitation was low and flow was high in the middle of the activity as students enjoyed their mastery. Custodero worried about the extent to which imitation in educational music settings might prevent students from experiencing flow.

Does finding flow in music-making depend on a child’s family and cultural background? This is what Valenzuela and Codina (2014) investigated among 11- and 12-year-old music students in Spain by administering a questionnaire. They found that children from families where music making is a normal activity found it easier to achieve flow during their musical activities.

**Flow in performance.** Several studies on flow in music making have aimed to understand performance experiences (e.g., Wrigley & Emmerson, 2013) and performance anxiety (e.g., Kirchner, Bloom, & Skutnick-Henley, 2008). I chose not to review these in depth because the music making context I investigated is the one that most closely parallels the context of video game play — voluntary and solitary. Wrigley and Emmerson (2013) did not find that students’ flow experience in live music performance was significantly different from other flow experiences (e.g., sport). They also found no differences according to instrument type, level, or gender.

Fullager, Knight, and Sovern (2013) sought to test the relationship between challenge/skill balance and flow during weekly practice sessions of university music students. Like researchers in other domains of activity, they used a questionnaire adapted from Jackson and Eklund’s sports studies of flow to find out about the musicians’ flow
experience. The study confirmed that for flow to occur, challenge and skill need to be both balanced and high. They were also interested in performance anxiety, supposing that “understanding the processes that generate the flow state provides both a theoretical and practical framework for reducing performance anxiety” (Fullager, Knight, & Sovern, 2013, p. 255). It is interesting to note that they took as their starting point the laboratory studies of video game play (Engeser & Rheinberg, 2008; Keller & Bless, 2008; Keller & Blomann, 2008), adapting them to examine challenge/skill balance in music practice.

I have already mentioned the work by de Manzano et al. (2010) to examine physiological aspects of pianists’ flow experience in the laboratory. It is fascinating that professionals were able to enter into flow in performance in a controlled setting. This work must be considered an outlier in research on flow in music making; as a professional pianist and educator of young musicians I know firsthand the myriad personal and technical obstacles to entering flow both on demand and while being closely observed.

**Observing children’s music making.** The majority of flow research using interviews and questionnaires has been conducted with adolescent and adult participants (e.g., Csikszentmihalyi, Larson, & Prescott, 1977; Csikszentmihalyi, 1990). This approach does not work with young children. Lori Custodero (2005, 2012) studied flow in young music learners chiefly through observation, which is a very different approach than that of distributing questionnaires to adults. She framed children’s flow in this way: “Engagement in tasks whose challenges invite a person’s best efforts generates flow” (Custodero, 2012, p. 370). Using Csikszentmihalyi’s Experience Sampling Method
(ESM) as a guide, Custodero observed children engaged in music making, looking for examples of when they were feeling highly skilled and highly challenged. She coded their videotaped experiences using her Flow Indicators in Musical Activity (FIMA) form (Custodero, 2005). Three aspects of children’s engagement with materials of music during flow emerged as salient: 1) Anticipation (knowing what comes next in the music), 2) Expansion (a “what if?” attitude), and 3) Extension (students carried on with the musical activity outside the instructional context).

In her 2005 study observing pre-school and school-aged children in musical activities, Custodero noted that as children aged there was a decrease in both self-assignment and self-correction. This means “as children become more responsive to expectations of others, they may be more cognizant of adapting their behaviour to achieve those expectations” (Custodero, 2005, p. 203). This was a huge concern for me as I engaged with adolescent participants in discussing flow in their music making. As Custodero suggested, their music making might turn out to largely be focused on meeting other people’s expectations rather than their own.

Here I find a link to Cognitive Evaluation Theory (CET), which is a subtheory within self-determination theory (Deci & Ryan, 1985). Its aim is to explain intrinsic motivation using the concept of perceived competence, which is parallel to the idea of optimal challenge found in flow theory. To explain why people enjoy certain activities, CET hypothesizes that these activities satisfy our needs for competence and autonomy. CET has one big question for flow theorists: Why is autonomy missing from flow theory? Like Custodero, Deci and Ryan (1985) observed children in flow: “When children are working with optimally challenging activities, perceived competence will tend to come
naturally, for they will be having the experiences of success following concerted effort that lead to the perceptions of competence” (cited in Abuhamdeh, 2012, p. 117).

**Adolescents’ flow in music making.** In contrast to the questionnaire-based studies of flow in adults and adolescents (e.g., Csikszentmihalyi, Larson, & Prescott, 1977; Csikszentmihalyi, 1990) and the observation-based studies of children (Custodero, 2005, 2012) stands Garces-Bacsal, Cohen, and Tan’s (2011) study of flow experiences in 14 adolescent artistically talented students of dance, visual art, music, and theatre in Singapore. They used qualitative methodology, conducting semi-structured individual interviews that began with the question, “How do you feel whenever you engage in your art form?” (p. 198). They coded the interviews and found the themes that emerged paralleled most of Csikszentmihalyi’s characteristics of flow: enjoyment, challenging activity requiring skills, clear goals and feedback, loss of self-consciousness, transformation of time, and intense concentration.

O’Neill (1999) investigated adolescent music students’ flow experience during practice sessions using ESM questionnaires. She wanted to know why some students are motivated to spend hours practicing an instrument while others are not. She compared flow in three groups of students in North England: high achievers at a specialist music school, moderate achievers at a specialist music school, and young musicians from a non-specialist state school. Students reported more flow experiences during music making than during non-musical activities. Also, high achievers in the specialist school and musicians in the non-specialist school reported more flow experience than the moderate achievers at the specialist school. O’Neill also conducted interviews with participants and
discovered that the extrinsic rewards of the competitive environment in the specialist school might inhibit flow experiences in moderate achievers.

**Flow in Video Game Play**

Flow is the holy grail of video game design. In a conceptual paper built on the work of Holt (2000), Chen (2007) described video game play as a flow experience:

“Descriptions of the Flow experience are identical to what players experience when immersed in games, losing track of time and external pressure … Gamers value video games based on whether or not they provide a Flow experience” (p. 32). Chen conceived of flow in video games exactly as Csikszentmihalyi (1990) and those who followed him described it — a state where challenge and skill are both balanced and high. He investigated ways for video game designers to balance challenge dynamically against a player’s skill to keep the player in the flow state. Chen noted that various video game types can induce flow and that “no two people experience flow in the same way” (Chen, 2007, p. 33). To begin game play by providing the player with a vast array of choices to balance skills and challenges is not conducive to flow. Instead, Chen advocated creating game environments where players organically make adaptive choices as they engage in the core activities of the game.

In this section on flow in gaming, I explore some general themes in gaming flow research, from which the theme of gender emerges. I also point to literature on immersion because it is important for me to understand how immersion is similar to yet distinct from flow.
**Themes in video gaming flow research.** For a recent overview of the work on flow in gaming, I reached out to Fiona Nah, who with Eschenbrenner, Zeng, Telaprolu, and Sepehr in 2014 published a synthesis of the 39 articles with *flow* and some variant of the word *game* in the title. From the 35 experimental studies they reviewed, nine themes emerged:

1) Gaming in learning and education
2) Presence
3) Adoption
4) Addiction
5) Neural correlates of flow
6) Measurement of flow
7) E-marketing
8) Interactivity
9) Nomological network for flow (p. 94)

I picked out a few findings that seemed relevant to my research into flow experiences at the piano and in video game play.

**Presence.** Jin (2011) found that three kinds of presence influence flow: spatial presence (the feeling of being in a virtual environment), physical presence (when virtual objects feel real), and self-presence (when the virtual self is associated with one’s real self).

**Adoption.** Studies that looked at the theme of adoption found that a player who experiences flow is more likely to return to a game (Chang, 2013; Hsu & Lu, 2004; Jin,
Another finding is that social factors affect a player’s intention to return to a game (Zhou, 2013; Hsu & Lu, 2004).

Addiction. The findings on flow in video game play and addiction are mixed in the review presented by Nah et al. (2014). Some studies found correlation between flow and addiction, while others found that those who experience flow are less likely to become addicts. A conceptual paper by Sepehr and Head (2012) hypothesized that players who feel like they have personal autonomy may experience harmonious passion in an activity, while players who feel a lack of control over their lives may turn to obsessive passion in the same activity. Thus they supposed that it is the social environment that largely determines whether a person experiences flow or addiction. Unfortunately, they never did carry out a proposed study to examine this hypothesis empirically (Sepehr, personal correspondence).

Measuring gaming flow. The findings on measurement of flow in video gaming reveal that researchers used questionnaires incorporating the flow scale Jackson and Eklund (2002, 2004) developed for researching flow in sport. The instrument was not considered valid for all gaming populations. Nah et al. (2014) speculated that because gaming is a cognitive rather than a physical activity, a scale to measure flow in sport is not applicable.

Interactivity. Interactivity was another area of interest for me, as different levels of interactivity could explain variations in flow experience in my participants across the two activities under scrutiny. There are two ways to look at this. First, Nah et al. (2014) reported on the work of Kim, Oh, and Lee (2005), who found that interactivity between humans during gaming could help promote flow as skills were developed and challenges
overcome in cooperation with others. They also reported that interactivity that is built into a game can give a player greater control over the game in balancing skills and challenges. This suggests that the affordances of video game play might be more conducive to flow than the affordances of the piano. On the other hand, Nah et al. (2014) pointed to the work of Thin, Hansen, and McEachern (2011), who reported that body movement-controlled video games were better than traditional video games at promoting flow.

**Nomological networks.** In terms of assessing nomological networks for flow — researchers looking for theoretical and empirical linkages between constructs — I want to highlight a couple of interesting findings. Chiang, Lin, Cheng, and Lu (2011) found that “non-violent video games created higher levels of flow experience than violent games” (Nah et al., 2014, p. 100). Lee, Aiken, and Hung (2012) surveyed college-aged video game players about their clarity of self-concept and flow experiences in gaming. They found that 1) those who played more video games had “lower levels of self-reported consistency and stability in their lives” (p. 678), 2) the more time spent playing video games, the greater the frequency of flow experiences in gaming, and 3) there are gender-related differences in the psychology and preferences of gamers.

**Antecedents of flow.** In addition to the meta-study of Nah et al. (2014), I looked at Hsu’s (2010) work on the antecedents, facets, and consequences of flow in video game play. Hsu administered an online questionnaire to self-selected video game players and found three main antecedents of flow: 1) perceived ease of game learning and play, 2) immediate feedback during game play, and 3) challenge-skill balance. Although clear goals are a key component of Csikszentmihalyi’s (1990) model of flow, Hsu found that
clear goals did not have a significant effect on the flow experience of the respondents to his questionnaire. Hsu did not distinguish between game types; he noted that the flow experience might differ not only according to individuals but also according to the types of games they play. He further noted that gender might influence flow experience, citing studies that indicate, “women and men differ in their perceptions of IT usage” (p. 62).

*Children’s video gaming.* Inal and Cagiltay (2007) studied flow in children playing computer games in groups in a classroom environment. Through a combination of observation and questioning, they found that groups of boys exhibited more flow experiences than did groups of girls. The boys played more challenging games and stuck with them for longer periods of time. The girls selected games with lower challenge, like dressing up Barbie, and they tended to switch games more frequently. Inal and Cagiltay discussed gender differences in attachment to ludic versus narrative aspects of a game. They said girls cared more about narrative while boys were more indifferent to the actual subject matter of the game; girls would finish the Mario game so they could rescue Mario’s wife, not because they cared about conquering the challenges along the way.

*Gender and flow in video gaming.* From these last three studies the theme of gender emerges. Several researchers believed there were gender-linked differences in preferences when it comes to video game choice and perhaps to flow experience in gaming. It is possible that gender correlates not only with game preferences but with the type of games that are more likely to induce flow. However, I would argue that the populations studied to obtain these results are both too small and too selective for us to be confident in these assertions of gender differences. What kind of college students are
going to sign up for a study on gaming? I suggest that males are more likely to assume that the world needs to know what they think and feel about computer games; female gamers might not choose to group themselves with these fellows.

**Immersion.** A short detour from the research on flow leads me to immersion in video game play. Jennett et al. (2008), in their introduction to a study that tried to define immersion quantitatively, discussed how immersion differs from flow. Immersion is the psychological experience of engaging with a game but it need not be and indeed is only infrequently an optimal experience. Immersion is an ingredient of flow but it is not flow. Jennett et al. placed cognitive absorption (an attitude toward information technology) and presence (in virtual environments) as other ingredients of the gaming experience alongside flow. Kilili, de Freitas, Arnab, and Lainema (2012) distinguished between flow and immersion by saying that flow always involves the player directing attention toward a goal, while immersion means having a physical or virtual experience without there necessarily being a purpose for it.

**Autotelic Experience**

Csikszentmihalyi (1990) included autotelic experience as one of the core characteristics of the flow experience. As I noted above in the section on flow in general, Engeser and Schiepe-Tiska (2012) warned about circular arguments where autotelic experience becomes both a prerequisite for and a consequence of flow. Autotelic experience remains a great mystery that many researchers are trying to unlock using a variety of tools. In this section I describe research on effortless attention, physical experiences of flow, and the autotelic personality.
Flow as effortless attention. There is a body of research that focuses on flow not in the context of a specific activity but as a cognitive domain. This perspective on flow is important to my investigation because it provides a connecting point between different flow-inducing activities by explaining them all from the point of view of what is happening in the brain during flow. It is an attempt to unpack autotelic experience, which stands in opposition to the conventional idea that increased attention requires increased effort.

Research on flow from a cognitive perspective refers to flow as *effortless attention* (Bruya, 2010a). During flow, the subjective effort involved in concentrating is minimal. Romero and Calvillo-Gámez (2011) pointed out that expansive awareness can also be associated with effortless attention; during flow, a person can register a lot of contextual detail without finding that detail distracting. In creative pursuits this is particularly the case as the person in flow is able effortlessly to incorporate new sensations and insights into the work. Dietrich and Stoll’s (2010) work on the reduction of activity in the pre-frontal cortex of the brain during flow appears to contradict this expansive awareness phenomenon. They theorized that “normal” consciousness is the most fully functional state of consciousness and that altered states such as flow are actually a result of a subtraction of some normal cognitive processes. They used the term “phenomenological subtraction” (p. 165) to describe a state where the specific contents of conscious experience are reduced. The deeper the altered state, the more the subtraction. As such, during flow the brain is theorized to be taking in less, rather than more, contextual detail.
**Physical aspects of flow.** Looking specifically at motor learning, which connects to my interest in playing the piano, Wulf and Lewthwaite (2010) presented the constrained action hypothesis. They said that when a person focuses attention internally on the skilled movement he or she is trying to produce, automatic motor processes are disrupted and inefficient. Rather, focusing the attention externally results in more efficient physical movement, along with greater fluidity and speed. For example, when a golfer focuses attention on the swinging motion of the club instead of on the specific motions of his or her arms, the accuracy of the shot is greater. They hypothesized the idea of a “self-invoking trigger” (p. 93), in the form of a word or metaphor that shifts attention from internal to external, resulting in effortless attention, or from external to internal, resulting in self-consciousness and “microchoking” (p. 94). I was interested to know whether my participants used any sort of consistent image or phrase — a self-invoking trigger — to help them enter into flow when they played the piano. The idea of external focus resulting in flow connects well to the virtual worlds of video game play.

Csikszentmihalyi and Nakamura (2010) contributed a chapter to Bruya’s book on effortless attention. They noted that humans have evolved a brain that can reprogram itself to adapt to various attentional conditions (e.g., hunter-gatherers need to shift their attention constantly, ADHD-style, while farmers need focused attention to prosper). The Sloan Study of Youth and Social Development involving 858 U.S. teens compared “the phenomenology of effortful and effortless attention in situ” (p. 182) by asking two questions in an ESM study: 1) How well were you concentrating? (on a scale of 1 to 10) and 2) Was it hard to concentrate? (on the same scale of 1 to 10). They took high concentration and high ease of concentration to indicate flow, or effortless attention.
They also asked a number of questions about affect, self-consciousness, challenges, and skills. The results showed that teens experienced more flow in activities that were freely chosen rather than obligatory; leisure activities produced more flow than schoolwork.

Csikszentmihalyi and Nakamura (2010) reiterated the three conditions for effortless attention that appear in the literature on flow: 1) clear goals, 2) immediate feedback, and 3) “a balance between opportunities for action and the individual’s ability to act” (p. 186), or challenge-skill balance. They stated that the more you understand about the environment in which you find yourself, the more likely you are to become absorbed in your activity (e.g., an expert climber “gets” the rocks). This seems to me to be a great way to explain the conditions for flow in certain kinds of video games. In a game like Defense of the Ancients, there is a great deal of esoteric detail the player needs to know in order to play successfully. The layering of environmental detail with motor reactions and multi-sector attentional focus certainly seems to be a recipe for flow.

Bruya (2010b) has designed an entirely new model for looking at attention: the Apertures, Draw, and Syntax (ADS) model. The key concept in this model is interest, which increases as a person continually renews attentional focus on ever more complex aspects of the environment and seeks out ever-greater challenges to sustain enjoyment (which is not the same as pleasure). Humans are problem-solvers; a life free of obstacles is what we aspire to but it is not really what we want because freedom from problems to solve is captivity to meaninglessness.

The autotelic personality. Csikszentmihalyi (1990) stated that there is no clear evidence that genetics play a role in the ability to control attention and experience flow.
Nevertheless, researchers have identified a number of personality traits that seem to inhibit flow experience. Csikszentmihalyi mentioned schizophrenia (where people cannot filter stimuli and overinclusion occurs), attention disorders, and excessive self-consciousness or self-centeredness. He also named two social conditions that parallel these last two: anomie (lack of rules) and alienation (a social system that constrains people from pursuing their goals). Transferring these conditions to the context of the family, Csikszentmihalyi stated that a person’s experience in the family affects the autotelic personality through five channels:

1) Clarity — kids know what parents expect from them
2) Centering — kids believe their parents are interested in them
3) Choice — kids feel like they have a variety of possibilities from which to choose (including disobedience, with its consequences)
4) Commitment — kids feel comfortable setting aside their defenses and participating unselfconsciously
5) Challenge — parents provide kids with increasingly complex opportunities.

There is a theory that people whose personalities exhibit a certain kind of perfectionism have a harder time finding flow. Dietrich and Stoll (2010) wrote that perfectionism has two dimensions: positive-striving and self-critical. They said only the second kind is detrimental to flow because it leads people to engage in metacognitive processes about factors external to a task rather than focusing on the quality of the activity itself. They hypothesized that perfectionists may have an elevated baseline of activity in the pre-frontal cortex, which needs to be calmed to induce flow.
Ullen, de Manzano, Theorell, and Harmat (2010) looked at physiological correlates of flow and “flow proneness,” which suggests that some people might have an autotelic personality that finds flow more easily. In research with university student participants, they found that neuroticism, or emotional instability, was negatively correlated with flow proneness. They also found no relationship between intelligence and flow proneness. People with an internal locus of control found flow more easily. This connects with Dietrich and Stoll’s (2010) finding about negative perfectionists experiencing reduced flow.

Nah et al. (2014) reported on a study by Khang, Kim, and Kim (2013) that assessed the effects on flow in video game play of self-esteem, self-efficacy, and self-control. They studied Internet, mobile, and video games and found that self-control was most correlated with flow. This connects with the findings on how autonomy relates to flow (Moneta, 2012; Sepehr & Head, 2012). While autonomy has been conceived of in these studies as an environmental rather than as a personality trait, certain people might experience a greater yearning for autonomy independently of their environment, which could manifest as flow proneness.

**Embodied Cognition**

I turn now to consider flow as it relates to embodied cognition, which is the idea that knowledge is “inseparable from our bodies, our language, and our social history — in short, from our *embodiment*” (Varela, Thompson, & Rosch, p. 149). Specifically, I have investigated literature about flow, music-making, and embodied cognition.
In his doctoral dissertation at Princeton, Armstrong (2006) explored an enactive approach to designing digital instruments. He wrote about Csikszentmihalyi’s idea of flow in the context of the coupling of a musician and an instrument; the merging of action and awareness occurs when the response of the instrument is “tightly correlated to the variety of inputs from the body of the performer” (p. 6). As he wrestled with the design of digital instruments, Armstrong noted that one of the chief affordances of an acoustic musical instrument is the resistance it offers to the body of the performer. As a pianist, I can affirm that the movement and feeling of striking the piano keys is integral to producing music that evokes an emotional response in the performer and the listener. In considering the possibilities for digital music, Armstrong was concerned about the way computers limit the possibilities for the body and offer insufficient resistance. He claimed, “the experience of flow, of a heightened sense of embodiment, involves an immediately palpable feeling of active presence in a world that is directly lived and experienced” (p. 8).

Armstrong (2006) laid out the criteria for an activity to be considered embodied. Embodied activity is:

1) Situated (a person interacts with the environment)

2) Timely (there are real-time constraints; a person has to “keep up”)

3) Multimodal (using a person’s cognitive, active, and perceptive resources all at once)

4) Engaging (challenges consume a person’s attention)

5) Emergent (arising incrementally from sensorimotor actions in a particular domain)
These criteria place the body at the center of an enactive model of cognition. In light of Armstrong’s work, it is interesting to ask whether video game play constitutes embodied cognition in the same way that playing the piano does. The chief difference would appear to be the multimodal aspect, where video game play is less demanding of a person’s physical resources. It could be argued that the increased cognitive bandwidth required for complex problem solving and fast reactions in video gameplay takes the place of higher physical demands. Although this is not the place to ask what the cost of substituting higher mental activity for physical actions might be in the very long run of human development, it is a persistent question I have.

In her phenomenological writing about the experience of musical performance, Stubley (1998) referred to Merleau-Ponty in conceiving of a musician and instrument as being “symbiotic parts of a system that collectively demonstrates the property of ‘mind’” (p. 95). She further pointed to Suzanne Cusick’s idea of music performance as a way of “thinking through one’s body” (p. 95). These same concepts appear in research on digital technology, framed in the language of technology being ready-to-hand, where the user is focused on the task and not on the mechanics of the technology, or present-at-hand, where the user’s attention is on the technology itself. This language originates with Heidegger’s (1927/1962) Being and Time. Romero and Calvillo-Gámez (2011) believed that the body plays a central role in flow. They noted that studies on flow in technology use have not distinguished between whether the nature of a task is present-at-hand or ready-to-hand. Even though not all activities require the whole body, they asserted that the body always has a critical role, including in human-computer interaction.
Magnusson (2009) had an interesting perspective on this as he compared acoustic with digital musical instruments. He said that while people learn to play “acoustic instruments through an enactive and embodied practice” (p. 174), the locus of interaction with a computer occurs “fundamentally in the symbolic realm” (p. 174). While the affordances of musical instruments are mechanistic and physical, digital tools are necessarily the result of design decisions where the designer has theorized a limited set of capacities available to the user.

**Conclusion**

This review of the literature has served as an introduction to the concept of flow, including the history of the study of flow and ways to measure flow. I have journeyed through research on flow in music making and in video game play to highlight salient features of these experiences. To provide further insights to compare flow in music making and in video gaming, I also explored the autotelic experience, including the cognitive basis of effortless attention, and embodied cognition, which illuminates the physical aspects of these activities.
Chapter 3: Methodology and Methods

By framing my research question in terms of enquiring into a person’s experience in a pair of activities — playing the piano and playing video games — I opened up possibilities for a broad range of responses. In semi-structured phenomenological interviews, I asked about how it feels to be in flow during video game play and during piano practice. The respondents were free to talk about anything at all — how the body feels, what the mind is doing, feelings of spirituality, and other things I had not thought of. I established a safe space and a rapport between the participants and me so they could recall and articulate their experiences. I obtained proper consent and informed participants about the process without cueing them to prepare detailed responses ahead of time. I was selective about the data I obtained from participants before the interviews and the questions I used to guide our interaction. I performed phenomenological writing, consulted phenomenological and scholarly literature, and conducted thematic analysis using the data from the transcribed interviews.

Overview of the Chapter

I begin this chapter with a series of questions prompted by the literature. These are the wonderings that shaped my research design. Next, I discuss my choice of phenomenological inquiry as the methodology to investigate these questions. I lay out my social constructivist approach to my highly contextual results and reveal additional preparatory activities I undertook before gathering data.

The research design comes next. I describe my choice of participants, how I recruited them, and how I planned the semi-structured phenomenological interviews. I
include descriptions of the actual participants in this chapter because the way I have chosen to present the data in the analysis chapters does not lend itself to the inclusion of biographical sketches.

In the final part of this chapter I describe the way I went about analyzing the data from the phenomenological interviews, orienting myself using the pedagogy of care.

**Questions From the Literature**

For most sections of my literature review, I have created a “Why … matters” statement that connects what I learned from previous research to the topics I hoped to learn about through this research. I used these statements to guide my research design, research questions, and analysis.

**Why flow matters:** Flow is a powerful motivator for a person to go back to an activity again and again without being asked. I assumed young people played video games because they want to (they are intrinsically motivated) and I wanted to see which aspects of piano practice created similar feelings of wanting to engage.

**Why measuring flow matters:** Flow is really hard to measure, especially in a controlled setting. This finding affirmed my decision not to try to induce or measure flow in my participants during the research. Following Csikszentmihalyi’s and Rheinberg’s original approach, I used interviews to interrogate the experience. At the same time, I used the results of studies that have attempted to measure flow to craft interview questions about the chief components and antecedents of flow.
Why current trends in flow research matter: I looked at a source of flow experience — video game play — that is prevalent in recent research and laid it alongside one of the activities associated with flow right from the beginning of flow research — music making. In my interviews I zeroed in on challenge-skill balance along with reduced self-consciousness, a sense of control, and intense concentration, asking about the aspects researchers have found to be most closely associated with the flow experience.

Why flow in individual music making matters: Piano practice is usually a solitary activity. It is useful to know that flow can and does frequently occur in individual activities, including music making. Video game play may be solitary, which makes it a useful comparison activity for piano practice. I asked my participants about their family background in music making; for those with high musical cultural capital, flow in music making might be more a result of habit than a novel experience to be sought out.

Why flow in performance matters: Knowing that research into performance anxiety has been connected to flow and that anxiety inhibits flow affirmed my decision to interview participants about flow experiences rather than asking them to demonstrate flow. I was aware that participants might even view the taping of their practice session and the interview experience as performances. As such, I did not really expect to observe much flow in the participants; carefully crafted phenomenological interview questions were the best route to understanding their experiences.

While the experience of listening to the recorded practice sessions with the participants was fascinating, I chose not to include detailed data on this part of the
research in my analysis. The recording experience delves into interesting questions about performing for an audience that is removed in time and space through digital technology. These questions lie outside the scope of this research.

**Why observing children’s music making matters:** Children operate under complex motivational conditions. I wondered if they might be unable to distinguish between what they themselves wished for and what their parents and teachers wanted them to do. It was important in my interviews for me to gauge my participants’ perceived competence at playing the piano. If they were playing mostly to satisfy parents or teachers rather than for their own enjoyment, I expected their low autonomy to be associated with fewer or no experiences of flow. On the other hand, pleasing a parent or teacher may itself be a form of enjoyment, providing sufficient intrinsic motivation and feelings of autonomy.

The interviews, which were designed to be flexible, took a direction that did not explore very deeply the participants’ perceived competence at playing the piano. In the data I did not see great variation in the amount of autonomy the participants expressed when it came to piano practice. They all did it for social reasons, as I discuss in the analysis, but at the same time they all claimed to practice of their own volition and for personally important reasons. The relationship between autonomy and flow is something I do not include in the analysis.

**Why adolescent music-making matters:** Motivation and autonomy again come into focus here, as adolescents experience particular pressures to meet the expectations of parents, teachers, and peers. I expected to find that they might not be clear on whether
any flow they experienced in music making was caused by intrinsic motivation (autotelic experience). However, comparing their music-making to video gaming was sure to bring out contrasts in motivation, assuming that their parents and teachers were not commanding them to play video games.

**Why presence in video gaming matters:** I was curious to know whether for my participants actually being present as the musical self seated at the piano felt anything like being present in the virtual world of a video game.

**Why social factors in video gaming matter:** It is easy to assume that flow is the main reason my participants would return to their preferred video games, but it was interesting to wonder whether there were other factors, such as escaping from a less-desirable task. I was curious to know whether social pressures would exert the same effect on my participants’ piano practice and on their video game play.

**Why measuring flow in video gaming matters:** By circling back to phenomenological inquiry, which is how Csikszentmihalyi and Rheinberg originally explored the flow experience, I expected to uncover some unique aspects of measuring flow in gamers.

**Why interactivity in video gaming matters:** To the extent that playing the piano involves body movement-based control of the music, there may be a connection here to suggest that embodiment is a key feature of flow, whether in gaming or in piano practice.
**Why addiction in video gaming matters:** I was interested to find out about the social context of my participants’ engagement in video game play to see whether their flow experience was more like passion or more like addiction.

**Why gender in gaming flow matters:** I wanted to see whether gender differences existed in flow experience in piano practice. The research on flow in music making did not reveal any differences between the genders but it is hard to know whether this is because differences do not exist or because the researchers were not looking for these differences. While I am female, my game preferences definitely lie in the ludic rather than the narrative genre. It was important for me to be aware of possible gender-based differences in game choice among my research participants, while at the same time not assuming that they would have certain preferences because of gender. As it turned out, despite my best efforts I was not able to recruit any female participants for this research. It is therefore impossible for me to say whether my results are true for people in general or only for males. I leave the issue of gender here for the reader’s consideration but I do not deal with it in my analysis.

**Why effortless attention matters:** Effortless attention has been found to be experienced more often in activities that are undertaken voluntarily. To the extent that my participants felt their piano study to be obligatory, they might be expected to report less flow in piano practice than in video game play. I also expected to find that interest and the perceived meaningfulness of an activity would have an effect on the flow experience of my participants. Flow would be greater in piano practice if participants perceived music making to be in service of a greater good, and less in video gaming if it has no
perceived purpose or focus of interest. On the contrary, for participants who engaged in MMORPG (massive multi-player online role playing games), the social aspects of gaming might provide an external focus of interest (to combine the ideas of Bruya here and of Wulf and Lewthwaite (2010) above) to enhance flow.

**Why the autotelic personality matters:** Csikszentmihalyi’s (1990) ideas about the autotelic personality helped point me toward personality traits to watch for in my participants. Intelligence should not matter for flow, but neuroticism might. Csikszentmihalyi (1990) also pointed to family characteristics that influence flow. In my interviews with participants, I wanted to note any comments they made about their family experience and ways in which their parents’ choices might affect their ability to achieve flow. I also wanted to ask my participants questions that would assess their self-control and feelings of autonomy. I did ask these questions, but, as I noted above in the section on observing children’s music making, the responses on autonomy were fairly standard and so I did not include them in the analysis.

**Why immersion matters:** I wanted to ask at least some of my participants to distinguish feelings of being immersed in video gaming or piano practice from feelings of flow. I tried to tease out the difference between doing something just because it is there and doing it because of intrinsic motivation to pursue a goal.

**Why embodied cognition matters:** I was interested to hear from my research participants whether the way they used their bodies was important to their experience of flow. I also wanted to know whether the feeling of active presence was equally compelling in the context of the virtual world of a video game as it is in the direct
experience of playing the piano. Ideas about the mind-body symbiosis in flow activity were important for my investigation because I was interested in ways in which different uses of the body might affect my participants’ experience of flow. Would the piano, which involves the whole body in sitting up straight, supporting the core as the hands and arms move in fast and fluid motion, and using the feet for support and sometimes for the pedals, draw the player into flow more intensely than the computer, which requires far less physical coordination? On the other hand, perhaps the computer would be more readily experienced as ready-to-hand, as there are fewer physical details to attend to in accomplishing a desired task.

I also wondered whether my participants would report differences in their flow experience relating to the physical versus symbolic nature of the technology; the piano is very physical, while video games are more symbolic.

**Phenomenological Inquiry**

**Reductio and vocatio.** I chose phenomenological inquiry to investigate my research question. A qualitative method, phenomenology permits open-ended interview techniques that create space for the details of a person’s lived experience to emerge. *Reductio* (van Manen, 2011) is a starting point of phenomenological methodology that brackets “normal conditions” and asks what is really going on. It is a way of drilling down to the root of an experience by stripping away the idealized version that carries with it judgments and expectations. In terms of enquiring about how it feels to practice the piano, this means putting aside the narrative of sitting down at the piano with all the materials I need and systematically playing through all that is required to train my body,
mind, and ear for that day. Rather, reductio asks me to tell about how when I practice I play sections of music but I also mumble a lot, get up to find a pencil to mark fingerings in the music score, play a measure a few times in straight time and then a few times in swing time to get it to “stick” in my fingers, look at the clock, curse the composer, scratch my bum, run my hands through my hair, look at the clock again, and bend the corners of the pages so the page turns proceed more efficiently.

Max van Manen (2007) wrote about using phenomenological inquiry to grasp the world pathically. He defined pathic as “the general mood, sensibility, sensuality, and felt sense of being in the world” (p. 20). This description of experience fits well with what flow researchers have been keen to discover, especially in the early stages of Csikszentmihalyi’s (1975) and Rheinberg’s (1982) research when they used phenomenological interviews to gather data.

In the methodology of phenomenological inquiry, reductio is followed by vocatio (van Manen, 2011), which is the act of putting into words the prereflective experience. A good reason for using open-ended phenomenological interviews to gather my data was that the interview setting would be the first time participants had the opportunity to think about the questions I asked. By inviting participants to bring me a short recording of themselves playing the piano, I hoped to open up a small space for them to enter back into the feeling of the activity as we listened to the recording together. Following Csikszentmihalyi’s Experience Sampling Method (ESM), I proceeded straight into questions about the experience so the participants could answer without taking time to analyze.
The reason for trying to avoid having the participants analyze the experiences they related is that pure descriptions of lived experience are a rich ground for extracting themes that tie experiences together. Van Manen (1997) asserted, “lived experience is the starting point and the end point of phenomenological research” (p. 36). It is the telling of stories and anecdotes about what it was like to be in a particular moment, without analyzing or judging. If, for example, I simply asked each participant to judge how interesting it was to play a particular Beethoven sonata, I would miss hearing about the frisson Sheila felt at the rising melody line in the second movement and about the heaviness in Brian’s left arm as he brought out the bass notes at the end of the first movement. Because pianists’ bodies are usually ready-to-hand, we might not think to recount our lived experiences of music making unless asked to direct our attention to them. There is also a lot going on cognitively that we can describe. For example, I build a melody line in anticipation of the surprise deceptive cadence that I know will carry it even further. This ongoing musical analysis is, I would argue, part of the lived experience rather than a metacognitive act. It is yet another way of interacting with the musical environment.

**Collecting stories using interviews.** The specific way I applied phenomenological inquiry was by using interviews. Van Manen (2007) wrote that one purpose of the interview is for “exploring and gathering experiential narrative material that may serve as a resource for developing a richer and deeper understanding of a human phenomenon” (p. 66). The human phenomenon I investigated is the experience of flow. My interview
questions were designed to elicit experiential narrative, or stories of each participant’s particular lived experience during piano practice and while playing video games.

**Generalizability.** What good is it to collect a few stories of teenagers practicing the piano and playing video games? As a trained economist, I am the first to admit that collecting stories of people’s feelings hardly seems to be a recipe for generalizable results. But it is interesting to read behavioural economist Richard Thaler’s (2000) assertions about the *false consensus effect,* wherein “we tend to think others are just like us” (p. 133) and the *curse of knowledge,* where “once we know something, we can’t imagine ever thinking otherwise” (p. 133). It is easy to assume that users interact with beautifully designed video games in exactly the way the programmers envisioned. But how can we really know unless we ask? It is easy to assume that a person who is able to perform a piece of music on the piano has followed a particular sequence of actions to learn it, but how can we know what motivated him or her to persevere unless we ask? Homo economicus — a perfectly rational, predictable being — definitely does not exist, which means we need to get to know real people. If the themes that emerge from my phenomenological writing about my participants’ experiences resonate at all with other pianists, gamers, and those who experience flow, then this investigation will have contributed to our understanding of the conditions that get humans hooked on an activity. The findings of my investigation may be considered generalizable if they garner the “phenomenological nod” that Buytendijk described as the way we respond to hearing or reading an account of “an experience that we have had or could have had” (van Manen, 1997, p. 27).
I deliberately avoided trying to measure participants’ experiences of flow. The literature made it clear that there are many difficulties with measuring flow. My investigation of flow made an end run around this complexity by doing two things: 1) assuming that flow occurred in my participants for at least one of the two activities (playing music and playing video games), and 2) comparing participants’ flow experiences during the two activities rather than trying to establish a precise level of flow or non-flow in either activity.

My review of the literature on flow in music making and in video gaming gave me many clues about contextual factors that might restrict the generalizability of my results to particular social, cultural, or personality contexts. In this chapter I will provide as much context as possible about my research participants and my own biases so that others can make their own judgments about the applicability of my findings in other contexts.

**Social Constructivism**

I approached this investigation into the experience of young people’s piano playing and video game playing with a social constructivist worldview. This means that I believe that the knowledge I gain about each participant’s experience will be strongly contextual, depending upon social and cultural factors that shape the inquiry. However, by actively pursuing accounts of lived experience I can do phenomenological writing that draws out the essence of their experiences, which is how Solomon (1972) claimed that phenomenological researchers produce generalizable results. I treated my research participants as Subject Matter Experts (or SMEs in instructional design parlance) — people who are the foremost authorities on their own experience. Just as Hartas (2010)
described, I wanted to “empower participants’ perspectives and ideas, and obtain rich descriptions of the contexts that surround their lives” (p. 44).

While I entered into this investigation with my own experiences and ideas about flow in piano playing and in video gaming, I tried continually to reorient myself to being open to hearing and eliciting new perspectives from the participants rather than simply looking for confirmation of what I already believed to be the core aspects of the flow experience.

**Additional Preparation**

Besides drawing on my life and work experience and conducting a thorough review of the literature, I chose to do a few other things to prepare myself to conduct this research. First, I spent some time watching a friend play Defense of the Ancients (DOTA). He played through an entire game as I watched and asked questions. I observed moments where he had to concentrate entirely on the game and could not sustain conversation as well as times when his actions seemed to be routine and he was able to provide commentary. I got a taste of the scope of the arcane knowledge and physical routines that are required to play this kind of video game successfully. This was useful because I expected some of my research participants would be players of this kind of extended role-playing game, while I myself am more familiar with and interested in puzzle and word games.

Next, I volunteered to participate in two different research studies at UNB. One was a psychology study and the other was for the Institute for Biomedical Engineering. It was helpful to have the experience of being a participant, giving consent, listening to the
researcher explain the purpose of the research, and following the researcher’s instructions.

Lastly, I completed the undergraduate music conducting course at UNB Fredericton. This allowed me to have a fresh experience of learning that involved complex coordination of body, mind, and emotion. I was reminded anew of the challenges of knowing the actions I want my body to perform but not yet having them come naturally. This seemed like a reasonable parallel to the challenges experienced by both piano learners and novice video game players. My long experience learning new piano music helped me isolate and repeat particular chunks of physical actions, unprompted, to allow them to become natural. For example, conducting an orchestra involves independent bimanual activity, where one hand (usually the right) performs the pattern of the beat and the other hand both indicates dynamics (louder and softer) and cues players about when to come in. The hands initially want to work in parallel, where one automatically imitates the other. It takes practice and mental coordination to place one hand on autopilot in order to perform deliberate actions with the other. This parallels the process of learning to play bimanual, non-parallel piano music as well as the experience of computer video gaming where one hand operates the mouse and the other the keyboard.

**Participants in the Research**

In this section I describe my selection criteria for participants in the investigation, provide rationale for my choices, and outline the method I used to find these people.
I conducted phenomenological interviews with four piano students between 11 and 17 years old and one adult who studied piano as a teen. All are also avid players of video games.

**All genders.** I did not try to recruit a particular gender mix for this investigation, although I hoped that a variety of genders would choose to participate. Despite repeated efforts to find female participants, I ended up with only male volunteers.

**Ages 11 to 17.** I chose to focus on adolescents for a few reasons. First, people this age are likely to be engaged in weekly lessons with a piano teacher as well as daily practice sessions to prepare for those lessons. Younger children have not yet developed these habits and people who have finished high school are less likely to be involved in serious weekly piano study. I wanted to speak with SMEs who had built up practice habits and who would be able to articulate what they do during practice.

Second, adolescents are more likely than younger children to be regular players of video games. They have more autonomy in their leisure choices and are more likely to have permission from their parents to own and use cellphones, computers, tablets, and gaming consoles.

A third reason for speaking with adolescents is that my larger research agenda is to find ways to keep people this age “hooked” on piano learning. The beginning of middle school is a time when many piano students quit lessons. In my experience, this is not because they do not enjoy their piano lessons and the act of playing the piano. Rather, they are unable to motivate themselves to practice piano daily in the face of many other competing activities, including but not limited to the wide online world that is opening up
to them at this age. By interviewing people who have found a way to combine piano study with video game play, I hoped to find common elements that keep them engaged in piano learning. Educators may be interested in discoveries about these SMEs’ ways of being in the world.

My initial participants were two 14-year-olds, one 16-year-old, and one 17-year-old. After the first set of interviews, I was able to add one more participant who was 35 years old but who would have fit my criteria perfectly when he was a teen. I describe this situation in more detail below in the recruitment section.

**Piano students.** Participants in this research were engaged in weekly private lessons with a piano teacher. Normally for piano students there is an expectation of daily practice at home between lessons, although I did not interrogate the frequency of participants’ practice when I recruited them. In my experience, there is wide variation in how much time students spend practicing.

I chose to limit participation to piano students rather than students of other instruments chiefly because I am most expert on piano instruction. A professional pianist and experienced piano teacher, I can easily gauge students’ technical, aural, and theoretical proficiency on the piano. I effortlessly attend to details in piano performance and would be able to establish rapport with participants by being knowledgeable about piano repertoire, practice realities, and performance expectations for students.

The physical demands of playing the piano are such that a pianist with proper posture and technique can play for a very long time without tiring. This has implications for investigating the flow experience, as complete absorption in an activity that shuts out
the passage of time would be different if there were physical limitations that prevented
flow from continuing. If I were to lay the experiences of pianists alongside, say,
clarinetists or violinists, I might find that their length and depth of absorption in music
differs because of things like embouchure fatigue (clarinet) and arm fatigue (violin). It is
ture that pianists who experience tension, especially in their hands and wrists, cannot play
as long as those who maintain a relaxed technique. Another consideration is that playing
the piano does not involve the breath in the same way as playing a wind instrument or
singing; there is usually no need to stop to rest the diaphragm or to hydrate the trachea.

A final consideration in using piano students is that playing the piano is a
sufficiently complex and challenging activity that it is a good candidate for inducing
flow. Parsons, Sergent, Hodges, and Fox (2005) noted that musical performance “may be
the pinnacle of human central nervous system performance” (p. 199). The complexity of
bimanual movements involved in playing the piano is such that researchers have
observed differences in inter-hemispheric connections in pianists’ brains (Globerson &
Nelken, 2013).

In addition to my positive reasons for choosing piano students as participants in the
investigation, let me list a few things I did not care about in order to demonstrate why I
limited the screening of participants.

I did not care about the style of music my participants practiced most, although I
assumed that at this age they are playing music that 1) is bimanual (both hands play at the
same time and not in parallel motion), and 2) is at least partly of their own choosing,
though the choices may be in consultation with their piano teacher. I assumed that at least
some of the music they practiced would be music they really enjoyed.
Second, I did not care about whether or how often participants gave public piano performances in teachers’ studio recitals, music festivals, or other situations. I planned to ask them about their experience practicing alone in private, not about their feelings in performing for an audience. There is extensive research on performance anxiety that makes it very clear that public performance is different psychologically from private practice (e.g., Kirchner, Bloom, & Skutnick-Henley, 2008).

**Not beginners.** While I did not specify the particular level at which my participants studied piano, I felt it was important that they not be absolute beginners on a musical instrument. They needed to have experience in coordinating their mental and physical efforts at the piano in order for the conditions for flow to exist. Some participants may be playing sonatas and concertos, while others might be learning a simplified arrangement of “Let it Go” from the movie Frozen. Research on the flow experience shows that for flow to occur, challenges and skills must be both balanced and high relative to what the person normally experiences (Keller & Ländhaußer, 2012). Music that would be ridiculously easy for one participant may present a real flow-inducing challenge for another.

**Video game players.** It was easier to search among the pool of piano students for people who also enjoy gaming than to go searching the world of gamers to find those who are also piano students. And so, after belonging to the right age category and being students of piano, I asked that participants in my research be avid video game players. A Pew Research Center report in 2008 said that 97% of sampled U.S. teens played computer, web, portable, or console games. Of those, 50% replied that they had played a
video game “yesterday” and the daily players reported that they usually play for an hour or more (Lenhart et al., 2008). Assuming that a survey of Canadian teens would yield similar results and that the increasing prevalence of mobile devices in the hands of teens provides greater opportunities for time spent gaming, it is safe to say that more than 50% of Canadian teens currently spend an hour or more playing video games each day.

Using these assumptions, I chose to consider an avid video game player as someone who plays for at least seven hours per week. By using a weekly total, I could capture students who were involved in other activities (e.g., music) that might limit their game play on certain days of the week. For students who might have trouble estimating a weekly aggregate, I framed the requirement as seven hours or more per week (or one hour or more per day).

Players on any device were eligible to participate. The range of possibilities included: consoles like Xbox, PlayStation, and Wii; desktop and laptop computers; portable gaming devices like Nintendo DS, GameBoy; mobile devices like iPads and tablets (e.g., iPads); and cellphones and smartphones.

Players of any type of video games were eligible to participate. I was interested in players of anything from Candy Crush to World of Warcraft, from Mariocart to Eve. Solo or social, quick puzzle-solving or endless quest, rapid-response or outside of time. While there are clear parallels between playing the piano (usually solo, rapid-response, and not endless) and games that share these features, I was interested in exploring both similarities and differences between participants’ preferred games and their piano playing experience.
**Locals.** As I intended to conduct face-to-face interviews with each participant, they needed to be located within a reasonable driving distance of the city of Fredericton, where I live.

**English speakers.** New Brunswick is a bilingual province and Fredericton is home to people with a variety of first languages. English is most prevalent, followed by French. There is also a large community of recent immigrants, mostly from South Korea and China, due to government incentives to promote population growth in the province. Many children of families from Korea and China come with prior musical training and choose to continue their piano studies with a local teacher. Because my phenomenological investigation hinged on in-depth interviews that communicate lots of detail (as opposed to my observing the participants in action), I felt justified in stipulating that participants have reasonable proficiency in oral communication in English. Yes and no answers do not constitute sufficient data. The piano teachers whom I asked to nominate participants were adequate judges of the students’ fluency, as private music study involves weekly conversation between teacher and student. While I am fluent in French, I chose to limit my interviewing to English because the translation issues that may arise in transferring concepts from one language to another are too complex for a study of this nature.

English was the first language of all my participants.

**Recruiting Participants**

**Fredericton Music Teachers’ Association.** I contacted fellow members of the Fredericton Music Teachers’ Association to ask for their help in nominating students to participate in this investigation. The nomination process was informal, through personal
communication (phone, conversation, and email). My pitch to teachers had two parts: the first informed them of the type of students I am looking for, and the second reassured them that the teachers are not at all the subjects of the research and that I would not try to recruit their students. It is fairly common for piano students to change teachers periodically for various reasons; it was important that teachers not see me as a threat to take away their students.

This is the script I used to inform teachers of the participants I sought:

*I am looking for piano students aged 11 to 17 who are taking weekly lessons, who are not in their first year of piano study, and who play video games for seven or more hours each week (more than 1 hour a day). Any kind of video game player is acceptable (console, computer, smartphone, etc.). All genders are welcome. Participants must be able to carry on a detailed conversation in English.*

*This research will ask students to remember their personal experiences and feelings as they have practiced piano and played video games. The piano teaching process is not the focus of this research and I will not be judging or evaluating you as a teacher in any way. There is nothing for you to do to prepare a student for this research. It consists of an hour-long spoken individual interview in my studio. I do not intend to recruit students through this process; ethics forbids it and I will refuse any requests to begin teaching piano to students who participants in the research.*

I also prepared a one-page poster-style research invitation (Appendix 1), which I sent by email to teachers who said they might have students who would fit my criteria. I asked them to print it out to give to potential participants. On the poster I chose to exhibit three gaming logos in order to give participants a cue as to what kinds of gamers would
be welcome. I included the logo for Steam because it is an online game distribution platform that includes digital rights management for many social and solo games, including massive multi-player online role-playing games (MMORPGs) played on a personal computer. I chose the Xbox logo as a signal to players of console games who might play either solo or in an online environment using specialized game control units. Finally, I displayed the logo of King Digital Entertainment, a firm that creates games for mobile devices, Facebook, and Windows 10. King.com offers single-player puzzle games like Candy Crush Saga, Pet Rescue Saga, and Farm Heroes Saga. I thought that these three logos covered a wide range of possible interpretations of what a “video gamer” might be.

**Five participants.** I wanted to interview between four and six participants. Three local piano teachers nominated a total of four participants. Two were brothers who took lessons with the same teacher, and the other two each came from a different teacher. All the nominated participants were male. I pursued a number of teachers who had expressed interest in my research to see if I could find any female participants. One teacher said she had a female student who used to play video games but who had quit in order to focus on other pursuits, so she was not eligible. Other teachers simply said they had no female students who played video games. Another teacher said she had an additional male student who would qualify to participate but he refused to be nominated because his parents did not know that he played video games.

Against my plans and wishes, I ended up with participants who were all male. This caused me to wonder if differences between their experiences and mine were only related
to age differences or if gender might play a role. I felt like it would be a good idea to obtain additional insight from a male who is closer to my age and musical competence.

After I had completed my interviews with four local participants in my original target group, I had a chance encounter with a fellow music teacher whose experience paralleled that of my participants when he was their age. There are a few reasons why I decided to invite him to be interviewed for this research. As an adult, he might be able to explain more fully the phenomena associated with game play. As a more accomplished musician, he might also serve to pinpoint important differences and similarities between piano practice and video gaming. As a male, he might be able to help me understand things that I might not think of because I am female. I knew that Michael (all names are pseudonyms) was married to a woman, which gave me confidence that he would feel comfortable speaking with me about any gender issues that might arise. I submitted a modification of my research plan to the university ethics review board to obtain permission to interview this teacher. Permission was granted and I added Michael to my participant group.

Securing consent. I contacted the parents of each participant by email or telephone to arrange a time for me to deliver the information letter and consent form (Appendix 2) to the family. The information letter contained a broad description of the purpose of the research as well as details of how the research process would unfold and the standard items about participation being voluntary and withdrawal at any time being acceptable. The consent form required the parent of participants aged less than 18 to sign. I also
obtained verbal assent from the participants themselves, both when I dropped off the forms and at the beginning of the interviews.

Once they had agreed to participate, I scheduled a time for the phenomenological interview a few days after this initial meeting to give the students time to undertake the preparatory activity.

The adult participant provided his own consent using a modified consent form. I chose to inform Michael verbally of my intent to allow him to read the parts of my thesis pertaining directly to him before publication. The reason is that as a younger, male member of the local music teachers’ association, Michael would be easy for other music professionals in this region to identify despite the use of a pseudonym. I felt it necessary to take extra steps to protect his privacy. I also wanted Michael to feel comfortable to speak freely during the interview with the knowledge that he would be able to exclude sensitive material at a later date if he chose to do so.

**Preparatory activity.** To prepare for the phenomenological interview, I asked each teenaged participant to undertake a preparatory activity. At the time that I delivered the information letter and consent form, I asked the participant to make an audio recording of about 10 minutes of a piano practice session. He was to bring the recording to the interview. This is the script I used to ask the student to make the recording:

*Please make an audio recording of yourself practicing the piano. I want to hear a part of your practice when you are completely absorbed in the music, where you feel both challenged and very capable. I am not necessarily interested in a polished performance of music you know really well and I won’t be judging the quality of*
your performance. I just want to hear you playing something that really holds your interest right now.

The purpose of this script was to try to elicit participants to enter into flow without trying to explain what flow is. I used the words “where you feel both challenged and very capable” to capture the key element of flow — challenge/skill balance — upon which many flow researchers have chosen to focus (e.g., Smolej Fritz & Avsec, 2007).

The adult participant now works as a composer and music instructor but does not devote time to piano practice. For this reason he declined the invitation to create a recording of himself practicing. As a substitute, in the interview I asked him what he might have chosen to record when he was a teen.

Face sheet. Following the suggestion of Warren and Karner (2010), I gave each participant a face sheet to complete and bring to the interview (Appendix 3). This allowed me to gather some basic information about the participant without using up time in the interview. There are a few things I wanted to know about the participants that they might not be able to answer without consulting with their parents, such as the number of years they had been taking music lessons. Completing the face sheet at home allowed them to answer these questions ahead of the interview. I asked the adult participant to complete the face sheet as though he were 16 years old, to the best of his recollection, so that the data might compare more easily with the other participants.

The Phenomenological Interviews

In this section I describe details of the interview process as I planned it and as it unfolded in practice.
**Location.** It is critically important to establish good rapport between the interviewer and the respondent in a phenomenological interview. Fortunately, most scholars do not believe that the interviewer needs to “match” the respondents in key characteristics (Warren & Karner, 2010). This is a good thing because I clearly positioned myself as another piano teacher, whom the participants might expect to behave in ways similar to their own piano teachers. I expected that when the participants entered the interview they would position themselves as piano students. My task was to remind or persuade them that they were also Subject Matter Experts (SMEs) on the topics of video gaming and their own experiences of flow.

Rapport matters in the choice of location for the interview. I held the interviews in my well-appointed piano studio. The advantages of using the studio were:

- **Privacy.** The studio is located at the back of my home so I have full control over the environment and can ensure we are not disturbed.

- **Equipment.** The studio contains two pianos, computer equipment, and wifi.

- **Parental comfort.** There is a small waiting area outside the studio where parents who did not wish to leave their children during the interview could sit. Although the information letter stated that parents could wait during the interview, none of them chose to do so.

The disadvantages of using the studio include that it is not a neutral location. It positioned me as a piano teacher expert and the participants as students. I tried to challenge this dynamic in the way I framed the introduction to the interview, as I describe below in the section about the interview structure. Most participants were in the space for the first time and I tried to give them some time to acclimate while I looked over their
face sheets. For the interview we sat at opposite sides of a small table in the center of the room. I chose to have participants sit at a table for three reasons. First, it was convenient to have a surface on which to place the digital recorders to record our conversation. Second, we could both see the pieces of paper with the flow description that I read during the interview and the participants could see anything I wrote in my notebook that was open on the table. Third, I know from my husband’s experience as a high school teacher that teenaged boys’ bodies don’t always behave the way they would wish them to in any given moment and it is nice to have some cover.

**Time and duration.** By coincidence, I was able to schedule all four interviews with the teenaged participants on the same Friday. October 9 was a professional development day for schoolteachers, which left all four boys free to attend interviews instead of going to school. I interviewed Sam and James back-to-back in the morning. Their mother drove each boy separately to his interview, which meant we had total privacy for each interview with neither brother overhearing the other from the waiting area. In the afternoon I interviewed Colin and Tristan with a one-hour break between them. I had informed participants that I expected the interview to last about an hour. This is the maximum length of time I felt students this age could be expected to focus in an intense conversation. Sam’s interview was the shortest at 37 minutes, while James’ was 58 minutes, Colin’s was 53 minutes, and Tristan’s was the longest at 68 minutes. Two months later, I interviewed Michael on Friday, December 4 for 62 minutes.

**Interview structure.** Van Manen (2007) cautioned phenomenological interviewers to be very clear about their research question before embarking on interviews in order
that they not overwhelm the participants with long-winded or wandering questions. My interview questions were short and carefully crafted to be open-ended invitations to tell stories about particular experiences of flow both during piano practice and while playing video games.

I used a semi-structured interview format, in which I had several prepared questions but the respondent and I were free to pursue new topics that arose in the course of the conversation. Prior to the start of each interview, I received from each participant a signed consent form and a completed face sheet. Before beginning the interview, I obtained verbal assent that their participation was voluntary. I informed the participants that I would be recording our conversation just for my own reference later. I reminded them that they could ask me to stop and erase the recording at any time and that they did not have to answer a question if they did not want to. I then turned on the digital recording device.

*Introductions.* Each interview began with me introducing myself as a person, a music professional, and a researcher. I made it clear that I had invited the participant to be a SME and that I wanted to hear about their experiences and their feelings as they practice the piano and as they play video games. I was aware that the teacher-student power dynamic might influence the types of responses participants gave; they likely arrived with presuppositions about what would be interesting for a piano teacher to hear. I tried to create an atmosphere of openness by describing my wide musical experience and interests, positioning myself as a fellow musician on a journey. I also listened intently to the recordings the participants brought in as a way of showing genuine interest.
in getting to know them as individual musicians rather than trying to fit them into my mold of what a student is like.

**Interview questions.** Out of my review of the literature that sprang from my main research question emerged a series of more detailed questions. To review, my main research question is: How do young piano students experience flow in their individual music practice and how does it compare to their experience of flow in video gaming?

I organized the asking of the interview questions in a way that would provide the participants with as much choice and autonomy as possible. As self-consciousness has been found to inhibit flow (Moneta, 2012), I felt that respondents would have the best chance of recalling and talking about their flow experiences if they felt free.

I designed the questions as open-ended invitations to describe lived experiences. However, acknowledging the reality that teenaged boys may not readily wax eloquent at the slightest provocation, I prepared detailed probing questions to help them articulate their experience. These questions were guided by the four existentials: *lived space, lived body, lived time*, and *lived human relation* (van Manen, 1997). While there are many specific questions I wanted to ask participants about challenge-skill balance, motivational factors, and how goal-oriented they were in their activities, phenomenological inquiry restricted me to asking for pure descriptions from which I might later be able to draw conclusions about these things. Here are my interview questions:

1. Let’s listen together to the recording you brought along of yourself playing. Tell me what it felt like when you recorded this. [For the adult participant, I asked what he would have chosen to record when he was 16.]
• Where were you playing? What else was going on around you?

• How did your body feel as you played? Tell me about your legs and feet, your guts, your arms and hands, your headspace.

• How did you experience the passage of time as you played?

• What other people were involved in the experience? Who knew that you were playing? Who else cared about your piano playing experience?

2. I would like to read you a short description of a feeling called Flow.

• My mind isn’t wandering. I am not thinking of something else. I am totally involved in what I am doing. My body feels good. I don’t seem to hear anything. The world seems to be cut off from me. I am less aware of myself and my problems.

• My concentration is like breathing, I never think of it. I am really quite oblivious to my surroundings after I really get going. I think that a phone could ring, the doorbell could ring, or the house could burn down or something like that. When I start, I really do shut out the whole world. Once I stop, I can let it back in again.

• I am involved in what I am doing. I don’t see myself as separate from what I am doing.

(from Csikszentmihalyi & Csikszentmihalyi, 1998, p. 139, as cited in Inal & Cagiltay, 2007)

Please tell me about a time when you felt the most like the description I just read.
3. Please tell me about a particular time when you felt like the Flow description when you were playing a video game.

- Where were you playing? What else was going on around you?
- How did your body feel as you played? Tell me about your legs and feet, your guts, your arms and hands, your headspace.
- How did you experience the passage of time as you played?
- What other people were involved in the experience? Who were you playing with? Who knew that you were playing? Who else cared about your game experience?

4. Now tell me about a time that you played the piano and felt similar to how you felt when you played the video game we talked about earlier.

5. How did your body feel when you played the video game that made you feel in flow? How does that feeling compare to the time you played the piano in flow?

6. How was your control over your body similar or different when you played the video game and when you played the piano?

7. Please tell me about a time that you used digital technology (smartphone, computer, tablet, etc.) during a piano practice session.

8. Is there anything else you would like to tell me about your experiences playing the piano or playing video games?

The interviews unfolded as anticipated. We began by listening to their recordings and then I proceeded through the remaining questions. I often interjected other questions to ask for clarification or to follow up on a particularly interesting statement. In
particular, I found myself asking each participant to talk more about mistakes when the
subject came up naturally both in the context of gaming and of piano practice.

We suffered no interruptions other than a couple of unanswered telephone calls.
There was total privacy for each interview, as none of the parents chose to wait in the
waiting area. I did not take many notes and I kept my interview questions tucked under a
blank page when I was not looking at them so the participants would not be distracted by
trying to read my questions upside down.

**Conclusion of the interview.** I thanked participants for their responses and offered
each a $15 Subway restaurant gift card as a token of appreciation. This is enough to buy a
generous meal. I had not told them in advance that they would be rewarded and they all
seemed thankful.

**Meet the Participants**

In this section I present some basic descriptions of the participants that incorporate
information from the face sheets with details I learned during the interviews. I also
include a brief impression of their personality because of the findings of
Csikszentmihalyi (1990), Ullen et al. (2010), and Dietrich and Stoll (2010) about the
flow-proneness of particular personality types. All names are pseudonyms chosen by me
to reflect the gender and approximate cultural background of each participant. I present
the participants in the order in which their interviews occurred.

**Sam.** Sam is a 14-year-old high school student. He has an older brother who is also
a music student and video gamer. He has been taking piano lessons for about 10 years
and has had trombone and saxophone lessons for about three years. He usually practices
piano for about 20 minutes each day when he comes home from school. On weekends he practices too, but his mom sometimes has to remind him. His mom took piano lessons for many years when she was younger. Sam is not allowed to play video games on school days so he makes the most of his weekends, playing for three or four hours a day. The longest he has ever played a video game at a single stretch is about three hours. The longest he has ever spent playing the piano in a single session is 20 minutes. He usually plays on a console in a common room in his house. His favourite games lately are Destiny, Evolve, Super Smash Brothers, and The Legend of Zelda: The Wind Waker. He sometimes plays on his cellphone, Nintendo DS, and PlayStation Portable. In his interview, Sam appeared to be a happy, easy-going person who expressed himself more readily with smiles and gestures than with words. Sam’s recording of his practice included some technique (four-note chords) and four pieces in a range of styles from jazz to rock to classical, all played with polish and energy. My impression of Sam was that he is a person who finds contentment easily in many activities and, while he enjoys doing well, does not put a lot of pressure on himself to be perfect.

**James.** James is 16 years old and is Sam’s older brother. Like his brother, he has taken piano lessons for about 10 years. He has also played the trumpet for the past three years and he spends more time playing trumpet than piano these days. He is planning to audition on trumpet for a university music program. He practices piano for at least 20 minutes five days a week at a time of his choosing or if his mom asks him to. James’ video game play is also limited to weekends, when he plays for three to four hours a day. In summer he plays even more. His current favourite game is Destiny and his favourite
Colin, Colin is a 17-year-old Grade 12 student who has had 11 years of piano lessons. He also plays trumpet in both the concert band and the jazz band at his school. His piano practice at home happens when he feels like it, and he usually practices for 30 minutes six days a week. His parents have not had music lessons and he has no siblings. His current favourite video game is Monster Hunter 4 Ultimate, which he plays on his handheld Nintendo DS XL. His favourite game ever is Portal. He also plays games on computer, console, cellphone, and occasionally a tablet. He plays video games for about an hour a day on school days and two to three hours on weekend days. In his interview Colin rarely looked me in the eye and he sometimes allowed long silences to elapse before responding to a question. He had brought along his hand-held gaming device so he could demonstrated its use. Colin’s recorded practice session was a demonstration of his work in progress on Aria di Mezzo Carattere, a piece of music from the Final Fantasy
video game series. This was not a fluent performance, as Colin paused frequently to coordinate his movements to bring the right and left hand rhythms and notes into synchrony. My impression of Colin was that he is an intense person who is very conscious of the impression he presents to others and who analyses his actions carefully. He seemed like he might be someone who worries a lot.

**Tristan.** Tristan is a 14-year-old high school student who has three younger sisters who also take music lessons. Their parents did not study music as children. Tristan has had five years of piano lessons. He practices when he feels like it and tries to do three practice sessions a week lasting about 45 minutes each. His current favourite video games are Life is Strange and No Limits 2, and his favourite game ever is Minecraft. He plays for about two hours on school days and five hours on weekend days. He usually plays on the computer in his bedroom and sometimes plays on a console, tablet, or cellphone. In his interview, Tristan appeared to be a warm person who was pleased to participate in the research. Tristan’s recorded practice session revealed his working process in learning the song *Runaway* by Galantis. He played the right hand, followed by the left hand, and then worked, with many pauses, at putting both hands together. He was visibly uncomfortable as we listened to his recording but we managed this by having a conversation as we listened. Tristan was pleasant and thorough in his responses to my questions. My impression of Tristan was that he is a thoughtful, caring person who wants to please others but is currently unsure of his goals for himself. He was extremely self-critical of his piano recording but was otherwise self-confident and easygoing.
Michael. Michael is a 35-year-old composer and music teacher who took piano lessons and played video games when he was a teen. His parents were amateur musicians who loved to sing; his father also played keyboard accordion. He has an older brother who studied the guitar. When he was 16, Michael had taken piano lessons for eight years. He practiced piano for about 50 minutes four to five days a week. His parents had no input into his practice routine; he was completely autonomous. He also studied music history and harmony and he took guitar lessons for two years. He played video games for one hour on school days and for up to six hours on weekend days. His favourite games were X-Com: UFO Defense and Heroes of Might and Magic. He usually played on the computer and sometimes played on a console. Michael’s piano practice was negatively impacted when he developed carpal tunnel syndrome in his wrist from playing video games on the computer. In his interview, Michael was garrulous and eager to share his knowledge. He repeatedly and knowingly evaded answering phenomenological questions directly and so this interview ended up being more about analysis than about his direct experience, although he did provide moments of insight into his experiences. We covered a wide range of topics as the interview questions led him to recall a variety of experiences both in gaming and in piano practice. Michael did not bring in a recording of his piano practice, as he no longer practices regularly. My impression of Michael was that he is a confident musician who has high expectations of himself in all areas of life and is disappointed when he does not fulfill them.
Analysis

The conclusion of the interviews was the end of my data collection process. Although I began to analyze the transcripts of the first four interviews with the teens before I conducted the interview with Michael, the bulk of the analysis used data from all five interviews. I conducted the analysis using a combination of phenomenological writing and coding the transcripts to extract themes, which I developed with the help of other phenomenological writing and scholarly sources.

The limits of phenomenology in this study. One of the tricky things about doing phenomenological analysis of flow experiences is that the concept of flow is already a distillation of a whole other process of phenomenological study. Csikszentmihalyi (1975) and Rheinberg (1982) both started out with phenomenological interviews and then engaged in a process of extracting common elements in people’s peak experiences that resulted in Csikszentmihalyi’s (1990) list of the eight key elements of flow. These are the essences that distinguish between flow and not-flow. In delving into a further phenomenological study of flow, I wanted to know if the same elements produced the essences of flow in both piano practice and video gaming. This is like asking why an apple and a cupcake both taste sweet even though they look different and behave differently in my mouth and body. But not every apple tastes sweet and a baker can forget to add the sugar to the cupcake batter. The eye cannot check for sweetness — the tongue must do the tasting.

The tasting came in the interviews. The chief obstacle I encountered in examining my transcripts was that no one participant claimed unequivocally to have experienced
flow in both piano practice and video gaming. There were no parallel utterances in the participant lived experience descriptions that could be laid side by side to extract an antecedent, environmental factor, physical movement, or bodily sensation that was common to flow in both piano practice and video gaming. This left me with the task of comparing two experiences that might or might not involve flow for these particular participants.

As I had discovered in reviewing the literature that to attempt to measure flow is an imprecise and unsatisfying art, I deliberately avoided creating a checklist against which to compare participants’ accounts to determine which elements of flow they were describing. Instead, I relied on their intuitive grasp of the flow experience based on the description I read in the interviews. It is quite possible that not all of them understood the description in the same way. Nevertheless, I was able to compare their lived experiences, assuming that something like flow was involved, to find elements that were similar and different.

A key choice that informed the analysis was to use the term flow-like experience rather than the more unequivocal flow in referring generally to the participants’ experiences. While my research design assumed that participants would find flow in one or both of the experiences under investigation — practicing the piano and playing video games — this turned out not to be the case. When I read them the flow description from Csikszentmihalyi & Csikszentmihalyi (1998, as cited in Inal & Cagiltay, 2007), only three of the five participants could immediately point to a time when they had felt flow. James said he had felt it playing the piano, Tristan said he had felt it when he was reading, and Michael said he had felt it playing video games. For all participants except
Michael, I went on to ask whether they had experienced something approaching flow when they played video games. Most participants went on to describe an instance of video game play that exhibited some, but perhaps not all, the characteristics of flow. For example, Tristan talked about losing track of time and of becoming absorbed in the challenge of moving through the parts of a narrative game. Colin talked about effortless concentration in playing Monster Hunter 4 Ultimate, referring to himself as being in a “partial state” of flow. I have chosen to label these as flow-like experiences. Similarly, I asked if they had felt anything close to flow in practicing the piano. Only Tristan said he had, and again I consider this to be flow-like experience.

This finding — that not all participants experienced flow — meant that it would not be possible for me to create new phenomenological writing exclusively about the experience of flow in piano practice and video game play. I would be able to write about the experiences but not to focus on the essence of the flow experience. I therefore chose to focus on the differences between piano practice and video game play by comparing and contrasting them. I drew on my own experiences and phenomenological writing as well as the phenomenological writing of others and scholarly work to develop the themes that resonated with me in the data. I chose themes that reflected needs I sensed in the participants.

Transcribing the interviews. The first stage of analyzing the interviews was to listen to the recordings and make transcriptions. I chose to transcribe the entirety of each interview except that I omitted my introduction of myself for the last three interviews since this was essentially the same for all interviews.
It was important for me to listen to each interview entirely because of the music listening portion at the beginning of the interviews with the teens. To listen again carefully to the music they had chosen to prepare helped me to form impressions of them as musicians and as individuals.

The transcribed interviews became the texts from which I extracted themes. The themes were common feelings, experiences, or needs I sensed in the participants that related to their experience of flow or not-flow in piano practice and video game play. The particular dynamic of the oral interview became obscured as I treated the transcripts as though the participants had offered written accounts of their experiences. I extracted the participants’ responses from the transcripts, incorporating necessary details to remind me which questions they were answering, to create a corpus of lived experience descriptions. I labeled the descriptions according to whose utterances they were so that I could always tell whose voice I was reading, and I made sure to indicate whether they were speaking about piano practice or about video games if this detail was not contained in the utterances themselves.

Following the first suggestion of Barritt, Beekman, Bleeker, and Mulderij (1984) in their instructions for Analyzing Phenomenological Descriptions, I transformed portions of these transcripts into accounts of a single lived experience. Because the accounts were gathered through interviews where I interjected questions to prompt the respondents and to clarify their answers, I often had to combine an individual’s answers to a few questions into a free-flowing account of a particular lived experience.
Selecting moments. The second suggestion of Barritt et al. (1984) was to read through the transcripts and look for “moments which seem to be at the center of the event for the person” (p. 6). To start, I printed out all the participants’ answers on paper and cut them up so that each section of text could move freely in space. As I read the pieces of paper, I underlined particular statements that were interesting to me, scribbling in the margins with pencil words to signal what I thought they might be about. For example, Colin said about his video game, “I have a fairly substantial time investment on the line.” This made me wonder about how Colin views time as a resource and why he would talk about investing it in a game. I then looked for ways in which the other participants referred to time and found wide variation. Tristan, for example, described his video gaming experience “almost like time travelling.” And when he talked about a piano piece, Tristan said he “got lost in playing it over and over.” In context, I could see that he was lost in time and not in space. These are just examples of the way the process worked as I made connections between interesting utterances to allow themes to emerge.

I then sifted through these scraps, piling and re-piling them along many different organizing rules. I explored utterances around time, action and motion, death, sense of space, shame and guilt, desire, concentration, technology, and agency. I did additional scholarly reading on several of these topics to get a sense of how they are usually approached. For example, Lakoff and Johnson (1999) helped me see the differences in the ways participants referred to time: time can be a resource, a thing that moves, a thing that stands still while I move around it, a thing I can control, or a thing I cannot control.

I was already moving into Barritt et al.’s (1984) third suggestion, which was to group moments into shared themes while retaining the individual variations on these
themes. I used open coding (Warren & Karner, 2010) to record emergent themes, reflecting van Manen’s (1997) commitment in the hermeneutic interview to remaining “oriented to the substance of the thing being questioned” (p. 98). Van Manen (2007) has asked us to define a theme as meaning, as a simplification, as intransitive, and as a form of capturing a phenomenon. Themes emerged as I, a particular researcher at a particular moment in time, searched for meaning and sense-making in the interviews. As I remained open to new meanings, van Manen (2007) gave me permission to engage in “insightful invention, discovery, [and] disclosure” (p. 88). This was creative work.

**Perceived needs become themes.** The next challenge lay in choosing to focus on themes that would spotlight the key relationships between participants’ flow-like experiences in playing piano and in video gaming. I discovered that the parts of the experience that I enjoy and care about in my own life and practice did not align with what the participants seemed to find important. This was affirming to me because it meant that there would be more to see in the data than a phenomenological nod to my own experience.

As an example, I find the piano as a piece of technology to be completely ready-to-hand. I do not think about how I am sitting and I do not need to spend a lot of energy concentrating on where to move my hands as they fly up and down the keyboard. In contrast, all of the participants articulated a struggle with the physical aspects of piano practice. They had to focus on controlling several body parts at once: hands, feet, and core. For them, the piano was mostly present-at-hand, although three participants described experiencing something like flow when they had completely mastered a piece
of music. Tristan said, “it was like watching someone else play it.” On the other hand, they experienced the controls of their video games as ready-to-hand, where the fingers and thumbs moved automatically to produce complex on-screen motions in ways that I have not mastered. Colin explained: “In gaming I don’t have to focus on controlling quite as much of my body. I only have two fingers and two thumbs to control as opposed to having to control all ten fingers and a foot and my arms. I pretty much relax everything else to focus on game play.” For them, getting killed in a shooting or hunting game happens occasionally, whereas for me it is the only thing. There was a lacuna to be bridged. To find my way into what might be at the center of each participant’s experience, I turned to Nel Noddings’ ideas about the pedagogy of care.

Noddings (2011) described the caring relation as one where both parties participate. My role as the researcher in the caring relation was to listen non-selectively and be receptive to what each participant was going through, to listen to his “expressed need” (p. 8). The role of the participants in the caring relation was to “acknowledge [my] efforts to care” (p. 8). They did this most strikingly by creating the recordings of their piano practice. In reflecting on how he felt making his recording, Colin said it was different that his usual feelings playing the piano because “I was recording for the benefit of someone else.” Tristan described the idea that “someone else would be listening to” his recording as “terrifying,” which demonstrates enormous courage and a social desire to contribute to the research. He explained that his piano teacher and his parents were very keen to have him participate. Tristan was clearly not doing this for himself; his participation was a way of demonstrating care for his teacher, his parents, and the researcher.
I am comforted by Noddings’ assertion that the carer may not be able to respond to the other’s every need; indeed, I will not be responding directly to any of my participants’ needs. Nevertheless, in imagining ways to care for their needs I journey into territory that is phenomenologically relatable. Another important thing to say about their needs is that clearly I have confined my inquiry to their needs as expressed in their conversation about piano practice and video gaming. There is no pretense here that I have come to know these participants widely and deeply as entire beings. However, I believe that some of the themes correspond to needs that extend beyond their development as pianists and gamers.

To select themes I chose to use the tool of empathy, which Slote (2007) describes as central to care ethics. Empathy’s ingredients, as conceived by Noddings (2011) are attention, needs, and response. The interviews, transcription, and this analysis constitute my attention to my participants. I was attentive in the interviews to instances where they were talking to me about what mattered to them. Their needs emerge as the themes of the analysis. The response is the pedagogical turn as I imagine new ways of meeting students’ needs within the phenomenological realizations that emerge.

**Phenomenological writing.** To allow the themes to develop, I needed to create a safe space to articulate them and to play with language that communicates them well enough to elicit the phenomenological nod. I used a two-pronged approach.

In the first series of writings, I chose a theme or a participant utterance and wrote about it, recording my own thoughts and feelings while also delving into scholarly work on the subject. I read articles, watched videos, read fiction, and engaged in real-world
experiences to inform my thinking and writing. This was my way of adding new materials to the lived experience descriptions, which is the fifth suggestion of Barritt et al. (1984). The result of processing this material was part stream-of-consciousness journaling and part scholarly writing. The result of this work is a series of mini-articles on a wide variety of topics, some of which I incorporated into my discussion of the themes that emerged as the analysis chapters of this thesis.

The second exploration followed van Manen’s (1997) process of phenomenological writing and rewriting. This is a reflexive activity whose aim is to recollect, to gather “the kinds of understanding that belong to being” (p. 132). I wrote several phenomenological accounts of my own experiences practicing the piano, which helped me to see how my experience compares with the accounts of my participants’ experiences that I wrote about in the analysis. I played through an entire iPad video game that I had never played before and wrote about the experience immediately afterwards. I also wrote a phenomenological account of playing a first-person shooter game based on the lived experience descriptions of my participants. I worked at learning to stay connected to the body in my writing, always filtering my words through lived experience. I am both comforted and dismayed by van Manen’s statement that there are phenomena of which he has made a life-long study. This is comforting because I realize that learning to write phenomenology is a long process and I cannot be expected to excel at it right away. It is also frustrating because I know that this short research study will not yield the depth of results that might emerge after years of reflecting, experiencing, and writing about my data.

To present the themes that emerged from my analysis I chose first to craft sets of parallel lived experiences of video game play and piano practice based on the
participants’ utterances. I extracted evocative pieces of narrative that most closely resembled flow experience and wove them together to form accounts that sound like they are from one person but are actually a composite of several of the participants. This worked well for the video game experiences, as the accounts from all participants resembled each other in broad strokes. This resemblance allowed me to be confident in the fundamental assumption I chose to make, which was that for all participants video game play was closer to a flow experience, whether or not they declared it to be so. For the accounts of piano practice that are closest to flow, I relied mainly on utterances from Tristan and James, who were both able to tell me about a specific time when they felt like they were in flow, or close to it, during a session of practice at the piano. I present these accounts of flow-like experience in video gaming and piano practice as interwoven narratives, where one paragraph is about video gaming and the next about piano practice. The paragraphs are arranged so that adjacent paragraphs deal with similar experience. In this way, the similarities and differences in the flow-like experiences are clearly seen in the parallel accounts. Three different sets of parallel accounts each correspond to a major theme that emerged from my analysis; I present and elaborate on these three themes in the three chapters that follow. There is naturally some overlap in the accounts, as I drew on slightly different aspects of the same lived experience accounts to craft them.

The chief advantage of using a phenomenological approach in this research was the way it shaped the interviews for collecting the data. By using an open-ended, semi-structured interview process, I was able to gather lived experience descriptions containing a wide variety of themes. As much as I was able to get to know the participants, I used my understanding of their needs to identify themes that reflected their experiences.
Chapter 4: Death and Mistakes

My fingers and thumbs are poised on the controller, tense and ready to react to the next enemy that appears around a corner as I go into the vivid landscape. My avatar’s legs are always moving while my own body’s legs relax. I twine my ankles under my chair.

*My fingers and thumbs are poised over the piano keyboard, relaxed and ready to play the black music notes printed on the white paper. My legs are planted on the floor beneath me, one foot ready to depress the sustain pedal at the right moment.*

My eyes scan the screen, taking in numbers and colours and streams of everything happening all the time, all connected to something I have done. It looks like a slot machine gone completely insane. I do not see anything else in the room around me.

I listen for my teammates’ chatter and for footsteps and explosions. This level is new and I don’t know what to expect.

*My eyes scan the music from left to right and glance down at my hands to help me change positions. The room is dark and I see only the music and the keyboard in front of me under the piano lamp. I listen to the music as my fingers strike the keys. I want it to sound like it does when my teacher demonstrates at my lessons.*

My insides are all balled up; I have put away my body’s needs so I can concentrate on fleeing from an enormous monster. I do not know if I am hungry or thirsty or if I need to use the bathroom.
My insides slowly relax as I play. I came to the piano to escape the frustrations of my school homework. I slip into a state of concentration as Haydn’s Sonata envelopes me.

My head is in a state of hyper-focus, always planning my next move; I cannot stop to think because the game never stops. I am constantly dodging, trying to rack up my score. My adrenalin is rushing. I am constantly in mortal danger. Well, not me, but my avatar. Emotionally I don’t feel in control because it can be really moving. It’s really sad when my friend gets shot and I don’t get the option to redo it. I feel helpless, like I’m dying inside. I wish I could have practiced up to this point so when this enemy comes at me my reflexes kick in and I do exactly the right thing to beat it. When I’m on the brink of death I know I’m probably not doing all that well.

My head is calm. I try not to think too much about the music because I might start to worry about making a mistake. But if I do, I will just stop and do it again a few times, maybe more slowly. It doesn’t really matter. It just takes a second. I am totally in control. I chose to learn this music because I like it. It’s all written out and I know exactly what’s going to happen. When I have learned this whole page I will feel happy, as though I have beaten a level in a game. Then I will start on the next page.

I just turned a corner and got shot. I don’t even know what happened. I am dead. Darn it! I did that. My friends are probably laughing right now. My avatar is bleeding before my eyes and the health meter at the top of the screen is empty. I clench my fists and I jam my toes into the floor. I didn’t want to die because now I have to restart. All I can do is sit
here and chew on the consequences of my mistake. The logic of the game has taken over my thinking and I can’t wait to try again.

*I just played a wrong note. I push it to the side. I am all alone and no one heard me.*

*I scan the music to find a logical point to pick up. I play it over, a little more slowly. Still wrong. Try again. Wrong. Again. Wrong. Again. Aha! That was better.*

*I keep playing until I make the next mistake. My teacher and I both want this piece to be perfect for my exam. My fingers keep moving from section to section, working out my problems in the music.*

**Mistakes in Piano Practice and Video Gaming**

I wrote these intertwined accounts of video game play and individual piano practice based on my participants’ lived experience descriptions. Their flow-like experience is foregrounded when there is an interruption, a mistake.

I asked each of my participants what it felt like when they made a mistake during piano practice. All of them said it was no big deal. They could “just fix it” and carry on. No one else was listening and errors had no consequences. In contrast, in a video game, even when participants were playing alone, the computer was always waiting for mistakes, ready to rain death according to the rules with no mercy. This experience of the unequivocal consequences of mistakes is related to the component of flow that involves clear goals and immediate feedback.

A mistake in video gaming seemed to have much graver consequences than simple failure to meet a goal. My participants talked a lot about death, dying, and being in “mortal danger” (Colin). This is the first expressed need of my participants: to
experience the thrill of danger. They were never in danger of literally dying but it seemed that a large part of their engagement in the games came from the feeling of being under threat. In video games, being killed is a way of signaling that the player has made a mistake. Everything stops. The physical, real-world consequence of the error is that the player is made to wait, to endure a few seconds of boredom while the game resets for another attempt at achieving the goal.

**Mortal Danger and Flow**

To explore more deeply this feeling of mortal danger, I wrote the following account of a personal experience of mortal danger.

When I lived in Swaziland I drove an old Toyota Corolla that had recently had its engine rebuilt. One sunny afternoon my young daughter and I travelled the hour and a half from our house in the north to meet my husband in the capital city, Mbabane. The two-lane road winds through the mountains, with many steep drop-offs and no guardrails. Cars, kombis (passenger vans for hire), busses, pick-up trucks laden with goods or animals, as well as cows and goats on the hoof all share the same lanes. You are usually stuck in second or third gear. If you feel safe driving this road, you have the wrong attitude. The poorly maintained busses are slow, especially as they chug up the hills belching black exhaust.

As we were nearing Mbabane, I was at the head of a long line of traffic right behind a bus going up a hill and around a bend. I judged that I could successfully make a pass, as I could see up ahead to the next curve that there was no oncoming traffic. I accelerated and started to pass. When I was beside the bus I pushed in the
clutch to shift gears and speed up. The clutch seized. I was stuck in second gear. My mind immediately switched from attentive driving mode to hyper-awareness. Stomping on the accelerator, I cut in front of the bus and scanned the shoulder to locate a spot wide enough to pull over. The road was steep and the descent perilous a few feet from my parking spot. Although it felt like I sat there for several minutes considering what to do next, I must have acted almost immediately. I was afraid that if a car in that line of traffic ran into us we would go over the edge. I jumped out of the car, grabbing my purse and my daughter from the backseat. She was clinging to her blanket but her shoes stayed behind. The time between the clutch seizing and me standing next to the road with a toddler on my hip flagging down the next bus was probably less than one minute. It felt like much longer.

Many more things could have gone terribly wrong as I passed that bus. My mind catalogued them all in an instant and I simply reacted. Action and awareness became one, my sense of time was distorted, and I felt entirely in control of my actions even though the outcome was massively uncertain. These are all characteristics of flow.

Moneta (2012) noted that current models for measuring flow cannot handle paradoxes of attention — they do not distinguish between positive flow and being under threat.

So how did my participants’ experience of mortal danger in the virtual world of the video game compare with my actual experience of mortal danger? Is a flow-like experience connected to this experience of danger?

Each participant had a slightly different take on the nature of the danger in video gaming. Sam played video games “online with people who try and kill you and they’re
He was afraid of messing up in front of his online friends, who were people he actually knew in real life. His mistakes had social consequences. For James, the danger was in disappointing himself by not performing as well as he wanted to or as well as he thought he could. “If someone kills me or I fall off a ledge it’s like, ‘okay, I did that’ and I have to wait until I can respond, until I can get back into the game.” Colin was worried about protecting his “fairly substantial time investment” in the game by staying alive; time for him is a precious resource he can choose to spend on gaming. Michael’s view was similar in that wrong choices in a role playing game could have drastic consequences much later in the game that would make much of the intervening play less satisfying in retrospect. Tristan took very much to heart the character deaths he caused in his role-playing gaming; real emotional suffering was the danger against which he guarded himself.

Let us pause for a moment to consider the actual level of risk these perceptions of danger represent. Social embarrassment and emotional pain are real worries for many people, and particularly for adolescents as they are learning to calibrate the proportionality of their responses to stimuli. The feeling of wasting one’s time is another source of danger. Colin and Michael talked about wasting time within the game they were playing, and Tristan, James, and Michael all talked about a fear of wasting a part of their lives playing games rather than doing other activities.

In addition to the social dangers of not living up to expectations of others and themselves, being in danger seems to be a way of feeling time more intensely. In the next section I explore more deeply the participants’ sense of time. Each participant expressed a wish to preserve his time and to use it wisely. James and Michael both expressed regret
over spending time playing video games instead of doing other things. James summarized his feelings:

Usually when I play piano I can get frustrated but I know I’m not wasting my time with it. But then with video games sometimes I’ll just feel like I should be doing something else because I’m not actually really accomplishing anything. And then usually my urge to play games is stronger than play the piano most of the time.

Michael spelled out the consequences of what he termed his “addiction”:

At the end of a month when somebody says, “So, how you been?” I think to myself, “Well, I played 200 hours of Skyrim.” I don’t feel good about it because it’s a waste of time. And if I log that many hours I’m going to have a sore neck, I will have probably eaten a couple of meals I wasn’t intending to eat, I may have been spaced out when interacting with my friends, I may have gone to dinner and been thinking about gaming.

At the same time, James and Michael said they both really enjoyed playing video games. Michael experienced great joy in moments of play with his partner and his friends.

I had the sense that they wanted to confess a sense of shame in their attraction to video games, although they presented the condition as a fact of their lives rather than as something they aspired to change. They were either resigned or content to live with the sense of danger that came with spending time in a way they sometimes perceived to be unwise.
Time

**Time as a measure of engagement.** Throughout the interview process we devoted a lot of attention to time. In the participant information sheets I asked participants to estimate the amount of time they spent practicing the piano and playing video games during the course of normal life. In Table 1 I have summarized the numbered time data from the participant information sheets:

Table 1

*Time Spent in Piano Practice and Video Gaming*

<table>
<thead>
<tr>
<th></th>
<th>Sam</th>
<th>James</th>
<th>Colin</th>
<th>Tristan</th>
<th>Michael (at age 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Years spent studying piano</strong></td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td><strong>Days per week of piano practice</strong></td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Minutes spent per piano practice session</strong></td>
<td>20</td>
<td>20</td>
<td>30</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td><strong>Hours per week practicing piano</strong></td>
<td>2.5</td>
<td>2.5</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Hours per school day playing video games (s)</strong></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Hours per weekend day playing video games (w)</strong></td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td><strong>Hours per week playing video games (s<em>5 + w</em>2)</strong></td>
<td>8</td>
<td>8</td>
<td>11</td>
<td>20</td>
<td>17</td>
</tr>
</tbody>
</table>

Note: Where participants provided a range, I selected the higher number to include in this table. All numbers are self-reported and should be considered to be estimates.

I asked how many years they had studied piano to help me get an idea of the period of time over which they had had the opportunity to develop their practice habits. No one had studied for less than five years, which indicates to me that their habits are probably fairly stable by now. I asked about the length of a piano practice session
because I assumed that longer sessions would be more likely to lead to flow experiences as the participants had the opportunity to either become bored and start manufacturing their own flow-inducing challenges or to stumble upon serendipitous moments of flow during their usual practice routine.

In looking at this practice data and in hearing my participants’ attitudes toward piano practice, I see that my data might have been very different had I chosen to interview pianists who were self-taught or who had stopped taking formal lessons. As I found in my review of the literature, motivation and autonomy play a significant role in experiences of flow. Although my participants all professed autonomy and intrinsic motivation in their piano study, they also expressed a strong desire to please their parents and their teachers. The length of their piano practice sessions is in line with what most piano teachers expect. This means that the amount of time these participants devote to practice reflects social expectations. It may also come out of genuine personal desire, but it is impossible to disentangle the two motivations using the data I have collected.

Comparing the number of hours of piano practice per week with the number of hours of video game play tells the rest of the motivation story. For all participants, video game play is more than double piano practice time. The maximum is a 5:1 ratio. The participants made it clear that there is no social expectation from their parents or teachers for them to play video games. In fact, James, Tristan, and Michael articulated just the opposite — their parents did not understand, did not like them to play video games, and did not think that video games were a good use of time. James said,

My mom doesn’t really like that I play video games. I do spend a lot of time with it that I could be spending doing other stuff that would probably be more worthwhile.
I do it because I’ve been playing games since I was young. It’s a way to pass the time. It feels like a reward after doing school all week.

Sam also saw video game play as a reward: “Practicing piano is more of a chore and then playing video games is kind of a treat for practicing.”

**Moving inside and outside of time.** It is possible that I influenced my participants’ choices for talking about time by asking about the quantity of time spent in various activities on the participant information sheet. However, when I asked the open-ended question about how they perceived the passage of time when they played video games or practiced piano, they all responded in terms of the speed of its motion rather than the total amount of time spent. Tristan said video game play is like time travelling, which implies travel not with time, as in a river, but outside of time, as though one has a choice to jump in and out at various points. Indeed, this seems to be the way the participants used video games. Colin plays on his DS3 on the bus to help pass the time on his ride home from school, seeking relief from paying attention to the activity of and on the bus. James said he played “to pass the time,” as though sitting next to a river and watching it flow past.

Lakoff and Johnson (1999) identified a number of metaphors for time that related to physical objects and being in the world. The participants used a few of these, including *time is a thing that moves* and *time as a resource.* The utterances around *time is a thing that moves* were mostly about time going by quickly as they were engaged in either piano playing or video gaming. This is an expected element of flow-like experience that conforms to Csikszentmihalyi’s (1990) definition of flow. The majority of the
participants’ utterances about time referred to time as a resource. I discuss these further in the section that follows.

What both of these ways of conceptualizing time have in common is that participants seemed to feel that they could control time. If time is flowing past, as in a river, then I have the choice to step into or out of it. I can scoop out some time and keep it in reserve (as in, I will set aside sometime later to meet with you). Indeed, I called one of the categories into which I grouped participants’ utterances Time is something I can control. It includes snippets that are connected to piano practice, such as, “I was taking my time” (Colin), “I can play that at full speed” (Colin), and “I can just stop and do it right over” (James). The utterances connected to video game play include, “I can just play whenever I want” (Tristan), “I can wait it out or go hide for a second” (James), and “you find out that you can reverse time” (Tristan). I had the impression that one of the needs expressed by these participants was a need to control time. They expressed autonomy in being able to choose how they used their time. They could jump into the river and ride its current, they could step in and out at will, and, in gaming, they could even make it flow backwards. This is power.

Conversely, I also created a category called Time is something I cannot control. It makes sense that people who wish to control time would express surprise or dismay at their inability to do so consistently. The participants’ expressions about not controlling time mainly reflect Csikszentmihalyi’s (1990) flow characteristic of losing track of time. Utterances about piano practice included, “I was surprised because I didn’t think I’d played that much for that long” (James), “I just kind of got lost in playing it over and over and it went on for maybe 10 or 15, 20 minutes of me just playing the same piece”
(Tristan), and “It was fast. It didn’t feel like 10 minutes” (Sam). About video gaming, participants said, “I have to wait until I can respond, until I can get back into the game” (James), “If the story’s going and I’m trying to keep up with it, I’ll kind of lose track of time” (Tristan), and “What have I missed because I was gaming?” (Michael). In both piano and gaming, participants expressed a sense of being carried along, or stuck against their will, in the river of time.

**Time as a resource.** James spoke of video games as being a waste of time, as though he had so much time to spend that he might as well toss bits of time into the air like a millionaire’s dollar bills. Does he really feel so rich in time? He did not seem happy about wasting time. Rather, he felt judged by his mother for doing so. For Tristan, to spend his time gaming was an investment in excitement and adventure, a parallel to actual world travel. Colin conceptualized time very literally as a resource to invest. What dividends does he intend to reap from his investment? He reported that his chosen game was basically infinite, with no real point of completion, or goal, toward which he was working. With piano, he definitely had a sense of the worthiness of his time investment: “it gives me a lot of knowledge and capabilities I would not otherwise have.”

For these participants, the most annoying thing about dying in a video game is that it wastes time — they have to wait for the game to reset so they can try again. In piano, mistakes do not waste time because they immediately replay the section and carry on. Time is a precious resource.

I wondered more about the effect of the boredom and waiting that happens between plays of a video game. It seems as though this waiting should interrupt or impede the
onset of flow experiences. Piano practice, where there is no waiting, ought to engage the player more continuously and lead to flow. But these are not the experiences the participants described. I went searching for possible reasons why the waiting caused by video game death would enhance rather than destroy the gaming experience.

**Death as a marker of skill: forced rest breaks, learning, and flow.** The way video games force the player, through death, to stop and “chew on what just happened” has been shown to be an effective tool for motor learning. Bock, Thomas, and Grigorova (2005) studied the effect of rest breaks on human sensorimotor adaptation. While it is obvious that increasing the amount of practice time improves motor coordination on a specific task, Bock, Thomas, and Grigorova wanted to study the effect of enforced pauses between repetitions on the retention of the motor learning over the longer term. They found that longer breaks (greater than one second) greatly improved participants’ adaptation to a task, as they had time for recalibration of their sensory-to-motor transformation rules. Breaks also increased retention of the task on subsequent days. The idea seems to be that the breaks allow the brain to transfer the learning to long-term memory.

Applying this knowledge to my participants, it seems that the enforced breaks that happen during death in video games might help players gain skill more quickly so that they can rise to increasing challenges in the game and find flow. By contrast, the lack of enforced breaks between repetitions following mistakes in piano practice could mean that their skill increases more slowly.

In my own piano teaching, I employ a strategy where I ask a student to repeat a motor action several times in succession. The only break is for me to say “again.” After
several successful repetitions, I ask the student to “wave to your mom,” who is usually sitting on the sofa in the corner of the studio observing the lesson. The wave serves to distract the body and reset the brain. I then ask the student to repeat the action again and we celebrate when it is successful, which it usually is. In addition to allowing the brain and body to take an enforced break from the action, waving to a family member introduces a social aspect to the learning.

Enforcing body breaks between repetitions during learning and connecting the activity to an observer are both techniques that mirror video game play. Death is the enforced break in a game, while the reality that the game is always watching to see if you got it right is the social aspect. For some players, like Sam, who plays online with his friends, there is yet another social observation layer as his friends can see all his mistakes and they have to wait for him when he gets killed.

**Death as a marker of time.** I wondered why all my participants talked about death in video gaming. Was it because each death marked off a section of time they had spent (or wasted) playing the game? Each death brings the player to a decision point about whether to continue playing or to pack it in. Each decision to continue playing is like throwing another coin of time into a slot machine. The results are uncertain and probably not in the player’s favour, but the colours are so bright, the sounds so compelling, and the coin slot so ready-to-hand that it is very easy to keep playing.

In contrast, each mistake during piano practice, while frustrating in the moment, is an invitation to do something worthwhile. James talked about feeling in control during his piano practice; if he made a mistake, he knew what to do to fix it. He said that piano was a useful real-world skill, unlike video gaming. Similarly, Michael was emphatic that
playing the piano is totally different from gaming because it is connected to something physical, to playing notes on the piano.

**The Physical**

All of the participants expressed their conviction that learning to play the piano is a useful real-world skill that will make them better people. Here is another expressed need that is common to all the participants. Outwardly, there are similarities between the physicality of video gaming and of piano practice. Both involve fine motor control with the hands in coordination with a visual stimulus. Both require a certain minimum amount of mental attention — it is often difficult to, say, carry on a conversation while one is playing. Both usually involve sound, although many video games can be played, with no diminishment of enjoyment, with the sound turned off. Michael, who is a music composer, spoke about choosing to turn the sound on or off in various video games based on the quality of the music and effects. If the music was highly repetitive or poorly-composed, his enjoyment of the game was higher with the music turned off. He also spoke of choosing, in certain games, to set the relative loudness of the music and the sound effects according to his preference. This suggests that the game programmers’ idea of the ideal soundscape does not always match what induces the greatest flow-like experience in the players. Colin said that he played Monster Hunter on the bus with the sound off so as not to annoy his fellow passengers, yet he said he experienced flow-like experience in this visual-only environment.

I now return to the flow accounts with which I opened this chapter to reflect on the physical realities of flow in video gaming and piano practice.
**Ready-to-hand, present-at-hand.** The most attention-grabbing part of the body of a person engaged in playing either a video game or the piano is the hands and fingers. Both activities involve careful fine motor control using a highly specialized interface. In playing the piano, participants talked about controlling their finger movements, how their fingers did not always move as fast as they wanted them to, and how it required a lot of concentration to shift their arms to different positions on the keyboard. Much of the time the piano was present-at-hand, where they did not feel at one with the instrument or the music. Their attention was consumed with controlling the movements of their bodies. In contrast, they seemed to experience the controls for video games as more ready-to-hand; hardly any mental bandwidth was required to keep track of what their fingers were doing. They operated mainly by reflex. The finger movements required were simple enough that they could enact fast repeated motions with less loss of accuracy than in playing the piano. This left more parts of their attention available to focus on the game itself rather than on the physical controls.

At the other end of the body, the participants’ legs were totally extraneous to their actions playing video games. Tristan played hunched over to peer at his computer monitor, James sat forward with his elbows on his knees, Sam was ensconced cross-legged on a sofa, Colin was scrunched up in his seat on the school bus, and Michael might be reclined practically horizontal in an easy chair. For the piano, Michael noted that it “involves everything from the waist up plus your feet.” They all had to sit squarely on a piano bench to play. If the feet were not required for the pedals they might be crossed at the ankles under the bench, but they always serve to support the body.
The language participants used to talk about their engagement in the two activities—piano practice and video gaming—shows the extent to which they found the equipment to be either ready-to-hand or present-at-hand.

A couple of the participants described their piano practice as something where they would “just go” and do. In Wagner’s (2008) study of secondary mathematics students, he investigated with them the meaning of using the word “just” to describe a mathematical action. One finding was that to say “just go” suggests fluency; the action is routine and does not need to be foregrounded. I believe this is how my participants used “just go.” James talked about how he dealt with mistakes during his piano practice: “I can still just go and fix it.” Tristan talked about task switching from Skyping with friends to doing his piano practice: “And I’ll just go on my electronic one and do that and they’ll just kind of listen to me.” These statements suggest that James and Tristan experienced the piano as ready-to-hand.

In the same way, the way the participants talked about video gaming suggested that games are ready-to-hand. They described themselves as being “in” a game and they spoke as though they were positioned next to a dying friend (Tristan), fleeing from an enormous monster (Colin), or coming around a corner to find no one there (James). They did not mention their physical actions on the game controllers, keyboards, and computer mice that put them into these games. They would “just go” into the games. The relative ease of the physical controls made the experience more immersive.

In contrast, Colin experienced the piano very much as present-at-hand when he was learning the Aria from Final Fantasy. Speaking about the contrast in how in control he felt physically playing Monster Hunter, he said, “I don’t have to focus on controlling...
quite as much of my body. I only have two fingers and two thumbs to control as opposed to having to control all ten fingers and a foot and my arms. I pretty much relax everything else to focus on game play. “When he played the piano, Colin concentrated on his ten fingers and his foot on the pedal and his arms moving up and down the keyboard to position his hands in different places at different times. There was a lot going on and so there was no “just go” for him at the piano. But in playing Monster Hunter, he was able to coordinate his two fingers and two thumbs to move around on his little screen to the extent that he became absorbed in monster hunting instead of paying attention to his body.

**Conclusion**

Experiencing flow in video game play involves a sensation of danger that is absent in piano practice. To the extent that my participants’ relationships with adults who cared about their piano learning were safe, they experienced little risk in their piano practice. Although the physical challenges of piano practice are greater, they usually felt in control because they could control time by stopping and starting at any moment. However, some of them experienced moments of flow when they were carried along by time as though their control of it had temporarily ceased. In video gaming, the physical challenges were fewer but their ability to control time was limited by the way the games were programmed. They experienced risk and danger both in the context of the story of the game but also in the social relationships surrounding their gaming and in the incongruity between the actual and the ideal ways they wished to use their time.
Chapter 5: Work and Play

Someone has written a story, someone has created a world. The video game transports me outside my body. The storyline takes my imagination completely to another world.

Someone has written this piece that I really like. My goal is to work on learning this bit and I am super into it. Time doesn’t even feel like anything. It’s like it’s not there. I kind of zone out and get lost in playing. I get halfway through the piece and then realize, oh yeah, I’m playing. It’s like watching someone else play it. I feel powerful when I play this music.

I am with the person who is my friend in the game and it’s this really sad part. She’s going to jump off the roof or not. She’s going to die. I feel so sad for her. I can either say the right things and save her or say the wrong things and she jumps. I have to choose from the list of options of what to say. I say the right things and I save her. It feels great because she’s an important character. She’s been my friend since the beginning.

When I play a page of music successfully, when I finally do something right, it’s kind of like finally beating a video game level. I have finally done what I wanted to do the whole time but I just kept messing up or rewinding. I don’t want to mess up for my piano teacher because I will feel bad and know that she isn’t happy with me. It’s something that I signed up for and I’m supposed to be learning. I want to get it over with and finish it so I can move on to a new piece.

Being in the game is almost like time travelling. Maybe a couple of hours will go by but it will feel like ten minutes. Filling time is why I started to play but the challenge is why I keep doing it. I’m very concentrated; nothing will snap me out of it. I never know what is
going to happen next; it’s not all written out. It is a steady stream of part after part after part, all moving on the screen in front of me.

*When I play piano I can get frustrated but I know I’m not wasting my time with it. I’m working toward a goal of doing my exam at the end of the year. Piano is useful in the real world. The music takes me to a higher state of thinking and feeling but it’s not a substitute world. It’s an enhancement to this world. Other stimuli are still getting in, like when my sisters chase the dog past me into the kitchen. But I’m relaxed here playing piano because it’s a good relief from the frustrations of my schoolwork. The piano music is all written out and I know exactly what’s going to happen. I just need to get this one part good and then I can move on and it will sound fine.*

I can sink down further and further in my chair until I’m reclining … I could be hunched over like Stephen Hawking and still play.

*I am using everything from the waist up plus my feet — most of me. I have to be aware of it all the time, my big motions over a wide range.*

**Being Transported**

Someone. Another human. Although my participants engaged in solitary piano practice and video game play, the language they used to describe their experience revealed a longing for connection with others. If a person is transported by a video game, the game begins with this need: “take me with you.” The programmers who created the game are the ones with whom the player is entering into a temporary relationship that is contained within the rules and parameters of the game. The entrance into flow feels
seamless, as the physical and attentional demands of the activity have been calibrated carefully.

A piano student who engages in practice also enters into a web of relationships. The composer and the teacher are the authors of the activity, while the student follows in their footsteps. But the music does not take and lead the player by the hand in the same way that the video game carries a person along. There are fewer unknowns and it is the student’s task to find a way into flow by developing skill to meet the challenges the teacher has helped establish.

The need to be transported is the second theme that emerged from the interview data. But there are key differences between the transportation the participants felt in video gaming and in the way they might occasionally be carried away in piano practice. Just as riding the bus to work might feel very different than a trip to an amusement park even if the journey uses the same vehicle and takes the same amount of time, participants were satisfied with less flow in piano practice because they were confident that they were working toward a worthy real-world goal.

**Practice and Play**

I typically use the same word to refer to making music on an instrument and engaging in video gaming — play. In my thinking, talking with participants, and writing about what we do on the piano I have used play and practice interchangeably. As I stated in defining my research question, the type of piano playing I am talking about here is individual practice in a relatively private, low-pressure setting. Playing the piano in a performance setting is a completely different activity; more than one participant spoke
about practice and performance as separate scenarios. Calling piano activity practice rather than play highlights the aspect of challenge alongside skill, which are the two key ingredients in flow. If I am practicing, the implication is that I am meeting a challenge to improve my playing. Music is ready to perform when all the technical and stylistic challenges of a piece have already been dealt with; the challenges in performance lie in the realm of concentration and control.

The distinction between practice and play became more salient as I engaged with the data. When I asked participants how it felt when they made a mistake when they were playing piano, they all replied that it was no big deal. In practice, they all said they could just go back and fix it. It is interesting that no one replied, “Who cares? No one is listening anyway. I’m just playing.” They all cared about playing the music correctly according to what was written on the page and what they and their teacher expected to hear. All the participants’ utterances around mistakes and piano practice implied that they were following a fixed set of expectations and rules that had real-world consequences for violation. The consequences included feeling disappointed with oneself or letting down the teacher, who would expect to hear progress at the next lesson. Other consequences included not being well prepared for a performance or an exam.

None of the participants reported entering flow during a session of pure improvisation at the piano. The two who reported flow or flow-like experiences at the piano both said it happened when they were repeating a piece of music they knew very well, as if on autopilot. This led me to wonder whether the word play is inappropriate to describe how the participants interact with the piano, especially in comparison to their video game play.
Huizinga (1944) laid out necessary conditions for an activity to be considered play:

1) Play is voluntary

2) Play involves “stepping out of ‘real’ life into a temporary sphere of activity with a disposition all of its own” (p. 8)

3) Play has limits in time and place; it begins and ends.

4) Play creates order and perfection within its sphere

5) Play produces social groupings (e.g., clubs and teams)

As he considered what music and play have in common, Huizinga stated that music has no “necessity or utility, duty or truth” (p. 158). Music has its own forms and values that “transcend logical ideas[,]… the visible and the tangible” (p. 158). Music helps us to feel ritual, which is limited in time and place.

Both Plato and Aristotle took pains to explain how music is much more than simple παιδικά, or child’s play. While it has elements of pure play, Aristotle considered music a component of διατυπωμένη, or “mental recreation” (Huizinga, 1944, p. 160). The ancients included music in paedeia, or education, because it enabled men (yes, men, because they were the only ones who were afforded leisure in that time) to make the most of their non-working lives. Another popular Greek view was that music’s ethical and educative value lay in its ability to arouse particular sentiments like enthusiasm, courage, or contemplation. Plato spoke of the musician as being a mimes, or imitator, who is not necessarily aware of the ethical power of his music as he performs merely for play and not as serious work.
I think my participants took their music making much more seriously than Plato’s *mimetes*. For them, piano practice was a way to develop real-world skills. They did not talk about using music to evoke particular feelings. Their feelings emerged much more strongly in their descriptions of their video game play. Sam calmly said that playing piano was his “happy place” where mistakes did not bother him. In contrast, he exclaimed, “Darn it!” when I asked how it felt when he got killed in a video game. Well-composed music always involves struggle. The harmonies build tension and then resolve, creating a feeling of release. Sam must have been experiencing this struggle as he practiced his piano pieces, yet it did not reach out and grab him in the same way that his gaming experience did.

**Music Making as Work**

Csikszentmihalyi (1990) reflected on the blurred lines between music as play and as work: “Even when children *are* taught music, the usual problem often arises: too much emphasis is placed on how they perform, and too little on what they experience” (p. 112). The idea is that the more music becomes like work, the less likely it is that children will experience flow in music making. Csikszentmihalyi distinguished between hearing and listening. Listening, he wrote, involves sensory, analogic, and analytic attention. In my experience, flow in playing the piano uses these same three modes of attention. Sensory attention is taking pleasure in the sounds and in the feeling of one’s body in creating the music. Analogic attention is allowing oneself to feel emotions and experience mental imagery related to the sound. Analytic attention focuses on the structure of the music as well as evaluating the performance against an ideal or against another performer or
instance of performance.

My participants touched on all three of these aspects of listening during their flow-like experiences playing the piano. Tristan described the sensation as “like watching someone else play it,” which appears to be a subtraction of sensory data rather than an actual sensation. He said he “felt powerful,” which reflects the analogic power of the music to evoke emotion. James spoke about “working out problems” in a piano piece during flow, which points to an ongoing analysis of how his playing compared with how he wanted it to sound.

The way the participants in this research positioned their piano practice next to their video gaming shows that they associated piano more strongly with work than with play. Although they mostly claimed their practice was voluntary, on the continuum of voluntariness it was closer to obligation than to complete freedom. Piano practice was work because they were learning a real-world skill; they did not articulate any skills learned in video game play that they thought would be useful outside of the game world. This is another way in which video games transported them completely outside of reality. Piano practice was also work because they were striving toward social goals that had real consequences, such as taking piano exams and playing in recitals and music festivals.

Both James and Tristan, who are the only participants who spoke in any depth about flow or flow-like experiences in piano practice, both had these experiences playing music that they had chosen and worked on learning with their piano teachers. They did not report flow in improvisation or in playing music they had chosen to learn independently. While they took place in a work-like setting, these flow experiences came
at the end of a sustained period of work that likely did not involve flow. They did not occur out of thin air, but as a direct consequence of many hours of practice.

Reflecting on my own experience of play as a young person, my view was the reverse of what these participants articulated. Outside of piano practice, my play life was oriented toward practicing skills I would need in the real world. I nurtured my dolls, built structures with Lego, messed around in the kitchen combining ingredients that might be good to eat together, and rode my bike and the bus all over the city to explore my environment. Playing the piano took me to a pretend world where physical survival took a backseat to the life of the mind and the emotions. In both piano play and other play I felt transported, but the piano took me outside of the normal rules of real life into an invented universe of sound. For the participants in my research, the opposite seemed to be true. They found the video game world to be wholly invented, while music was more closely connected to the real world.

Caillois (1961) wrote about the contamination of play by real-world concerns. While this happens most often with professional athletes or performers, is it possible that social expectation is a source of ἀγών, or struggle, that positions piano study as work and not play. Indeed, Michael was adamant in positioning piano as a real-world activity, while he placed video gaming firmly in the realm of the invented. The most appealing aspect of gaming for him was to be transported into another world that felt limitless and that contained its own consistent set of rules that were different from real-world rules. When I asked him how this game world compares with the arcane knowledge musicians require to perform music, he insisted that the two are completely different because
playing music is a real activity where the knowledge serves to tell the player how to move fingers on the keys, for example.

This is interesting to me because in video game play players also take in special information that tells them how to move their fingers on a keyboard or a controller to produce an effect that is ephemeral, like the sound of music that does not endure after it is heard. What is the exact difference between the two activities? This is where ἀγών comes in. For all the participants, their piano study had real-world connections and aims beyond the purely ludic. They could more easily find a challenge-skill balance in video gaming because they always had the option to stop playing a game that did not provide them with flow. By contrast, the social expectations associated with piano study made them continue to work at it in the absence of flow as they accepted the reality of high challenge in the face of lower skill.

There is nothing in the descriptions of flow that requires it to take place during either play or work. Csikszentmihalyi’s research uncovered flow experience in a wide range of activities. For example, a person with a boring job might enter flow by challenging herself to meet self-selected goals throughout the day. Flow comes from an internal sense of challenge-skill balance where there are clear goals and feedback.

It is the feedback that is most notably different between the video gaming experience and that of practicing the piano. Michael articulated this when he compared grinding (performing repetitive tasks that can be boring) in certain types of video games with drilling passages of piano music:

If you grind for an hour, you’ll get some levels and you’ll get some gold. Every time you kill the bandits to get the cotton there are sounds going off, reward
Even if you’re just going in a circle doing the same thing over and over, you’re constantly being rewarded in a way that if you’re practicing a scale passage in a sonata is much harder to see. So many of my piano students come to a lesson and say, ‘I worked on this all week. It hasn’t gone anywhere.’ And they really believe that. Sometimes they’re right, but usually after a week I can say, ‘No, that’s way better than it was. Don’t you remember?’ But in the actual doing, in half an hour of doing a passage over and over, it’s very hard to feel the real satisfaction from that, to see. And your reward centers are not lit up. There’s no ringing bells and flashes of colour. Video games constantly give you that sort of feedback in a way that piano doesn’t at all.

The rules in video gaming are clearly and immediately enforced. The player is constantly being evaluated and no deviations are permitted from the pre-programmed set of possible actions. In contrast, piano practice has no rules and no immediate feedback other than a person’s self-critique. It is entirely self-directed, such that only someone with an autotelic personality would gamify the experience by establishing micro-goals and rewarding him- or herself for reaching them. A piano teacher’s job involves teaching students to set and reach these personal goals during individual practice. This is exactly where the temptation lies for the gamification of education. By establishing immediate rewards, games encourage students to persevere in working through smaller chunks of learning to reach larger goals. And yet my participants’ lived experiences reveal that they do not consider piano practice to be consistent with game play.
The Visual: Play is Something You can See

In video game play the immediate rewards are always visual. They may also be auditory and/or tactile, but there is always something exciting to see. In piano practice, the quality of feedback a student receives is directly proportional to the student’s ability to audiate, or hear the music internally to compare it with the sound coming out of the instrument. Depending on the tempo of the music, there may only be a split second for the pianist to judge whether a mistake has occurred. In contrast, a video game not only keeps track of a player’s every move, relieving the player of using cognitive space for detailed self-evaluation, but it also provides feedback that is both immediate and unmissable.

Looking back to Michael’s description of the difference between the feedback in video gaming and in piano practice in the preceding section, the key utterance in his remarks is “to see.” The visual is a key factor that transports the gamer. Although Colin played Monster Hunter on the bus with the sound off so he would not disturb his seatmates, he still felt the intensity of his battle with the monsters as he peered into the little screen on his handheld gaming device. James compared his concentration level playing a video game to his concentration playing the piano:

I can get better concentration more frequently in Destiny than with piano just because I find it easier to get immersed in that. There’s the visual aspect and then the controller and then there’s sounds as well as opposed to with piano where I’m playing it and I can hear it. The music on the page is not moving. It’s just on the sheet of paper but then with the game it’s moving and there’s all this stuff going on.
There’s more movement and other people doing things. I can see that and that’s what makes the difference.

Seeing is again the salient sense at play.

**The Visual: Movement that Transports**

In *Video Games, Emotion and the Six Senses* Shinkle (2008) noted that playing a video game differs from viewing an image that is either still or moving by involving “kinaesthetic, proprioceptive and vestibular senses as well” (p. 908). The meaning players create and the emotion they experience through the narrative of the game are influenced by sight, sound, and motor actions. The range of physical actions to which the participants in my research had access in their video game play was severely limited in comparison with other types of gaming and with piano playing. Shinkle claimed “standard controllers offer limited opportunity for expressing or mobilizing the corporeal dimensions of emotion in a useful way” (p. 908). Facial and body movements not only reflect our emotions, but they can also create them. This happens through our sense of proprioception. Proprioceptive receptors are found all over the far reaches of our bodies. Their job is to relay positional, movement, and muscle event information to the brain. They stimulate the hypothalamus, whose job it is to influence emotional, hormonal, and autonomic drives. In this way altering one’s facial expression or posture can lead to a change in emotional state.

The participants in my research reported controlling their video games using only their hands. Sometimes both hands operated in a mirror image position where each hand controlled different buttons on a controller or hand-held gaming device. Computer
gamers used one hand on the mouse with its movements and buttons and the other hand on a limited set of keys on the computer keyboard. Despite the very small range of movements they were able to make, they experienced intense emotions during gaming.

Sam said, “usually I’m all scrunched up because I’m tense playing.” Tristan said he was “normally loose, unless it’s something really intense and I need to move around a lot and I’m kind of almost crushing the keys. Then my fingers just start to hurt or my knuckles or something. And then I’ll need to kind of shake it out.”

Colin’s Monster Hunter game play mainly involved fast, task-switching movements with his thumbs. He articulated a much larger struggle to control his body’s movements when he practiced the *Aria di Mezzo Carattere* on the piano. And yet he characterized his concentration as being inverse to his body’s effort:

I’m trying harder to concentrate when playing the *Aria*. I’m functionally concentrating harder on Monster Hunter. Without focusing on the concentration I end up being more concentrated. By concentrating on my concentration I am diverting concentration away from the thing that I’m supposed to be concentrating on.

In this way Colin articulates the concept of effortless attention that he experiences playing video games.

If body awareness and range of movement is so much less with video games than in playing the piano, how did this movement produce such intense emotional response and engagement in video gaming for my participants? The purpose of Shinkle’s work on proprioception was to point to ways and reasons for the gaming industry to involve more of the body to increase the immersive experience of gaming. But what if we turn her
work around and look at it another way? If video game play without proprioceptive inputs is already more immersive than playing the piano, with its high degree of proprioception, this suggests that the strength of the visual and auditory inputs in game play more than compensate for the lack of physical stimulus.

In his 1984 novel *Neuromancer*, in which he coined the term *cyberspace*, William Gibson’s protagonist, Case, has a choice of two modes of corporeal interaction with his computer. Simstim transmits the physical sensations of one person to another, which is one way of travelling outside of oneself across time and space. But Case eschews simstim in favour of going directly into the matrix, where his brain visualizes data and interacts with it in simulated space — cyberspace. “Cowboys didn't get into simstim, he thought, because it was basically a meat toy. He knew … that the cyberspace matrix was basically a drastic simplification of the human sensorium, at least in terms of presentation, but the simstim itself struck him as a gratuitous multiplication of flesh input.” (p. 55). Gibson’s idea of bypassing pleasures meant for meat (the body) in favour of stimulation for the mind helps me understand the way my participants talked about their spatial orientation during video game play.

Tristan described his physical actions playing computer games: “For most computer games you’ll use the mouse to look around and you’ll use the keyboard to actually walk.” Why did he say “actually”? We both knew his legs were not moving when he was fully engaged in gaming because he had already described them as being “crossed underneath the chair.” Similarly, Michael described what it is like to play a shooter game: “You’re constantly dodging bullets, literally.” Why “literally”? His virtual physical actions in a game are laden with emotion, as he explains having to “schlepp
from the back corner of a field to the action spot,” an active but boring experience. Sam recounted the last level of a game: “The big boss just snakes around and tries to hit you and you have a sword and a shield. And you have to dodge around him. And when he’s still moving you have to shoot his nose with an arrow five times while bats are flying around you.” The participants’ choice of words reveals the extent to which their game play felt like reality. Like Gibson’s Case, Michael described himself as getting “into the game-space. And so I make decisions, I do things. For example, I kill a lot more people in games than I ever would in normal life.” No kidding. Similarly, Tristan described the combination of visual and auditory input that “puts me in the game … I don’t really notice anything around me. It’s just what’s on the screen and that’s it.” Being transported is more compelling than the physical feelings of the body.

Conclusion

The physical complexity, social expectation, and perceived real-world usefulness of learning piano made piano practice much more like work and less like play for my participants. They did not expect to experience flow in piano practice. The highly visual world of video games transported them more completely, providing an escape from real life where their absorption was not diminished by the fact that their bodies were less involved than in piano practice. The intensity of the moving images in video game play took the place of the movements of the body that would otherwise be part of a flow experience.
Chapter 6: Limitlessness and the Sublime

I wanted to keep wandering. The game is a steady stream of part after part after part. The programmers fill every nook and cranny with little stories. Some of them are just visual. Almost everything in the game you can pick up and move. There’s a sense of infinite possibilities. There are hundreds, thousands of computer terminals from 200 years back. You log into these rusty old terminals and read people’s diaries or the building’s office secretary’s notes: “I keep forgetting everybody’s coffee order, so here’s what it is. Mr. Thompson wants a cappuccino two sugars…” That somebody bothered to write that, to put it on a computer terminal in the corner of an office in one of hundreds if not thousands of buildings in the game. And there’s no repetition. That’s not a piece of text that is replicated. It’s in that one office because that’s the story of that spot.

_In piano it’s all written out and I know exactly what’s going to happen. So I just need to get that one part good and then I can move on and it will sound fine._

I can go through and do all the missions but I can replay them and then I can still do the multiplayer. After I beat the main story I can still play and it’s more challenging. I usually get better rewards for doing those, like armour or weapons. The total number of possibilities is probably infinite because the outcome of the game depends on what I did in that town, what I said to that person, whether I won at that brawl or at that game of cards.

_That song’s not really finished yet but whenever I could play two of the three pages I was really happy because I’d been learning it for a while. Doing those pages was like beating a chapter in a game. So when I beat that part, it’s just like, “Oh, I can_
move onto the next now.” It’s a feeling of accomplishment. I have to do a lot of work to make a Beethoven Sonata really be something special.

The Mind Transported

These accounts reveal more about the nature of the alternate world to which the participants were transported by their video game play. They point to another need I perceived — to experience limitlessness and the sublime. There was a marked difference between how they described their piano music and how they spoke about the worlds of video gaming. They experienced piano as a much more finite activity. Certainly the relatively limited amount of time they spent practicing, detailed in Table 1 in Chapter 4, reflects this finiteness.

I found it impossible to write the above accounts from the point of view of the body, as phenomenology asks us to do. These important distinctions between video game play and piano practice lie in the participants’ conception of themselves in relation to the technology they are using. For video gaming, the digital technology exists and has been created separately from the gamers; they cannot perceive or know its entirety. Nevertheless, they feel seamlessly connected to it when they play. In piano practice, the music on the page and the piano itself are technologies that are concrete and completely knowable through observation.

In this chapter I discuss the effect of perceived limitlessness and finiteness on the participants’ flow-like experiences. I connect their experience of infinite possibilities in video gaming to the concept of the technological sublime. I also reflect on the
relationship between the participants and digital technology in relation to their piano practice.

**Limitlessness**

Video games give a sense of limitless possibilities because the programming is obscured for the player. It is not the literal limitlessness they experience, but the uncertainty of not knowing where the limits actually are, the impression of infinity, that invites them into flow. This may relate to the *paradox of control* (Csikszentmihalyi, 1990) component of the flow experience, where the player feels in control even though there is uncertainty about the outcome of the activity. It also connects to *clear goals and feedback* by presenting the player with precisely the right amount of input to accomplish a task successfully, while the player knows that the next task and the one after that, and the one after that, are all queued up for the opportune moment.

Seeing the piano music on the page, one can take in its entirety in a glance. There is no uncertainty about when it will end. The uncertainty comes in one’s physical ability to create the sounds one hears in one’s head.

Several of the participants talked about the sections of music as being similar to the stages of a game. In particular, Tristan equated learning one page of music with completing a chapter of a game. This is interesting because the pagination of music does not always correspond with logical breaking points in the music. Perhaps Tristan’s sheet music did have logical breaks at the page turns. Nevertheless, the visual structure of the notes on the page seemed to be an important feature. They felt a sense of achieving a goal when they had played all the music they could see at a glance. Then they turned the page
and began to work toward a new goal. This is certainly the way many of us learn new music, by dividing it into manageable sections. And it is possible that when Tristan spoke of finishing a page he did not mean a literal page, but a section that finished near a page break.

Another curious feature of Tristan’s attitude toward learning music is that once he considers a piece to have been learned his next step is to “move on to the next now.” He could have said, “Oh, I can play this now whenever I want and enjoy the sound of the music.” I am thinking about a builder who has worked hard to construct a house for her family to live in. When the structure is complete, we expect her to move in and enjoy the space she has created rather than standing for a minute to admire the house before moving on to begin building a new one. Yet moving on to the next is a very common human compulsion upon completing a project. It is the process, more than the product, that gives pleasure and a sense of accomplishment. This too points to a yearning for the limitless, to travel ever onward, just as one does during video gaming.

Indeed, Tristan’s “move on to the next now” approach mirrors his behaviour in video game play, which is designed to move the player ever forward through a virtual space or through a storyline. Michael articulated this well in his description of the seemingly endless video game world to be explored that forms the first paragraph of this chapter.

While the participants talked about the incremental steps in the process of learning a piece of music, which Tristan conceived of like chapters in a game, they were also very interested in the finished product of their piano learning. James and Michael spoke about preparing to perform in the music festival or for an exam. Sam and Tristan talked about
their piano teachers’ periodic recitals with their students. Tristan archived his finished works by recording them digitally to share with friends. In contrast to their sense of the endlessness of video game play, their work at the piano had a definite end point.

The product of the participants’ piano learning always had social value. The most immediate relationship involved was with their piano teachers. Tristan said that he knew his teacher would be disappointed if he did not show progress in his piano learning. All the participants talked about their process of choosing music together with their teachers, who then held them accountable for learning to play it. A public performance, like a recital or an exam, always positions the pianist in relationship to teachers, peers, and family members. Tristan’s recordings positioned him in a particular way among his friends. He recalled to me how he sometimes practices on the digital piano in his bedroom while he is on a Skype call with friends. He said he would only do this with closer friends: “they know I’ve been doing it for a while and they know I have to practice.”

The orbit of the participants’ social relationships helped to delimit the scope of their piano practice by tying their goals to opportunities to share their learning in a close-by location. One does not physically travel to another galaxy to perform a work of Bach. In contrast, the product of their video game play was not limited in space because the relationships involved were mostly between the players and the technology, which transcends physical space by creating infinite worlds for the mind.
The Sublime

Shinkle (2010) has encapsulated beautifully the sense of limitless possibilities afforded by digital environments in terms of the sublime. In the Romantic European tradition, a person’s experience of the sublime took place exclusively in nature, where one felt small and insignificant in comparison with the wonders of the world. Kant in 1790 named two aspects of the sublime experience: the mathematical and the dynamical. The mathematical relates to size and the dynamical relates to might. “The mathematical sublime dealt with the feeling that resulted when the imagination ran up against the incomprehensibly large in nature” (Shinkle, 2010, para. 6). Colin described his game as “hunting very very large monsters.” In addition to the incomprehensibly large number of game outcomes captured in the account at the beginning of this chapter is this more concrete sense of being up against an unimaginably large enemy. Monsters and enemies are creatures, which could be argued to belong in the category of the “natural world” even when they have been generated by a computer.

The notion of the technological sublime incorporates these digital monsters, as cultural historian David Nye has written that with the settling of America by Europeans they came to view human technological achievements as equal with nature in their capacity to produce an experience of the sublime. A dam or a railway bridge could be admired just like as a mountain or a waterfall. In the same way, a video game is a complex human achievement whose true dimensions are difficult to grasp. Shinkle (2010) noted, “The extensive gameworlds, dazzling graphics, and sophisticated gameplay that players experience are a reduction and a representation of the technology’s inner
workings. Even the game form itself is rarely available to the player in its entirety” (para. 15).

Missing from the participants’ accounts of their piano activity was a corresponding sense of wonder about the creative process that produces music. They spoke of music as an artefact, as something that exists on the page. They did not talk about the infinite possibilities that exist in piano composition or express curiosity about why the composers whose music they were playing had made particular choices. In contrast, they expressed awe about the details and choices programmers had created for them in video games. Tristan did expand his range of possibilities for playing music by switching between his acoustic and digital pianos in order to access particular sounds. But he spoke of doing so only in order to recreate something he had heard someone else play, not as a way of producing unique music of his own. The participants appeared to position themselves as consumers of both piano compositions and video games. The video games, because of their technological vastness, afforded a greater opportunity to experience the sublime.

**Embodiment: the self and the sublime.** Hayles (1999) posited a posthuman existence where “there are no essential differences or absolute demarcations between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot technology and human goals” (p. 3). This merging of the physical body and the body as experienced in game play might explain why Michael talked about “literally” dodging bullets in a shooter game and why Tristan used his computer keyboard to “actually walk.” Gilbert-Rolfe (1999) wrote, “the sublime becomes identified with the idea and image of technology … at the point … where the technological is seen
to have become the origin of … a kind of thought and a kind of body which wasn’t there before” (p. 127, as quoted in Shinkle, 2010). This new kind of thinking and moving relates to Michael’s observation that he kills a lot more people in video games than he does in real life. In video gaming, the technology makes the rules. The technology is capable of providing an intensity of experience that makes the player feel as though there is a lot at stake in his actions. As I was trying to understand the way Tristan talked to the characters in Life is Strange, I naïvely asked if he actually spoke into a microphone or if he typed his responses. He replied, “There are normally five to six different options that you pick from.” This is a fascinating paradox: at the same time that the player feels a sense of limitless possibilities for the way the game might turn out, game play is severely constrained by the narrow choices afforded by the programming. Despite the constraints of the technology-given options, Tristan felt intense emotions as he watched the outcome of his “choices” unfold on the screen. This is indeed a new kind of thought. Similarly, the willingness of the participants to accept very limited physical movement, including restricting access to bodily functions like eating and urinating, suggests a new kind of body is involved in video game play.

In contrast, the participants were very aware of their bodies’ needs as they practiced the piano. When he described his physical surroundings for piano practice, James mentioned that his brother’s trombone is “usually kind of close to the piano so sometimes when I have to go up high it’s kind of hard because my elbow hits it.” This hyper-awareness of the body and its surroundings is opposite to the bodily experience Michael described as he sat practically horizontal on a couch, not moving for hours, as he played a video game.
The Role of Technology in Piano Practice

Constant contact with digital technology is a given during video game play. My participants ranged from using hand-held game devices, to holding specialized game controllers for console games, to using a computer keyboard and mouse for gaming. Since they were so comfortable holding and using technology for gaming, I wanted to know if they also used digital technology during their piano practice.

All the participants were aware of and had access to digital technology that could be part of their piano practice, but only one of them used it regularly. In my experience as a music student and teacher I have found that a metronome is the most basic and indispensable tool every musician needs to have on hand. Sam, James, and Colin all said they did not usually use technology for piano. I asked if they used a metronome. Sam replied, “my music isn’t complicated enough for me to use a metronome yet.” James said, “Rarely. I should but I really don’t like to, just because it frustrates me and doesn’t really help a whole lot.” Colin became pensive: “It would be a very good idea actually. It might help me keep pace.” Only Tristan indicated that he uses a metronome regularly, mentioning that he has one on his phone but does not need to use it because he also has a battery-powered metronome.

There are plenty of apps and online tools that the participants could be choosing to use to increase their musical knowledge or to enhance their practice experience. There are even general apps that help people set goals and plan their work flow. The participants did not mention any of these. It seems that their interest in video gaming does not extend to a general interest in having digital experiences outside of their gaming time.
For Sam and James, video game play is limited to weekends, and so digital engagement is cordoned off, time-wise, from the other activities in their life.

Tristan is unique among the participants in the way he integrates his digital life into his piano life. He recognizes the power of YouTube to provide models and instruction so that he is less reliant on his piano teacher to choose, demonstrate, and teach him new music. He uses YouTube tutorials to learn extra music on his own, supplementary to his regular lesson music that he selected in consultation with his teacher. He watches them on the computer in his room or on his phone if he is at the acoustic piano. He also records himself playing music that he has finished and wants to “show” to someone. Tristan talked about learning new songs by ear and then playing along with a YouTube performance of the music, which served to fill in the parts that he was missing in his own interpretation. This is an innovative strategy that does not depend on a pre-programmed game environment to give direction and evaluate his performance. Tristan mentioned that he once tried downloading and playing an app called Simply Piano but found that it was “super easy piano [that was] really boring.” He thought it was cool that the app could “listen to what you’re doing on the piano, … picking up the notes that I’m playing and seeing if they’re right or not and if I’m doing it right.” But he concluded that it was not for him. He thought it might be “nice for younger people to get into it.”

The limits of digital technology for piano learning. In trying to integrate his digital life into his piano life, Tristan ran up against the limits of the technology for piano learning. There are several possible reasons why he found the piano game app
unsatisfactory. One is the cocktail party problem, which computer scientists are still working to solve. This is the inability of a computer’s “ears” to distinguish between various sounds heard all at once, just as it can be difficult to pick out a single voice in the intermingled conversation at a party. The practical result of this unsolved problem is that a digital piano game is only able to “hear” and provide feedback on one note at a time. This is fine for trumpet players and singers, who can only produce one tone at a time. But for pianists, who might play up to ten notes simultaneously, using all ten fingers, the technology is useless in giving real-time feedback on their performance. This shows that digital technology is not as limitless as we might be led to believe. As Tristan experienced when he felt empowered to make autonomous choices in selecting his conversational snippets from a given list, digital technology masks its limitations to give us a sense of infinite power. Because we cannot fully take in what is there, we do not notice the parts that are absent. This connects back to the notion of the sublime. When something is so big as to be unknowable, humans temporarily lose a sense of the self, instead feeling somehow at one with the object of their awe. As players experience the limitlessness of a video game, they fail to notice the places where the technology ends and expanded possibilities begin.

**Conclusion**

The way that the participants perceived video games to contain limitless possibilities helped create a flow-like experience of the sublime for them as the boundaries between the physical self and technology blurred. In contrast, their piano practice world was more clearly defined, constrained as it was by the printed music on
the page and by the physical nearness of the social relationships that required their practice to have a finite end.
Chapter 7: Discussion

In this chapter I return to my research question along with the many wonderings that came from my review of the literature. After designing the research, collecting the data using phenomenological interviews, and analyzing the data using my own phenomenological writing and other phenomenological and scholarly sources, I can offer insights into many of the findings of other researchers on flow in piano practice and video gaming.

I begin with the wonderings that I articulated at the beginning of Chapter 3 as foundations for my methodology choices. These are the “Why… matters?” questions. After summarizing my findings as they relate to the questions that arose from the literature I reviewed in Chapter 2, I relate the main themes in my analysis (Chapters 4, 5, and 6) back to the original research question.

Flow in General

Flow is a powerful motivator for a person to go back to an activity again and again without being asked. I assumed young people played video games because they want to (they are intrinsically motivated) and I wanted to see which aspects of piano practice created similar feelings of wanting to engage.

While only one participant explicitly named video game play as a source of flow, the participants were all intrinsically motivated to play video games and all experienced moments of flow-like experience in their play. They all played independently of, and sometimes in spite of, parental expectations and wishes. One participant also experienced...
social motivation in the form of playing online with friends in distant cities and of imitating his older brother. Two participants used video gaming mainly as an escape from other realities. One participant named video gaming as a personal addiction, which suggests motivation that goes beyond intrinsic to compulsive. In the interviews the participants articulated many of the elements of flow Csikszentmihalyi (1990) identified, such as clear goals and feedback based on the rules of the game, intense concentration, a lack of self-consciousness, a transformation of time, and a sense of control. Physically they were more in control during video game play, but emotionally they said they had less control. Events in video games could make them angry or sad; they sometimes needed time to recover before continuing. This resonates with Engeser and Schiepe-Tiska’s (2012) assertion that flow and the experience of happiness are not the same.

Only one participant named piano practice as a source of flow experience, while one other participant said it came close. The remaining three participants said they had not experienced anything like flow at the piano. For the participant who named flow at the piano, his flow experience came, as the research predicts, at a time when his skill and level of challenge were balanced and high. His motivation to practice the piano had two aspects: intrinsic motivation in the form of wanting to perform the music better and wishing to take a break from homework; and extrinsic motivation in the form of pleasing his piano teacher and succeeding on his piano exam.

Two participants experienced a type of engagement in piano that came from a combination of audiation and physical performance. They chose to practice music where the music they heard internally filled in the gaps in their actual playing, so that they could enjoy an experience of listening to the music. Their motivation for this was intrinsic. All
the participants expressed that they had worked with their teachers to choose the music they were learning. In this way, autonomy was a common feature of their motivation to play video games and to practice the piano. However, added to the intrinsic motivation to play piano music of their own choosing were social expectations to please teachers and parents. One participant added his friends to the social aspect of his piano practice, as he sometimes practiced during Skype calls with friends. He also recorded his finished pieces for friends to listen to.

Despite the social functions of their piano practice, it is generally true of the participants that both their video game play and their piano practice were autotelic experiences — they would have done them even if they did not have to.

**Flow in Individual Music Making**

Piano practice is usually a solitary activity. It is useful to know that flow can and does frequently occur in individual activities, including music making. The participants played mostly solitary video games so their game play experiences could reasonably be compared with their solitary piano practice. I asked my participants about their family background in music making to see whether those with high musical cultural capital might experience flow in music making more as a result of habit than as a novel experience to be sought out.

Contrary to Valenzuela and Codina’s (2014) finding that music students from families where music making is a normal activity found more flow, in my participants there was no apparent relationship between family background in music making and ability to experience flow during piano practice. Of the two participants who said they
had experienced flow or something close to it, one had a strong parental background in music and one did not. The one participant with perhaps the strongest family ties to music explicitly said that piano practice had never been a source of flow experience.

The two brothers whose mother had a background of piano lessons both spoke about piano practice very much as an ingrained habit. One of these brothers said he experienced flow in piano practice and the other, while he did not claim to experience flow in any particular activity, appeared personality-wise to be what Csikszentmihalyi (1990), Ullen et al. (2010), and Dietrich and Stoll (2010) would call flow-prone. Piano was his happy place. The other thing these brothers had in common was that in their home video gaming was forbidden on school nights. This could indeed mean that piano practice was a source of flow-like experience for them during the week when it could not be crowded out by video game flow.

Smolej Fritz and Avsec (2007) found that music students experienced more flow in emotional than cognitive aspects. My participants seemed to find piano practice more cognitively engaging and video game play more emotionally engaging. However, they also experienced more challenge-skill balance in video game play.

**Adolescent Music Making**

Motivation and autonomy again come into focus here, as adolescents experience particular pressures to meet the expectations of parents, teachers, and peers. I expected to find that they might not be clear on whether any flow they experienced in music making was caused by intrinsic motivation (autotelic experience). However, comparing their
music-making to video gaming was sure to bring out contrasts in motivation, assuming that their parents and teachers were not commanding them to play video games.

The participants were motivated to play video games and to practice piano, but the reasons for their motivation differed. They all articulated intrinsic motivation in that their piano practice developed real world skills and extrinsic motivation in that the people in their social orbit expected or appreciated their music making. They were intrinsically motivated to play video games because they were transported by the experience but they did not express extrinsic motivation for video gaming. Some participants experienced extrinsic motivation not to play video games but their intrinsic motivation to play overcame social pressures.

Three of my participants reported having participated in music exams and festival performances, while all of them took part in their teachers’ studio recitals. The two participants who reported flow-like experiences were both looking for extrinsic rewards for their efforts; doing well in an exam and performing a piece in a recital. This finding is at odds with O’Neill’s (1999) hypothesis that working for an extrinsic reward, such as in a competitive environment, might inhibit flow experiences in moderate achievers. I did not interrogate or compare the level of achievement of my participants in piano performance.

**Presence in Video Gaming**

I was curious to know whether for my participants actually being present as the musical self, seated at the piano, felt anything like being present in the virtual world of a video game. It did not. They were clear in articulating that they had to concentrate on
controlling many more parts of their bodies at the piano than in video gaming. Piano practice found them in the “real world,” while video games transported them to another world where different rules, physical actions, and behaviour applied. As Jin (2011) found, the participants experienced spatial presence in virtual environments and self-presence where they felt at one with their avatar in video game environments. But they did not talk about virtual objects feeling real, which Jin called physical presence.

**Social Factors in Video Gaming**

My participants did not appear to experience social pressure to continue playing video games, which contradicts the findings of Zhou (2013) and Hsu and Lu (2004). They did, however, feel a social pull to persevere in their piano practice whether or not it was a flow experience. With respect to the findings of Chang (2013), Hsu and Lu (2004), and Jin (2011) that video game players who experience flow are more likely to keep playing, this was certainly true of video games for my participants. It was not so much the case in their piano practice. However, their ability to hear the music they wanted to learn, either via digital technology or in their own head, was a source of motivation to return to their piano music. Perhaps one could think of listening to music in one’s head as a form of micro-flow, which, while it does not require the body’s full attention or serve as a peak experience, offers some moments of transport out of the brain’s usual thought patterns.
Measuring Flow in Video Gaming

My findings support Nah et al. (2014), who wondered whether measuring flow in video gaming should be done differently than it is in sport. My participants revealed gaming to be much more of a cognitive than a physical experience. Despite the relatively small involvement of the body, their flow-like experiences seemed to be greater in gaming than in piano, which uses the whole body. This finding appears to contradict the flow research in sport, where the body’s movements play a large role in inducing flow.

Interactivity

My participants reported the most interactivity during solitary video game play, as they interacted with the game itself. This fits with the findings of Kim et al. (2005) that built-in interactivity in a game can help players balance challenge and skill to achieve flow. The participants who sometimes played against their friends online reported more anxiety in gaming as they felt less capable than their friends and did not want to let them down. This suggests that a challenge-skill imbalance resulted from being teamed with or matched against human opponents rather than carefully-crafted digital players. The interactivity they experienced in piano practice was disconnected in time and space as they practiced after choosing music in cooperation with teachers and before presenting the results of their practice back to the teacher.

Addiction

While I did not officially measure the perceived personal autonomy of my participants, they all professed a great deal of autonomy in both their piano practice and video gaming. Despite this, one participant claimed to be addicted to video games while
another expressed concern about his compulsion to play. These impressions would not support the thesis Sepehr and Head (2012) wished to test, which was that players who feel more personal autonomy are less likely to experience addiction.

**Effortless Attention**

The participants reported finding it easier to concentrate on video game play than on piano practice because they experienced the physical controls of video game play as more ready-to-hand. The necessity of controlling many parts of their body simultaneously caused them to focus their attention on their bodies as well as on the music itself. In video game play they could forget their bodies and focus on the game. This fits with Wulf and Lewthwaite’s (2010) constrained action hypothesis, where internal focus disrupts automatic motor processes and inhibits flow. My findings do not fit well with Bruya’s (2010b) Apertures, Draw, and Syntax model, which predicted that solving problems with perceived real world meaning would produce more flow. The participants positioned piano learning as having real world utility but did not experience a corresponding increase in flow experiences at the piano.

**Immersion**

In presenting my results I chose to distinguish between flow, which few participants explicitly said they had experienced, and *flow-like experience*, which is how I characterized situations where they said they felt partial flow. It could be argued that these flow-like experiences are akin to immersion, which Jennet et al. (2008) called an ingredient of flow. My participants’ flow-like experience in video gaming definitely sounds like immersion as defined by Kilili et al. (2012), where a player is having an
experience without there necessarily being a driving purpose behind it. Similarly, in Tristan’s flow-like experience where he repeated a piano piece over and over as if another person was playing it, he likely experienced a form of immersion, as he was not actively working toward the goal of improving his performance. Rather, he was repeating it in order to enjoy the experience.

**Autotelic Experience**

Csikszentmihalyi’s (1990) ideas about the autotelic personality helped point me toward personality traits to watch for in my participants. Intelligence should not matter for flow, but neuroticism might. Of the two participants who said they had never experienced flow, one was the person who seemed to me to be the most self-critical, which is the type of perfectionism that Dietrich and Stoll (2010) thought would be less likely to lead to flow. The other participant who did not claim to have felt flow was just the opposite; he seemed to be content no matter what he was doing and did not have much to say about why this might be so. He may be a person with an autotelic personality; if almost everything for him is flow, then he would not necessarily be able to pick out a particular experience and call it flow.

The participant who said he had experienced flow during piano practice exhibited what Dietrich and Stoll (2010) called positive-striving perfectionism. He had clear goals and was disappointed when he did not meet them and yet he was confident that he had the skills and knowledge to improve.

In my review of the literature on the autotelic personality and autonomy, I wondered whether certain people might experience a greater yearning for autonomy,
whether or not their environment afforded them autonomy, and whether this might manifest as flow proneness. None of my participants appeared to me to be particularly in need of asserting special autonomy because their environments already supported quite a lot of autonomy. The one partial exception to this is the brothers’ home, where video game play was not permitted on school nights. However, these brothers had a great deal of autonomy around video game play on weekends and during the summer. It was one of these brothers who reported experiencing flow in piano practice. This is the same person who was positive-striving. It is impossible to say whether his flow was more a consequence of his personality (nature) or of his environment (nurture).

**Embodied Cognition**

I was interested to hear from my research participants whether the way they used their bodies was important to their experience of flow. My participants reported experiencing video game technology as much more ready-to-hand than the piano. They needed to exert much more concentrated control of more parts of their bodies in piano practice, which made the piano much more present-at-hand. They reported more physical distractions during piano practice, such as an uncomfortable pedal or a trombone too close to an elbow. In contrast, in video gaming they mostly ignored their bodies’ discomfort, whether by postponing eating, drinking, and urinating, or by tolerating a slumped or scrunched posture.

The symbolic nature of video gaming seems to have induced more flow-like experiences for the participants, as they yearned to be transported to another world. In contrast, they connected musical symbols with the concrete physical movements the
symbols demanded, which, to the extent that the participants had difficulty creating these movements, did not promote flow.

Paradoxically, the flow-like experiences described by my participants in their video game play fit beautifully with Armstrong’s (2006) criteria for an activity to be considered embodied. They were situated in a highly visually-engaging virtual environment; there were time constraints; the games demanded their cognitive, active, and perceptive resources; their attention was fully engaged; and their game play emerged from their own actions. The reason I say this is a paradox is that the physical movements required to elicit these experiences were very small and contained in comparison with the larger resistance-based movements required to play the piano. The participants could be said to be thinking through their bodies, as Stubley (1998) characterized music performance, in highly efficient ways. Just as the machinery of a piano relieves the player from having to stand next to an array of strings and swing an arm to strike each string with a hand-held hammer, the affordances of digital technology can produce large and exciting results using very small movements. Video games are an extremely efficient way of using the smallest movements of the body to create the largest feelings.

Comparing Flow in Piano Practice and Video Gaming

I now return to my original research question: How do young piano students experience flow in their individual music practice and how does it compare to their experience of flow in video gaming?

In this research I found that the participants had fewer flow-like experiences practicing the piano than they did in playing video games. When they did experience
something like flow in piano practice, it compared with their video game flow in the following ways:

Flow in video gaming is governed by technology; it is the computer that decides which goals a player will pursue, whether the goals have been met, and when the player is permitted to rest and reflect on the experience. Death is the chief mechanism by which the technology controls the flow of game play, by offering unequivocal punishment for mistakes that produces an experience of momentary frustration and boredom. By eliciting strong emotions through death experiences, video games create motivation to continue playing to develop skill and achieve visible results. In piano practice, the control over flow experience is more internal. The static, unmoving music on the page does not make any demands; the musician’s goals come from social relationships and personal expectations. Unlike in video gaming, where mistakes bring death and make the player wait, participants viewed mistakes in piano practice as unproblematic. The motivation to correct errors was less immediate and the evidence of success much more elusive, as it was solely auditory and might require waiting until the next piano lesson for feedback from the teacher.

It was in video game play that participants were more likely to achieve a balance between challenge and skill. This is again a function of the way games are programmed to include many choices for players and also of the wide range of game types from which players may choose. The physical skills required to meet video game challenges were less problematic for participants than were the physical skills to meet challenges at the piano. They experienced video game technology as ready-to-hand, while the piano was often experienced as present-at-hand. Despite this imbalance, participants viewed playing the
piano as a useful real world skill and tolerated a lack of flow in piano practice because it had a goal beyond itself. In this way piano practice was not an autotelic experience for most of the participants; it was work. In contrast, the participants experienced no social or personal pressure to play video games; to the extent that they strove to meet self-prescribed goals in video game play, they did not perceive these goals to have any benefit or significance to their lives outside of the video game world.

Flow in video gaming relies on an intense visual experience that transports the player to a virtual world with its own set of rules and actions. The affordances of the digital technology are such that the player can only perceive a small fraction of the game world at a time. This produces a feeling of limitlessness and a sense of the technological sublime as the self becomes obscured in the face of the many possibilities offered by the game. In contrast, piano practice did not produce a corresponding sense of wonder in the participants. They were constrained by the finiteness of the music on the page and were not carried along in their practice by uncertainty about what might come next. They could see and hear it all at once. Relying on the piano as the main and usually only piece of technology they employed in their music learning, participants mainly did not incorporate digital technology into their piano practice, choosing to reserve this for their video game play. They did not choose to, or had not been taught how to, adopt and adapt the limitless possibilities of digital technology for their piano practice.
Chapter 8: Implications

While it turned out that my participants’ flow experiences in piano practice and video gaming were not as similar as I had anticipated, comparing the experiences yields a variety of ideas for piano pedagogy and the instructional design of digital tools to assist in piano pedagogy.

The original impetus behind my research for this thesis was to find ways to make piano practice more like video gaming. I wanted to inform my future work in using mobile technology to motivate learners in acquiring acoustic piano skills. The idea of using game elements came in part from the work of Birch (2013), who used rudimentary game mechanics to influence her piano students’ behaviour. In framing the research I assumed that the design of video games would promote more flow for my participants than they would typically find in piano practice. While this assumption was largely correct, some of my findings might take the form of a caution against trying to make piano practice more like a video game.

My ideas and recommendations below are a combination of suggestions for tweaking digital tools that already exist to increase their potential for inducing flow and a wish list of ways I hope digital technology might one day be able to imitate and support the best piano pedagogy practices.

Cautions about Gamifying Piano Practice

The participants viewed piano as a real world, work-like activity that helped them achieve important personal and social goals. To explicitly gamify their practice would likely negate the seriousness of the endeavour and cause them to reject game-like
elements. Indeed, I have tried gently to introduce digital music game technology with several of my current piano students. While they initially enjoy the games, their interest quickly wanes. This might be because they have difficulty finding games that are appropriately leveled to balance challenges against the students’ skills. However, if students lose interest even after some effort to find appropriate challenges, it may be because they prefer to impress me with the real work they have done on the piano when they come for their in-person lessons. The relationship between teacher and student seems to have far more motivating power for them than do the bells and whistles of the digital piano games. This experience echoes the findings from my research that most participants did not import digital technology into their piano practice sessions; they viewed piano practice as a real-world activity separate from digital gaming.

The limits of music gaming technology. In this research, none of the participants reported playing music learning games as a source of flow experience; the style of game in which they found flow was very different. It could be that adding death with the attendant forced rest breaks to music games would make them both more exciting and better for learning motor skills. Unlike the adventure and shooter games played by the participants, the input options for digital music games are clunky. The game controllers used by my participants had many more functions than most music gaming apps, which usually involve tapping a screen. The input situation for piano students using acoustic instruments is further complicated by the unsolved problem of Complex Auditory Scene Analysis (CASA), more commonly known as the Cocktail Party Problem. Computer programmers have not yet found a usable way to distinguish between two notes played simultaneously on a piano. Thus music game apps that use a device’s microphone to
“listen” to the pianist can decode only one note at a time. This limits the complexity these games can support; although the player has ten fingers available to play many combinations of 88 notes, the computer can only admit one sound at a time. Students whose skills are beyond those of a beginner need to be challenged by apps that can hear and provide feedback on every note they play.

**Technology and Student-Teacher Relationships**

Building on the finding that the real-world relationships of a piano student are a strong motivator for practice whether or not that practice involves flow, I can imagine ways to use digital technology to help diminish the distance in time and space between the student and the teacher outside of the lesson. At least two digital tools already exist to address this issue. Both of these tools focus on helping students practice smarter by guiding them to set goals, plan their practice sessions, and interact with their teachers between in-person lessons. Some findings from my research might help make these kinds of tools more effective.

**Practice planning.** iScore is an online tool developed by researchers at Queen’s University in partnership with The Royal Conservatory of Music in Toronto. Its purpose is to help music students set goals, plan their practice sessions, and share their work. One strength of this tool, as illuminated by my research, is that it treats piano practice as work with real world goals rather than trivializing it by making it overtly game-like. However, the use of the tool requires a great deal of work over and above the work of practicing the music itself. The design of iScore presents a large amount of material on the screen at one time; the number of choices and open-ended inputs required of the student can seem
overwhelming. My finding about students’ need to experience limitlessness suggests that student engagement with the tool might increase if the visual aspect were redesigned to feed the material to the student sequentially, one screen at a time. This would create space for students to make decisions in manageable chunks, balancing the challenge of deciding with their skill to self-assess. This resonates with Chen’s (2007) finding that furnishing a vast array of choices to balance skills and challenges is not conducive to flow. Chunking the material visually would create the impression of limitlessness; students might feel compelled to continue through the sections and add their inputs as a way to find out what will come next. Visual and/or auditory rewards for completing various sections could further motivate students to use the tool effectively. Rather than trying to turn piano practice into an actual game, the strategic incorporation of specific elements of video games might be effective in increasing flow. The very best reward for a student using any online practice tool is a personal acknowledgement from the music teacher when the student has completed a work plan or a practice session. The technology should serve to enhance, not replace, the relationship between the student and the teacher.

**Ideas for researching piano practice.** It would be fun to test user responses to different designs for a practice planning tool to find out whether adopting the concepts of chunking or leveling from video games would increase student engagement with the tool. In this vein, the revelations of the phenomenological interview methodology I used in this research make me think that research into the lived experience of music students who are actually using practice tools could uncover whether students are using them in the way the designers intended and the way their teachers expect.
**Recording practice.** Practicia is a mobile app for music students that audio records their practice sessions. It strengthens the teacher’s connection to the home practice environment by allowing teachers to issue assignments in the app using text, video, audio, and links. Students choose an assignment to practice, hit the record button, and the app “listens” to them practice. This capability reflects one flow-inducing element of video gaming I found in my research, which is that a video game is always observing and evaluating the player’s behaviour. The idea of making every practice session into a work product to be examined and evaluated is contrary to the way music students and teachers normally conceive of practice, which is a private time of working through problems and repeating sections of music many times to engrain them in the body’s neural pathways. However, it is exactly this feeling of being “on” and being observed that makes video game play so immersive. The players strive to be efficient and effective in their movements in order to achieve their goals. The danger of making efficiency and effectiveness into goals for piano study is that the creative and expressive elements of music making may get left behind. To counter this, I make the pedagogical suggestion that teachers using practice recording apps could try creating assignments that instruct the student simply to fool around, improvise, or otherwise relax and have fun creating exciting sounds on the instrument.

One potential limitation of a practice-recording app for inducing flow is that students must know, or quickly figure out, that the teacher cannot possibly listen to every minute of their recorded practice sessions. Thus the student is not really “on” in the same way that a video game monitors and reacts to every move. Students may come to feel that they are being tricked into thinking they are being monitored when they really are not,
which might have the unintended consequence of making them feel like their music
practice is futile. The goal of teaching students how to practice music effectively should
be to instill intrinsic motivation to improve their playing, so that the music itself and the
personal satisfaction of playing it become the rewards. They need to learn to listen
carefully to their own playing rather than always relying on someone else’s feedback. A
practice-recording app brings with it the danger of squelching or delaying this kind of
careful listening by making the practice always for the benefit of someone else.
Nevertheless, if a practice-recording app has the effect of inducing a flow-like experience
for the student who feels as though someone is listening, the flow-like experience may in
turn develop into intrinsic motivation.

**Measuring Success to Create Flow**

One of the chief differences between the two digital practice tools I mention
above is that one allows students to establish their own goals while the other presents a
limited set of criteria for achievement that teachers can assign to their students. In iScore
the Goals section is wide open; students can type in any goal at all, from winning a music
competition to playing three measures of a piece of music without stopping. This tool
makes good use of the affordances of digital technology to offer unlimited possibilities.
However, it relies entirely on human agents — the student and the teacher — to evaluate
whether the student has achieved the chosen goals. My research suggests that if there
were a way yet to be imagined for this tool to evaluate and reward students for making
effective choices in real time, this might enhance their experience of flow as they use it
during practice.
Time-based goals. Practicia’s mobile app design limits teachers to giving awards based on three criteria: amount of time practiced; consistency of practice (i.e., the number of days in a row of practice); and quality of practice (as evaluated by the teacher at the lesson). The argument for having time-based awards is that they increase the minimum amount of practice time. However, if the goal is to increase flow experiences for students, a better model would be to allow students to unlock the next assignment by practicing a certain amount of time on the current assignment. Rather than hopping around and playing a couple of minutes of one assignment and a couple minutes of another, students would be encouraged to persevere in one area for a predetermined amount of time before moving on to the next challenge. This would have the effect of increasing their skill to meet ever-greater challenges. My research showed that the participants looked forward to moving on to the next section of music just as they enjoyed beating a level in a game. If the technology does not permit them to move on to the next practice goal unless they persevere, they might experience a little of the sense of mortal danger that induced flow-like experiences in video gaming.

Practice recording technology is currently capable of “listening” but not of providing real-time feedback, which means that implementing immediate consequences for certain musical behaviour (e.g., wrong notes, playing too fast, inaccurate rhythms) is not yet possible. Digital technology cannot impose enforced rest breaks, or “death” during a practice session. As a substitute, requiring students to stay on a particular task before switching to something else might cause them to build in their own deaths, where they reach a point of having to struggle over their problems before trying again. If there is incentive, in the form of putting in the required amount of time on a task, not to simply
walk away from their problems they might learn to persevere just as a video gamer will go back again and again to try to conquer the enemy that blocks the path to the next part of the story. Having built-in death-like experiences might increase students’ experiences of flow as they pause to reflect on their choices while the technology invites them to keep trying to achieve their goals. The findings about my participants’ view of piano practice as work show that they might be accepting of technological intervention that illuminates and validates their struggle. After all, music students’ goals are not to say they have spent a certain number of minutes in practice. Their goals include being able to reproduce music they love, preparing to perform for others, and demonstrating progress to their teachers.

**Goal choices.** The participants in this research articulated a variety of goals for their piano learning, including pleasing their teachers and parents, performing for others, taking piano exams, and “beating” a piece by being able to play it through. They viewed piano practice more as work than as play because it both required effort and had nontrivial goals. I am a little troubled by this view that piano practice needs to be goal-oriented. While it is certainly a reasonable corrective to video game play to the extent that participants viewed video gaming as not developing useful real world skills, I wonder if there is a more nuanced explanation. To spend time playing video games is to immerse oneself in created worlds where there is almost always a distant goal attained by meeting multiple subgoals. Sandbox games like Minecraft do not have explicit goals, but the corollary of the lack of goals is that they do not produce as much flow (Tristan articulated this in his interview). So to the extent that players are immersed in goal-oriented
environments as they strive to achieve flow-like experiences, I wonder if they are becoming enculturated to seek experiences more generally that have goals. Before video game technology, a young person’s play might have included activities with simple rules and immediate goals, like playing tag, putting on a play, or doing a crossword puzzle. Other play would be devoid of goals, like swinging in the park or creating paper dolls. In this way, a possible consequence of playing video games for the modern teen is to become acculturated to an activity where many incremental tasks over time accumulate to attain a larger goal. Indeed, it is this capacity to break down a task and persevere to completion that university recruiters covet in music students. Perhaps video game play gives music students an advantage in persevering through technical practice tasks that, while they do not produce flow, advance the student toward a larger goal. If the students know, from their video game play, the satisfaction of achieving a far-away goal they may be able to transfer this feeling to their piano practice. Indeed, one of my participants talked about learning a page of music as being like beating a chapter in a video game.

**Expanded goals.** While being goal-oriented certainly helps piano students achieve the proficiency and social recognition they desire, perhaps it is worth asking to what extent video game play encultures students to strive for particular kinds of goals at the expense of other goals. For example, none of the participants in this research recalled experiences of pure improvisation or fooling around on the piano. They also did not report flow-like experience while playing technique. Technique comprises scales, chords, and arpeggios that form the building blocks of piece of composed or improvised music.
Both improvisation and technique are extremely important elements of practice that create a capable, well-rounded musician. But it is harder to attach specific goals to these kinds of practice. A student can add goals to technique by striving to play accurately and evenly at ever-increasing tempos. But there is a limit to how exciting this can be for the average student, especially outside of the need to play the element in question in the context of a beloved piece of music the student is working on. Just as smaller tasks are completed quickly and efficiently in a video game in order to move on, a student might be inclined to practice the minimum amount of technique possible in order to achieve a larger goal.

Is there a way that digital technology might help piano students experience flow in practicing technique? If it could, this would certainly help correct the imbalance my participants experienced, where the piano was present-at-hand because of complex coordination issues while video game technology was ready-to-hand. To the extent that improving technique causes the piano to become more ready-to-hand, students might experience increased flow more generally during their piano practice.

Once the CASA problem has been solved, I can imagine creating a game that requires pianists to play technical elements in order to achieve goals in a game. As I found in this research, visual feedback has a large role in flow experiences of video gaming. For this reason, it would be good to marry simple but effective visual feedback with auditory analysis of acoustic input in order to provide real-time feedback to a pianist working on technique. JoyTunes’ Piano Maestro app makes a good first attempt at this combination of auditory analysis and visual feedback. It is limited in its ability to provide accurate feedback by the CASA problem; a student can easily game the game and rack up
points by playing with only one hand when the game asks for two hands because the app cannot really evaluate both hands at once. The choices made in programming the app do not include death-like experiences; the player is not allowed to crash and burn. Instead the app carries on with the pulse of the music even when the player falls behind. The settings can be adjusted so that it waits for the player to play the correct note before moving on. In this way, I imagine the creators are striving to marry challenge and skill in a way that does not discourage students from persisting. From the point of view of inducing flow, the negative effect of this is that there are no devastating in-game consequences for making mistakes. My participants described the death that came with mistakes as an exciting part of their flow-like experiences in video game play.

**Creating mortal danger in music practice.** There is evidence that forced pauses are an important ingredient of good in-person piano instruction, which means that it would certainly be a worthwhile ingredient to include in digital music practice tools once the technology is capable of this. In their study of common elements among three renowned artist-teachers of music, Duke and Simmons (2006) identified several techniques that are also found in flow-inducing video games. Some of these have to do with clear goals that balance the student’s skill against musical challenges. Others have to do with clear feedback that is appropriately timed; negative feedback is frequent and tied to specific errors, while positive feedback is random and effusive. The technique that connects with video game death is that the teachers stopped students immediately when they made an error. Errors were addressed before students were permitted to continue playing. When Parkes and Wexler (2012) replicated Duke and Simmons’ study to see
whether three studio teachers in a university used the same techniques, they found that these teachers generally allowed students to play through errors. They were selective about which errors to address following the performance. This is very different from video game feedback, which has zero tolerance for rule breaking. It would be interesting to study students’ experiences of flow during their music lessons to discover whether these kinds of differences in teacher behaviour have an effect on student motivation and learning. Is it possible that we do our students a disservice by not demanding enough of them during their lessons? Do our students imitate us in their individual practice by being more or less critical of their own playing?

Following the model of excellent teachers and knowing our students well allows teachers to balance challenges with skills and create flow experiences for our students during their lessons. If digital tools cannot replace our ears, eyes, and hand when students practice at home, we should strive to help our students to become their own teachers who notice and correct mistakes during practice at home. One way digital practice-recording tools might help is by forcing a student to listen to his or her own recording of a particular assignment before permitting the student to proceed to the next challenge. Listening to recordings of oneself is a difficult discipline for a musician to develop. Perhaps digital practice technology could have a role in turning this scary experience into a more habitual and routine part of practice.

**Directions for Future Research**

One of the chief benefits of using phenomenological interviews and writing in this study has been to realize the power of this methodology for uncovering unexpected
aspects of lived experience. It would be very interesting to apply this methodology to the study of music students as they interact with digital technology both in their music lessons and during home practice. Teachers who rely upon tools and apps like iScore, Practicia, and Piano Maestro to motivate their students would benefit from discovering whether students are using them in the ways the teachers intend. Do the apps increase flow experiences by keeping students engaged and focused on their music learning goals? Or do students learn to game the games by treating them like games and not as tools to enhance earnest physical efforts on their instruments? This can happen when a game is not designed to work well with the actual physical motions required to produce “real” music. For example, I recently evaluated a series of music learning games in the New York Philharmonic KidZone. While most of the games did not actually involve playing music, there was one game that required me to “play” an instrument by clicking a mouse. As a professional collaborative pianist, I expected to be able to read the music and click at the right moments to produce the required computer-generated sounds. However, I found it impossible to succeed at this task as long as I was thinking like a musician and moving my hand at the time I would move if I were playing a real instrument. To beat the game I had to switch my mindset entirely and think like a video gamer, relying more on visual cues than on auditory inputs to time my clicks in a way that the game interpreted as correct. This is one of the dangers of digital music game technology; it may have unintended consequences of training students to be gamers and not musicians.

Another idea for future research is to explore the phenomenology of flow in piano performance, as opposed to piano practice, as it relates to flow in video game play. Indeed, the element of constant surveillance contained in music apps like Practicia and
Piano Maestro appears to simulate performance more than what is traditionally defined as practice. It would be interesting to explore the effect on piano students of being observed during most of their interaction with their instrument, just as a video game player is always “observed” by the technology. What difference does this observation make, and does it matter whether the observer is a parent sitting nearby — either loving and patient or tired and demanding — or a piece of dispassionate digital technology with its attendant power to assign numbers to the practice session?

One of the unfortunate things about this research was that I was not able to address any of the questions around gender that arose in the review of the literature. The definition of what was considered a to be a legitimate video game was likely constrained by the gender of the participants. It would be helpful to do more phenomenological research on piano practice and video gaming with a wider range of genders. Expanding gender might bring with it a wider range of video game styles. If it did not, then specifically looking at different types of gaming, including more physical games like the Wii, virtual reality games like Oculus Rift, and puzzle or collecting games on mobile devices might yield different insights into the experiences of flow in gaming and piano practice.

As digital tools and games become increasingly integrated into our students’ lives, I encourage all piano pedagogues to think creatively and experiment with ways of helping our students achieve flow experiences in their piano practice. I look forward to living in a world where, regardless of the role of robots in fulfilling our daily needs, humans continue to engage in musical performance as a demonstration of the pinnacle of what our nervous systems can achieve and what space aliens most covet.
References


Appendix 1: Research Invitation

INVITATION TO PARTICIPATE IN UNIVERSITY RESEARCH

Are you
☐ 11-17 years old?
☐ a piano student who takes weekly lessons?
☐ a video gamer who plays at least 7 hours a week?

Carolyn Wagner is researching the phenomenology of flow in music learners and video gamers. The purpose is to understand the actual experience of people who practice piano and play video games so we can use digital gaming technology to make piano practice more interesting.

This research is part of Carolyn’s Master of Education work at the University of New Brunswick.

You will complete 3 quests:

Make an audio recording of yourself playing piano alone at home for about 10 minutes. I want to hear a part of your practice when you are completely absorbed in the music, where you feel both challenged and very capable. I will not be judging the quality of your playing. I just want to hear what it sounds like when you play something that really holds your interest right now.

Attend a personal interview about 1 hour long at a time that is convenient for you. The interview will be conversational and relatively unstructured. A sample interview question is, “Thinking about playing your favourite video game, what do you remember about a time when you were really being challenged but you also felt capable to succeed?” I may invite you to come back later for a second interview with other students to talk together about your experiences with piano practice and with video games.

Fill out an information sheet that asks basic questions about your habits when you practice piano and play video games. You can ask your parents to help you if you want. It should take about 10 minutes to complete.

Stuff to know:
☐ Your participation is totally voluntary and you can withdraw at any time.
☐ Your responses will be completely confidential.
☐ This project has been approved by the Research Ethics Board of the University of New Brunswick and is on file as REB 2015-088.
☐ Your parent/guardian will have to sign a consent form (I’ll drop it off so they can meet me).
☐ The interview will be in my piano studio at 330 Church Street. Your parent/guardian may sit in my waiting area during the interview if they want.

For more information or to sign up to participate, contact Carolyn before October 10, 2015.

Email: c.wagner@unb.ca 
Phone: 474-1551 
Text: 506-260-5534
Appendix 2: Letters of Consent

Consent Form
The Phenomenology of Flow in Music Learners and Video Gamers

This form asks you to indicate your willingness to have your child participate in a research project conducted by Carolyn Wagner, master's student in the Faculty of Education at the University of New Brunswick. This project has been approved by the Research Ethics Board of the University of New Brunswick and is on file as REB 2015-088.

The purpose of the research is to understand the actual experience of people as they practice the piano and as they play video games. To gather data for this research I will interview several piano students. The interviews will be conversational and take about one hour. I will also ask each student to create a 10-minute audio recording of him or herself practicing piano alone at home and to fill out a general information sheet about her or his piano practice and video gaming habits.

Participation in this research is entirely voluntary. Students are free to withdraw at any time. They may decline to answer specific questions. If at any time during the interview they feel uncomfortable about continuing, they may stop the interview and ask me to destroy any notes and recordings.

Participation is completely confidential. The transcript of the interview and information sheet will use a pseudonym and I will destroy the original recording and information sheet. I will analyze the data from the interview and information sheet to help me create my master’s thesis and possibly other scholarly papers to present at conferences and publish in journals. I will keep the transcripts locked in a filing cabinet for no more than five years before destroying them.

I hereby agree that my child may participate in the research described above:

<table>
<thead>
<tr>
<th>Child’s Name (please print)</th>
<th>Parent/Guardian Name (please print)</th>
</tr>
</thead>
</table>

Date ______________________  Parent/Guardian Signature ______________________

If you would like copies of publications (e.g., thesis, journal article) that emerge from this research, please check the box below and provide your email address. I will store your contact information separately from your interview data and the two will not be linked.

☐ Please provide me with a copy of the manuscript at the following address:

Name: __________________________________________

Email: __________________________________________
Consent Form (Adult Participant)
The Phenomenology of Flow in Music Learners and Video Gamers

This form asks you to indicate your willingness to participate in a research project conducted by Carolyn Wagner, master’s student in the Faculty of Education at the University of New Brunswick. This project has been approved by the Research Ethics Board of the University of New Brunswick and is on file as REB 2015-088.

The purpose of the research is to understand the actual experience of people as they practice the piano and as they play video games. To gather data for this research I will interview several individuals. The interviews will be conversational and take about one hour. I will also ask you to fill out a general information sheet about your piano practice and video gaming habits.

Participation in this research is entirely voluntary. You are free to withdraw at any time. You may decline to answer specific questions. If at any time during the interview you feel uncomfortable about continuing, you may stop the interview and ask me to destroy any notes and recordings.

Participation is completely confidential. The transcript of the interview and information sheet will use a pseudonym and I will destroy the original recording and information sheet. I will analyze the data from the interview and information sheet to help me create my master’s thesis and possibly other scholarly papers to present at conferences and publish in journals. I will keep the transcripts locked in a filing cabinet for no more than five years before destroying them.

I hereby agree to participate in the research described above:

Name (please print)  Signature

Date

If you would like copies of publications (e.g., thesis, journal article) that emerge from this research, please check the box below and provide your email address. I will store your contact information separately from your interview data and the two will not be linked.

☐ Please provide me with a copy of the manuscript at the following address:

Name:  

Email:  

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Appendix 3: Participant Information Sheet

PARTICIPANT INFORMATION SHEET

Experiences of practicing the piano and playing video games

Please bring the completed sheet along to your interview.

**General information**

What is your name? (first and last)

What name do you like to be called by?

How old are you? What is your gender?

What language(s) do you speak at home?

How many years have you taken piano lessons?

How many years have you taken music lessons (other than piano)?

**Your home piano practice routine**

How many days per week do you practice?

Approximately how long is each practice session?

How do you decide when to practice? (e.g., it’s the same time every day, or my parent tells me to, or when I feel like it, etc.)

How many hours do you think you practice piano in an average week?

**Your family and music**

Did either of your parents take music lessons as children?  ☐ Yes  ☐ No

If yes, please describe briefly (instrument(s) and number of years of study):
Do you have brothers and/or sisters who take music lessons?

If yes, please list them here.

Age: ________ Instrument(s): ______________________ # years of study: ______
Age: ________ Instrument(s): ______________________ # years of study: ______
Age: ________ Instrument(s): ______________________ # years of study: ______

*Your video gaming experience*

About how many hours do you play video games on an average school day? ________________

About how many hours do you play video games on an average weekend day? ________________

What is (are) your favourite video game(s) that you have played in the past month? ________________

What is your favourite video game ever? ________________

What technology do you usually use for video gaming?

Please check one box for each technology.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Usually play</th>
<th>Sometimes play</th>
<th>Rarely play</th>
<th>Never play</th>
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<tbody>
<tr>
<td>Console (e.g., Xbox, Wii, Playstation, etc.)</td>
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<td>Computer (Mac or PC)</td>
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<tr>
<td>Other (please be specific):</td>
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</tbody>
</table>
Curriculum Vitae

Candidate’s full name: Carolyn Luise Wagner

Universities attended:

  University of Winnipeg, 1988-89

  University of Alberta, 1989-1992, Bachelor of Arts with Honours (in Economics)

Conference Presentations:

  Searching for the Nod: Phenomenological Inquiry, Graduate Research Conference,

  University of New Brunswick, April 2016