The Process of Entering Flow
and the Outcomes of Flow in Product Trials

by

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Abstract

Flow is a psychological state that is considered to be an 'optimal experience.' Given its power in eliciting positive experiences, flow has been suggested to be an important topic for future research. However, the literature lacks a nuanced understanding of flow and it has yet to expand beyond the online context in consumer behavior research. This dissertation addresses these related problems through two essays. The first essay addresses the underlying problem by helping understand the process of entering flow. I demonstrate how the two component parts of flow- fluency and absorption, combine to elicit flow. Across three studies I demonstrate that fluency-related aspects of an experience facilitate the absorption-related experiences, which mediate perceptions of being in flow overall. In Study 1 I demonstrate that the perceived fluency of listening to a song increases absorption which mediates perceptions of being in flow. In Study 2 I replicate the flow process model in the context of reading. Study 3 is dedicated to shutting down the relationship between fluency and absorption. I shut down the relationship between fluency and absorption by having people work on an easy Sudoku puzzle.

The second essay builds from the findings of the first to facilitate flow in product trials and demonstrate the positive consequences it has for product attitudes and the desire to engage with the products again. I use three studies to achieve these goals. In Study 1 I demonstrate that flow experienced in the trial of a rowing machine mediates the desire to engage with the rowing machine again. In Study 2, I demonstrate that manipulating curiosity before the trial of an augmented reality game facilitates flow while playing the game. In Study 2 I also demonstrate that flow mediates an increase in attitudes towards the game and the desire to play the game again. In Study 3 I demonstrate that the relationship between curiosity and flow is moderated by

the valence of information that elicits curiosity. Again, flow mediated the desire to listen to the song again in the future.

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Dedication

I dedicate this dissertation to my family, who has supported me through my program. My father Richard, mother Kathy, brothers Luke and Matt and sister Renee.

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CHAPTER 1

INTRODUCTION

Flow is a psychological state that is considered to be an 'optimal experience' as it gives rise to feelings of both personal growth and enjoyment (Csikszentmihalyi 1997) and has been suggested to be an important topic for future research (Fredrickson 2001). However, the literature lacks a nuanced understanding of flow beyond a phenomenological methodology and it has yet to expand beyond the online consumer behavior context. Consumer behavior researchers have called for a deeper understanding of the flow experience from different conceptual backgrounds to address these concerns (Novak, Hoffman and Yung 2000). My dissertation research addresses these related problems in the form of two essays. The first essay addresses the underlying problem by helping understand how to facilitate flow. The second essay uses those findings to facilitate flow in product trial contexts to broaden our understanding of the implications that flow has for marketers and consumers.

The first essay demonstrates how the two component parts of flow- fluency and absorption (Engeser and Rheinberg 2008) combine to elicit flow. For the sake of this research I define fluency as the subjective feeling of ease (Tsai and McGill 2011), and absorption as the degree of focused attention (Agarwal and Karahanna 2000). I explicate the process involved in creating flow across four studies. In the first study, I demonstrate that the perceived fluency of an experience increases absorption which mediates perceptions of being in flow. I use involvement, which is a well-documented antecedent to flow (Hoffman and Novak 1996), to initiate the process. Involvement increases the perceived fluency of an experience, which increases the level of absorption which mediates the likelihood of whether one perceives being in flow or not. In Study 2 I replicate the flow process model of fluency leading to absorption leading to flow.

However, instead of initiating the process with involvement I manipulate fluency and absorption directly. Study 3 is dedicated to shutting down this fluency to absorption relationship and strengthening it, respectively. In Study 3 I shut down the relationship between fluency and absorption by having people work on an easy puzzle. The same positive relationship between fluency and absorption exists when participants work on a difficult task, but the relationship is thwarted when the task is too easy as participants experience fluency but fail to become absorbed. These studies suggest that the amount of attention that a task requires will moderate the relationship between fluency and absorption such that an increased amount of attention will facilitate the relationship.

The second essay builds from the findings of the first to facilitate flow in product trials and demonstrate the positive consequences of flow for product attitudes and desire to engage with the products again. With the knowledge that absorption is the key to experiencing flow, I use curiosity as a means to become absorbed and facilitate flow. I then moderate the relationship using the valence of information that elicits curiosity. Negatively-valenced information limits the fluency of information acquisition which thwarts absorption and flow. In all cases, inducing flow facilitated increased product attitudes and a desire to engage with the product again.

I use three studies to show these effects. In Study 4 I demonstrate that flow experienced in a product trial mediates the desire to engage with that product again. I reveal that the presence of a salesperson is distracting, which restricts flow when customers are testing a fitness machine. The decrease in flow mediates a decrease in intentions to use the product again in the future. In Study 5, I demonstrate that manipulating curiosity before a product trial for an augmented reality game enhances flow while playing the game. Moreover, I demonstrate that flow mediates an increase in attitudes towards the game and the desire to play the game again. Lastly, in Study I

use the knowledge gained from objective 1 with regards to the flow process to demonstrate that the valence of information that elicits curiosity moderates the relationship between curiosity and flow. Negatively-valenced song reviews did not differ in the degree to which they increased curiosity relative to positively-valenced song reviews but only positively-valenced reviews enhance fluency and subsequently flow.

My primary contribution to the literature is enriching the understanding of how flow is created. This research establishes a theoretical understanding of how flow's primary components (i.e. absorption and fluency) contribute both independently and together to create the flow state. By conceptualizing flow as the combination of absorption and fluency—and manipulating it as such—my research is the first to demonstrate that flow has unique consequences beyond fluency and absorption alone. As the experimental manipulation of flow has been largely unexplored (see Moneta 2012 for an extended discussion), demonstrating how to manipulate flow is a noteworthy advancement to both the flow and consumer behavior literatures.

The second primary contribution of this research is both theoretical and practical by enriching our understanding of the potential implications that flow has for marketers and consumers. This research also contributes to the consumer behavior literature by demonstrating the importance of curiosity in product trial contexts (e.g. listening to a new song, trying a new fitness machine, engaging with a new technology) via its role in eliciting flow. In doing so, I advance knowledge of the relationship between curiosity and flow by empirically testing a positive relationship. Moreover, I transcend current theorizing by demonstrating that the relationship is moderated by the valence of information that elicits curiosity. These findings have most notably practical value for marketers in understanding how to facilitate the adoption of new innovations.

These findings also contribute to the persuasion and behavior change literatures. With a focus on the context of exploring/trialing products I demonstrate the efficacy of flow as a mediator of attitude and behavior change. The ability to create positive changes in the studies is of particular significance given the original negative attitudes towards the genre of music and the unfamiliar nature of learning a new technology, both of which are activities that consumers would be somewhat apprehensive about starting. Together, the studies also inform the literature on curiosity to demonstrate its importance in eliciting flow when creating advertisements and designing products.

I address the two research objectives separately in their respective essays. First, I will address the relevant literature to understand the process of entering flow and create a model to test empirically. In Chapter 3 I will discuss three studies supporting my flow process model. I will then move on to the second essay by discussing the relevant literature related to the outcomes of flow and the role that curiosity can play in eliciting flow. Based on the literature and the findings from essay 1, in Chapter 4 I develop a model of how to induce flow in the product trial context and discuss the consequences of flow. In Chapter 5 I test these propositions in product trial contexts across three studies. In Chapter 6 I discuss the contributions that both essays in this research have for various literatures, consumers and practitioners.

CHAPTER 2

FLOW PROCESS (ESSAY 1)

The following quote illustrates the phenomenology of the flow state, and it is one of three quotes used in the questionnaire (Csikszentmihalyi and Csikszentmihalyi 1998, p. 195) that attempts to measure flow by asking an individual if they experienced the following:

"My concentration is like breathing I never think of it. When I start, I really do shut out the world. I am really quite oblivious to my surroundings after I really get going. I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the world."

The quote describes flow as being a psychological state of deep but seemingly effortless involvement that gives rise to enjoyment (Asakawa 2004). Flow was suggested to represent a unique mental state of ordered consciousness and is epitomized by the feeling one gets when they are in a state of deep but seemingly effortless involvement and everything seems to be going right (Csikszentmihalyi 1975). Athletes refer to flow as 'being in the zone' and it transcends gender, race and task such that the same phenomenological descriptions accompany all flow experiences (Csikszentmihalyi 1990). Flow is described by those who experience it using at least one of the following characteristics: a merging of action and awareness, a loss of self-consciousness, a distorted perception of time and a sense of control (Csikszentmihalyi 2000). As a result of these factors, flow is an autotelic experience such that it is intrinsically rewarding and can be engaged in for its own sake (Webster, Trevino and Ryan 1993), giving rise to strong positive affect through feelings of gratification (Novak et al. 2000).

Modern flow research has developed the original findings by consolidating the feeling states and the corresponding items of the flow state scale into two primary components: fluency and absorption (Engeser and Rheinberg 2008). Several psychological states can help to conceptualize the absorption element of flow, including cognitive absorption, immersion and transportation. The terms all represent a high degree of mental devotion (attentional resources) to a specific stimulus. Cognitive absorption represents the cognitive state of actively engaging and fully attending to something, which is inherent in the state of flow and what essentially gives rise to some of its experiential aspects (Agarwal and Karahanna 2000). Immersion and transportation represent the psychological perceptions of disengagement from surroundings that result from full attention to a stimulus. As attention increases to the degree that one disengages from their "reality" and their primary focus of attention is into the context of their experience or evaluation object, they are said to be immersed (Lombard and Ditton 1997).

Immersion, which as evidenced above can be defined synonymously with absorption, represents the second and most critical component of flow (Schiefele and Raabe 2011). See Van Laer, Ruyter, Visconti, and Wetzels (2014) for a nuanced discussion of how flow is different from other related constructs such as narrative transportation and immersion. For the sake of this research, I support previous theorizing that immersion is a critical component of flow (i.e. absorption), but must be experienced with fluency to be flow, since full attention does not necessarily mean flow, as it is also experienced with anxiety (Schiefele 2013).

Table 1- Seminal Flow Research

Authors	*Year*	*Contribution*
Csikszentmihalyi	1975; 1990	Original Flow Conceptual Model.
Hoffman & Novak	1996	Conceptual model of Flow in the online context.
Rheinberg, Vollmeyer and Engeser	2003	Flow short scale development, including the fluency and absorption subscales.
Dietrich	2004	Conceptual model of flow from a neuroscience perspective (transient hypo-frontality model).
Engeser & Rheinberg	2008	Flow Manipulation. Development of the skill-challenge model of manipulating flow.
Schiefele	2013	Flow measurement. Supports the two-component model of absorption and fluency.

Following the modern conceptualization of flow, I differentiate flow from such constructs by highlighting a necessary degree of automaticity or fluency in addition to full attention. For the purposes of this research, I suggest that fluency is the perceived ease or automaticity of a task which can be achieved in many ways. Any variable related to enhancing the ease of a task can serve as a manipulation of fluency and thus flow. For example, fluency can be manipulated by adjusting the difficulty of the task, as increasing the degree of difficulty limits progression and positive reinforcement towards completing a task (Hiebert 2005). The effects of difficulty on perceived fluency have been demonstrated in such contexts as reading and can be attributed to the metacognitive experience of processing disfluency (Schwarz 2004; Song and Schwarz 2008). Subjective feelings of disfluency have also been demonstrated in various consumption contexts

by creating difficulty in the ability to imagine or represent a product/experience in one's mind. Petrova and Cialdini (2005) demonstrated that difficulty in producing a representation or image of a product in one's mind decreased product evaluations.

Conceptual and perceptual fluency have also been explored in the consumer domain (Shapiro 1999). Semantic primes of perceptual features of a product have been demonstrated to increase perceptual fluency and subsequently increase liking of that product when seen later (Labroo, Dhar and Schwarz 2008). Fluency has also been manipulated in consumption contexts via increasing font size or making the font color more distinct to increase consumer choice confidence (Tsai and Mcgill 2011). Words presented in a large font are processed in a manner that is subjectively more fluent than the processing of the same words in a smaller font (Reber and Schwarz 1999). For the sake of this research, each of the different types of fluency has the same effect in our discussion in that they increase the ease of the experience. I will simply use the term fluency in my models.

Beyond the conceptualization of flow as fluency and absorption, it is important to note that flow experiences fall on a continuum from *microflow*, which is experienced in shorter, less complex tasks, to *deepflow*, which is experienced in longer, more complex tasks requiring a high level of knowledge (Csikszentmihalyi 2000). The distinction between *microflow* and *deepflow* is not based on the strength of the absorption and fluency per se, but rather on differences in the duration and nature of the task. However, absorption and fluency may differ as a result, but this has yet to be shown. For example, *deepflow* could be experienced by an athlete competing in an important sporting event (Jackson 1992), while *microflow* could be experienced when listening to a song. The outcomes of these experiences may differ dramatically based on the differences in duration of the task. For example, the level of enjoyment that results from flow as extended in

time through a sporting event may differ from that experienced in a song. Moreover, the level of absorption that is reached may also differ as a result of time. Although research has not determined what exactly the differences in outcomes will be, I am careful to make the distinction that this research focuses specifically on experiences that fall closer to *microflow*. For the sake of this research, when I refer to flow, I am referring to *microflow* and am careful to note that these findings do not necessarily apply to *deepflow* experiences.

CONCEPTUAL DEVELOPMENT

Although the established flow scale (Rheinberg, Vollmeyer, and Engeser 2003) recognizes that flow has the components of absorption and perceived fluency, research has yet to delineate the relationship between flow and its sub-components. Research attempting to manipulate flow has instead focused on the match between skills and task demands (e.g. Keller and Bless 2008). Studies attempting to manipulate flow have operationalized this by calibrating players' skillsets in games such as Tetris and Pacman and then manipulating the difficulty of the game to provide a skill balance (Moller, Meier and Wall 2010; Rheinberg, et al., 2003). However, we suggest that this focuses solely on the fluency component of flow and overlooks not only the absorption element but also the important relationship between absorption and fluency.

Following the conceptualization of flow as the combination of fluency and absorption, this research demonstrates how the two are related to give rise to flow. The literature suggests that fluency and absorption are related such that each has been demonstrated to facilitate the other. Research suggests that absorption can enhance fluency. For example, research suggests that focused attention to a task can decrease the focus on the passage of time, which will lead it

to be perceived as flying by (James 1890; Hicks, Miller, Gaes and Bierman 1977). Alternatively, the perceived fluency of a task should also facilitate absorption into that task. Research suggests that perceived fluency results in liking (Reber, Schwarz, and Winkielman 2004; Reber Winkielman and Schwarz 1998) and a motivation to engage with that stimulus (Song and Schwarz 2008) which both suggest devoting more attention and the subsequent potential for absorption.

Although both fluency and absorption will be related to each other, given the reliance of absorption on fluency, I make the suggestion that fluency is more appropriate as the antecedent to absorption and subsequently flow in a process model. Absorption is the result of devoting an increasing amount of attention to the point of being fully immersed (Agarwal and Karahanna 2000). In order to maintain a continued progression of attention, the experience should be going well (i.e. fluent). If things are not going well or if there are distractions, one will necessarily disengage in some manner and lose absorption into the activity. However, if things keeps going well (i.e. fluently) they can sustain their attention until the point in which they reach a state of flow. The model including absorption as the mediator of flow is also consistent with research which suggests that absorption is the most critical and core element of flow (Schiefele and Raabe 2011; Schiefele 2013).

It seems appropriate that the level of absorption into the task is more reliant on the level of fluency of that task than fluency's reliance on absorption. Moreover, given the nature of time that must pass to become absorbed, it seems appropriate that fluency is required to maintain attention on the task and allow one to become fully absorbed to the point of experiencing flow. When the two primary components of flow have been experienced in this way one will perceive a fluent state of total immersion- flow. Given absorption is the second, but necessary component

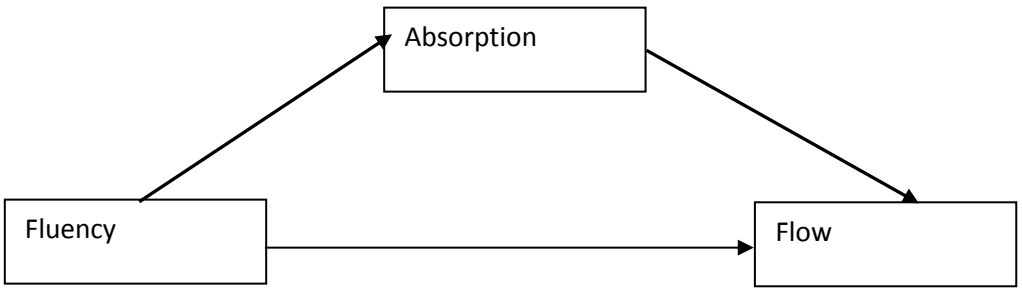
to experiencing flow (Scheifele 2013), absorption should be the mediating mechanism of determining whether one experiences flow or not. To summarize the relationship between fluency and absorption and their relationship to the overall flow experience, I suggest that:

Hypothesis 1: the fluency-related experiences of flow will give rise to the absorption-related experiences

Hypothesis 2: absorption will mediate the relationship between fluency and experiencing flow

In the data analysis I will test two models in order to determine which of them has the best fit as the flow process model. First will be my proposed model, where fluency leads to absorption which mediates whether people experience flow or not. Second, I will test the alternate model, where absorption leads to fluency and flow.

Figure 1- Flow Process Mediation Model



Importantly, as I suggest that fluency and absorption are highly related, I must demonstrate that the relationship between them can be broken. To do so, I will demonstrate that

fluency can be increased without a corresponding increase in absorption. I expect that I can thwart the relationship between the two by having participants engage with a task that is too easy. Engaging with a task that is too easy will facilitate a high degree of perceived fluency, but will not necessarily lead to absorption into the task. According to the original flow model in which there must be a balance between skills and task demands, since the task does not challenge the person's skills enough they will likely become bored rather than absorbed (Csikszentmihalyi 1975).

Hypothesis 3: The relationship between fluency and absorption will be thwarted in tasks that are too easy

In the next chapter I present three studies that test my proposed hypotheses and flow process model. In Study 1 I provide initial evidence of the flow process model by having participants listen to a song after which I measure fluency and absorption. In Study 2 I replicate the model by having participants read a story and I manipulate fluency and absorption. In Study 3 I demonstrate how to shut off the relationship between fluency and absorption by increasing fluency without absorption.

CHAPTER 3

EXPERIMENTAL STUDIES (ESSAY 1)

STUDY 1: THE FLOW PROCESS LISTENING TO MUSIC

Design

In Study 1 I seek to provide initial support for my proposed flow process model which suggests that fluency facilitates absorption to create perceptions of being in flow. Stated differently, this model suggests that fluency initiates the flow process and facilitates absorption, which determines whether one perceives they have experienced flow. In an effort to show consistency with the extant literature I also seek to demonstrate that involvement, which is a known antecedent to flow (Hoffman and Novak 1996) facilitates fluency and the flow process. Involvement, which can be depicted by personal relevance as determined by individual needs, wants and motivations (Zaichkowsky 1985) will provide the required intrinsic motivation to succeed in a task/experience (i.e. find fluency) long enough to the point of reaching flow. This study followed a quasi-experimental design such that participants (N = 106 Mturk workers, M_{age} = 32.47, 58.5% male) all listened to a 3-minute clip of electronic dance music with no words and the variables were all measured after the experience. In this and all subsequent studies, after the manipulation, participants completed the dependent measures, followed by demographic measures and were then given a debriefing passage which explained the purpose of the study. In this study participants were then compensated a monetary value of $1.00 USD for their time.

Measures

Dependent Measures. I assessed fluency using the flow fluency subscale (6 items, a = .855) and absorption using the flow absorption subscale (4 items, a = .795, Engeser and Rheinberg 2008). An example of fluency item is "my thoughts/actions seemed to happen naturally and on their own" and an example of an absorption item is "I was totally absorbed in the experience". It is important to demonstrate that fluency and absorption represented different components of the flow experience with this sample of participants and in this new context. In order to do so, I performed a factor analysis of the flow state scale with the goal of determining whether fluency and absorption loaded on the two factors suggested by Rheinberg et al. (2003).

In order to measure people's perceptions of whether they experienced flow overall, I used the flow questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988). The flow questionnaire gives participants three quotes which explain what it feels like to be in flow and asks if they experienced what the quotes described (yes/no). The yes/no answer to the flow questionnaire served as the ultimate measure of flow. I also wanted to explore the relationship between this overall measure of flow and fluency and absorption. The measure was included in the factor analysis. I assessed involvement using a 7-item scale (a = .964, Zaichkowsky 1985), anchored at 1 (not at all) and 7 (very much so) using the following items: unimportant/important, of no concern/of concern, irrelevant/relevant, means nothing to me/means a lot to me, useless/useful, worthless/valuable, doesn't matter/matters to me. See Appendix A for the full measures, including the quote descriptions.

Results

Mediation. I ran several serial mediation models to test my proposed flow model, the alternate model and that involvement is an antecedent to the process. First, I sought to test my proposed model that fluency leads to absorption which gives rise to a flow experience using Model 4 of the SPSS PROCESS macro (Hayes 2012). The model with fluency leading to absorption to flow was significant [*B*= .2561, S.E.= .1174, 95% C.I. .0780, .5456]. Importantly, the alternate model of absorption leading to fluency to flow was not significant [*B*= -.0221, S.E.= .0627, 95% C.I. -.1657, .0914]. These results suggest that fluency gives rise to absorption, which mediates the ultimate perception of whether one experienced flow or not. That is, fluency initiates the process, but absorption is critical to perceiving one was in flow.

In order to demonstrate consistency with prior findings, I also sought to demonstrate that involvement is an antecedent to the flow process. Using Model 4 of the SPSS PROCESS macro, the model of involvement leading to fluency leading to absorption was also significant [*B*= .0511, S.E.= .0392, 95% C.I. .0021, .1586]. Together these results provide initial support for the flow process model with measured variables. In Appendix D I have included another study which replicates the findings of Study 1 by manipulating involvement instead of simply measuring it. Appendix D also includes the measures used in that replication study.

The results of the factor analysis using a Varimax rotation supported previous research suggesting that the flow state scale has two components: fluency and absorption. Each of the ten items loaded onto their respective component as suggested by the flow state scale, with the exception of "I had no difficulty concentrating." This item loaded onto a third component with an eigenvalue of .850. However, its eigenvalue for the fluency component, which it is theorized to load on was .414 and its eigenvalue for absorption component was .240. As only one item did

not load on its proper component and that it loaded on a third factor, I suggest that this provides support for the discriminant validity between fluency and absorption.

In the mediation model I suggest that the two distinct components of flow- fluency and absorption, lead to the overall judgement of being in flow. It is somewhat problematic from a measurement standpoint to suggest that the two components of flow lead to an overall assessment of flow. This is supported from the results of the factor analysis which demonstrates that the overall judgement of being in flow (yes/no) loads onto the absorption component of flow. The implications of this finding are discussed in detail in the general discussion.

STUDY 2: MANIPULATING THE FLOW PROCESS THROUGH A STORY

Design

In Study 2 I seek to replicate the previous findings related to the flow process model by directly manipulating fluency and absorption. I suggest that if I manipulate fluency it will give rise to absorption which will give rise to perceptions of experiencing flow. I also seek to provide support against the alternative model by demonstrating that manipulating absorption will not increase fluency and subsequently flow. The purpose of including the absorption manipulation is thus to provide support against the alternative model that it will also increase fluency. In this study I change the flow-inducing task from listening to a song to reading a story. To manipulate fluency, participants (N = 199 Mturk workers, M_{age} = 33.68, 57.3% male) were asked to read a story in a light blue (disfluent) or black (fluent) font on a white background which is an established manipulation of processing fluency (Schwarz 2004). The duration of the task was manipulated as a means to control the level of absorption. Participants either read the story for 15

seconds (low absorption) or 45 seconds (high absorption), thereby creating a 2(fluency: high vs. low) x 2(duration: short vs. long) between-participants design. See Appendix B for all of the measures and stimuli. Participants in this study were compensated a monetary value of $1.00 USD for their time.

Measures

Manipulation Check. The fluency manipulation was assessed using the flow fluency subscale (6 items, a = .904) and the effectiveness of the time manipulation on absorption was assessed using the flow absorption subscale (4 items, a = .828, Engeser and Rheinberg 2008).

Dependent Measure. In order to determine whether participants felt they experienced flow overall (yes/no) I used the flow questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988). As in Study 1, given the nature of the mediation model that I am testing, I sought to demonstrate the discriminant validity between its components: absorption, fluency and the overall perception of being in flow (yes/no). In the same way as Study 1, I conducted a factor analysis to assess this.

Results

Manipulation Checks. A 2x2 ANOVA on fluency revealed only a main effect of the fluency manipulation. Those who read the story in the black font had a more fluent experience (M= 5.23) than those who read the story in the light blue font (M= 4.76, F(1, 196)= 6.35, p = .013). A 2x2 ANOVA on absorption revealed main effects of both absorption and fluency. Those who read the long story were more absorbed (M= 4.46) than those who read the short story (M=

3.91, F(1, 196)= 8.41, p= .004). Those who read the story in the black font were also more absorbed (M= 4.38) than those who read the story in the light blue font (M= 3.98, F(1, 196)= 4.39, p = .037). The finding that a traditional fluency manipulation also influences absorption supports my flow process model that fluency facilitates absorption. I support this further using mediation analyses.

Mediation. I ran several mediation models to test the flow process model. First, I sought to demonstrate that fluency as manipulated leads to absorption and flow. To test this, I ran Model 4 of the SPSS PROCESS macro (Hayes 2009) with flow coded as 0 and 1 to account for the dichotomous variable as the PROCESS MACRO is compatible with dichotomous variables coded in this manner. The model from fluency to absorption to flow was significant [*B*= .2618, S.E.= .1452, 95% C.I. .0147, .5924]. Importantly, the alternative model from absorption to fluency to flow was not significant [*B*= -.0608, S.E.= .0568, 95% C.I. -.2233, .0105]. These findings replicate the flow process model shown in Study 1 by manipulating fluency and absorption directly. Moreover, this study demonstrates a novel way to manipulate flow through its subcomponents of fluency and absorption.

Again, the results of the factor analysis using a Varimax rotation supported previous research suggesting that the flow state scale has two components: fluency and absorption. In this sample, each of the ten items loaded onto their respective component as suggested by the flow state scale. Again, the overall judgement of being in flow (yes/no) loaded onto the absorption component of flow.

Discussion

To this point I have demonstrated a flow process model in which fluency gives rise to absorption which mediates people's perceptions of whether or not they have entered flow. I have demonstrated this process both as facilitated by a traditional flow antecedent (i.e. involvement) and by manipulating fluency directly. Next my goal is to demonstrate how to shut off the path between fluency and absorption.

STUDY 3: THWARTING FLOW

As I have shown to this point, the fluency of a task facilitates absorption and flow. The primary goal of Study 3 is to shut off the path between fluency and absorption. To do so, I will attempt to increase fluency without significantly increasing absorption. I use task difficulty to demonstrate that fluency does not necessarily give rise to absorption. If a task is too easy, it will be fluent but will not require full attention. Despite the ease of the task increasing fluency, it will not necessarily increase absorption as people will be bored if the task demands are too low for one's skillset (Csikszentmihalyi 1975). That is, when a task is too easy, although one will experience a high level of fluency, the incremental fluency will not necessarily give rise to significantly increased absorption because full attention is not demanded by the task.

Design

In Study 3 I demonstrate this by having participants (N = 66 undergraduates, M_{age} = 19.68, 51.5% male) solve a Sudoku puzzle. Participants either worked on an easy or hard Sudoku puzzle, thus this was a one-way between-participants design with fluency manipulated. I expect to find the same relationship between fluency and absorption that I have shown to this point in

the difficult condition. However, in the easy condition I expect the relationship between fluency and absorption to be non-significant. That is, the increase in fluency in the easy condition will not result in a significant increase in absorption. See Appendix C for all of the measures and stimuli, including the Sudoku puzzles. Participants in this study were compensated partial course credit for their time.

Measures

Manipulation Check. The manipulation of difficulty was assessed by counting how many correct answers the participants had on their Sudoku puzzles.

Dependent Measures. Fluency and absorption were assessed in the same way as the previous studies using the flow fluency subscale (6 items, a = .695) and the flow absorption subscale (4 items, a = .771, Engeser and Rheinberg 2008).

Results

Manipulation Check. The results of an independent samples t-test between the two conditions on the number of correct answers was significant such that those in the easy condition got significantly more answers correct on the Sudoku puzzle (M= 32.71) than those in the hard condition (M= 10.45, t(62)= 12.72, $p < .001$).

Dependent Measures. An independent sample t-test between the two conditions on fluency was significant such that those in the easy condition had a more fluent experience working on the Sudoku (M = 6.11) than those in the difficult condition (M = 4.69, t(62)= 5.10, $p < .001$). There was no statistically significant difference between the conditions on absorption,

those in the easy condition did not statistically differ in the degree to which they were absorbed (M= 4.92) relative to those in the difficult condition (M = 4.48, t(62)= 1.41, p = .16).

Moderation. I ran a moderation analysis using Model 1 of the SPSS PROCESS macro (Hayes 2012) to demonstrate that fluency and absorption had a significant positive relationship for those who worked on the difficult Sudoku puzzle but not for those who worked on the easy Sudoku. The results confirmed this by demonstrating that the relationship between fluency and absorption was significant in the hard condition [*B*= .5345, S.E.= .1698, 95% C.I. .1949, .8741] but not in the easy condition [*B*= .3564, S.E.= .2005, 95% C.I. -.0447, .7576].

Discussion

Across the first two studies I provide support for my flow mediation model that fluency facilitates absorption which mediates the overall perception of being in flow. In the third study I also demonstrated how to shut off the relationship between fluency and absorption. The implications of these findings are discussed together in the general discussion section along with the findings of Essay 2. I use the knowledge gained from this set of studies to facilitate flow in Essay 2.

CHAPTER 4

HOW DOES FLOW BENEFIT MARKETERS? (ESSAY 2)

The second overall objective of this dissertation research is to develop the literature's understanding of the breadth of outcomes that flow can have for marketers. The literature has focused on the role of flow in an online context so this research helps to develop an understanding of how flow can be facilitated in different marketing contexts. This research specifically focuses on the positive impact of flow in the context of product trials. Building from the findings of Essay 1, I explore how to facilitate flow in product trials. I focus on the ability of curiosity to facilitate flow in the product trial context and explore how curiosity is related to flow's components fluency and absorption. I will start this chapter with a discussion of some findings related to the consumer-related outcomes of flow. Following that I explore the literature on curiosity and develop a model for its relationship with flow. Since I am concerned with creating flow overall and the outcomes it has for marketers, I will measure and evaluate flow as such in the studies, opposed to explicating the individual components as I did in Essay 1 when the focus was on the relationship between the two components.

LITERATURE REVIEW

The flow construct is popular in the virtual and interactive gaming literature where it is used as a theoretical approach to understand the critical components of game enjoyment (Sweetser and Ryeth 2005). Elsewhere, flow has been demonstrated to drive positive outcomes such as enjoyment and success in such environments as learning (Pintrich 2003), sports (Briki, Den Hartigh, Markman, Micallef, and Gernigon 2013), work and leisure (Csikszentmihalyi and

Lefevre 1989) and everyday life (Csikszentmihalyi and Rathunde 1993). Flow, as it gives rise to meaningful enjoyment and true happiness is renowned as an important area for future research (Fredrickson 2001).

Research on flow within consumer behavior has been almost exclusively limited to the online context. Flow has been examined in relation to such topics as internet shopping (Smith and Sakumar 2004), online media enjoyment (Sherry 2004), and online consumer behavior (Koufaris 2002). In their seminal article, Hoffman and Novak (1996) proposed a conceptual framework of flow in the interactive online world. The framework proposed several outcomes of flow: increased learning, increased perceived behavioral control, increased exploratory behavior, positive subjective experiences, and potential negative consequences given excessive time spent in the flow state.

Several of these propositions have been supported along with new mechanisms. In regards to the consequences of flow, Korzaan (2003) found that flow directly led to increased exploratory behavior and Skadberg and Kimmel (2004) found that flow lead to increased learning while visiting a website. An important stream of research has begun to consider the positive consequences that flow has on attitudes, including attitudes toward purchasing online (Korzaan 2003), brands (Sanchez-Franco 2006) and websites (Tomaseti, Ruiz and Reynolds 2008). Flow has also been found to positively influence online purchase intentions (Luna, Peracchio, and de Juan 2003). Novak, Hoffman, and Yung (2000) demonstrate that flow can lead to decreased price sensitivity and positively influence subsequent attitudes and behaviors.

In this research I seek to build from the prior findings and extend the consequences beyond the online context and into the product trial context. Following the positive consequences of flow for product attitudes in the online context as discussed earlier, I suggest that experiencing

flow in a product trial will significantly increase product attitudes and the desire to engage with that product again. These are important marketing outcomes for organizations when using product trials as a marketing tactic.

Hypothesis 4: Experiencing flow during a product trialing will enhance product attitudes and the desire to engage with that product again.

In an effort to explore the outcomes of flow in product trials I explore how to facilitate flow in that context. Given the exploratory nature of product trials and the acquisition/learning of information I suggest that curiosity is a particularly relevant factor to explore. I explain curiosity and its relationship with flow below.

CONCEPTUAL DEVELOPMENT

Several theoretical approaches to the underlying cause of curiosity have been offered, including internally-evoked optimal arousal accounts (Day 1971) and externally-evoked drive-based accounts (Berlyne 1950; Fowler 1965). More recent theoretical advancements include the information gap account which is an amalgamation of both drive and arousal theories (Loewenstein 1994) and the interest/deprivation model (Litman and Jimerson 2004). Despite the varying theoretical approaches to the underlying mechanism, they share the view that curiosity is as a desire for information and sensory experience that motivates one to explore (Litman and Spielberger 2003). Moreover, they suggest that curiosity is derived from a switch in perspective from what is known to what is unknown.

When people feel curious, they devote more attention to an activity, process information more deeply, remember information better, and are more likely to persist on tasks until goals are met (Silvia, 2006). Curiosity can be perceived as a feedback loop which builds on answers to questions or progress towards a goal such that positive feedback or progress gives rise to more search (Loewsentein, 1994). The immediate function of curiosity is to learn, explore, and immerse oneself in whichever activity initially stimulated the deployment of attentional resources (Loewenstein, 1994). The information-gap model (Loewenstein 1994) suggests that curiosity follows an inverted-U function based on the knowledge of a topic such that if they have no information they will not be curious, but as they obtain some knowledge they will experience rising curiosity which peaks at a certain point of knowledge and decreases to a point where someone is highly knowledgeable and less curious.

With regards to its role in consumer behavior, curiosity has been studied as an antecedent to novel consumption behavior in a variety of stages of the consumer decision making process, from information search to the actual purchase of goods. Researchers have explored the role of curiosity in the advertising context, demonstrating that curiosity-generating advertising strategies increase interest and learning of that strategy (Menon and Soman 2012). Specifically, the authors demonstrate that curiosity-generated advertising result in more focused memory and comprehension of product information. Research has also suggested that curiosity facilitates consumers' seemingly counterintuitive engagement in services that require them to do the work instead of an employee, such as self-checkouts (Cochoy 2014).

Research has posited the motivational link between curiosity and flow such that curiosity should be an antecedent of flow as it provides a motivational force to know more and explore (Webster et al. 1993). Huang (2006) suggests that curiosity is an important element of the flow

experience and that its link to attention should be tested empirically. I build from these propositions by testing them empirically and understanding the relationship between curiosity and flow as it pertains to fluency and absorption.

Hypothesis 5: Curiosity about a stimulus will have a positive relationship with experiencing flow while engaging with it.

Although it seems evident that curiosity should facilitate greater attention to the task (Kahneman 1973) for the purpose of obtaining information, it does not necessarily follow that an individual will experience flow. As demonstrated in the results of the first essay, fluency facilitates absorption and flow. If the search for and acquisition of information is not fluent, curiosity should not give rise to flow. I suggest that although curiosity and flow should have a positive relationship overall, the valence of information that elicits curiosity will influence processing fluency and subsequently flow.

The valence of information that elicits curiosity should influence the ease with which that information will be processed when it is acquired. I suggest that positively-valenced information should give rise to a more fluent experience than negative information. One factor that will influence the ease with which information is processed in this context is consistency. Consistency is based on cognitive elements being tied together (Heider 1946) and it increases perceptions of fluency while processing (Winkielman, Huber, Kavanagh, and Schwarz 2012). In order for someone to have a fluent experience while acquiring information, the valence of that information should be consistent with prior beliefs (i.e. information given to them) as consistency will lead to information processing being perceived as easier, faster, and/or

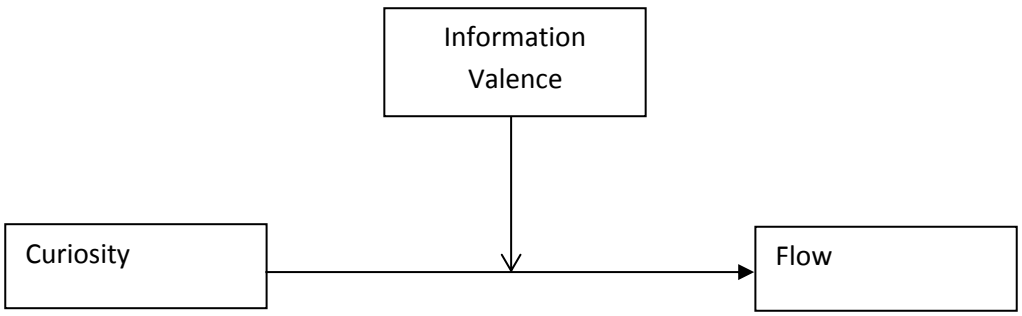
smoother. This means that if someone is going to experience fluency, and subsequently flow (which is a positive experience), the information eliciting curiosity should be positive.

To illustrate this theorizing with an example, giving positively-valenced information about a song (i.e. song reviews) will prime people to believe that it is good, and when they experience it as neutral or positive the information will be perceived as fluent as it is consistent with their prime. However, if the given information is negatively-valenced, processing it will be perceived as less fluent.

Hypothesis 6: Curiosity elicited from positively-valenced information will lead to a stronger flow experience than curiosity as elicited by negatively-valenced information.

In summary, curiosity should have a positive relationship with flow overall. However, the valence of information that elicits curiosity should moderate the relationship. Positive information should elicit a more fluent experience of information acquisition relative to negative information. The fluency of that experience will drive flow. The model is depicted below and will be tested in the studies in Chapter 5.

Figure 2: Curiosity/Flow Moderation Model



I will test the aforementioned hypotheses related to manipulating flow and the outcomes it has through a series of three studies. In Study 1 I will provide support for Hypothesis 4 by demonstrating the mediating effect of flow on the desire to use a product after testing it. In Study 2 I will provide further support for Hypothesis 4 in the context of testing an augmented reality game prototype. In Study 2 I also support Hypothesis 5 by facilitating flow through the manipulation of curiosity. In Study 3 I provide support for Hypotheses 5 and 6 by demonstrating that the positive relationship between curiosity and flow is moderated by the valence of information that elicits curiosity. In the context of listening to music, providing negative song reviews increased curiosity before listening but led to a disfluent experience of processing information relative to positive song reviews which limited flow.

CHAPTER 5

EXPERIMENTAL STUDIES (ESSAY 2)

STUDY 4: THE OUTCOME OF FLOW IN A PRODUCT TRIAL (ROWING MACHINE)

Design

The goal of Study 4 is to demonstrate that experiencing flow in a product trial context will mediate an increase in the desire to engage with that product again. Typically, a salesperson will stay with a customer and explain the product to them while they try it out. In Study 4 I seek to demonstrate that social presence can limit flow when trialing a product and can have a negative effect on the desire to use that product again. Social presence should be distracting to the consumer as they try to row, consistent with research showing the negative effect of a social presence on performance of complex tasks or tasks that haven't been mastered (Bond and Titus 1983). In line with the theorizing in Essay 1, by limiting the ability to pay attention to the task at hand, and thus limit the most critical component of flow- absorption (Schiefele 2012). To do so I simulated a shopping experience in which participants (N = 74 undergraduate students, M_{age} = 20.74, 68.9% male) came to shop for workout equipment and were looking for a rowing machine. Participants were recruited in the business school and compensated $5.00 CDN for their time.

To start the shopping experience customers (participants) entered a room and were greeted by a salesperson (a research assistant). The salesperson took them to a rowing machine and explained how to use it. The salesperson told the participants to simulate a workout on the rower for two minutes to get a feel for the machine. After that, the salesperson either stayed with

the customer while they rowed or went across the room to sit down at their desk. This created a 2-cell (social presence: yes vs. no) between-participants design. I expected that the social presence of the salesperson would be distracting to the customer while trying to row, which would limit flow and mediate a negative impact on the desire to use that product again. See Appendix E for all of the measures.

Measures

Manipulation Check. To assess the social presence manipulation I asked participants whether the salesperson stood beside them while they were rowing or not (yes/no).

Dependent Measures. I expected that a social presence would be distracting to the customer. To assess distraction I used two items (r= .727) on scales from 1(not at all) to 7(very much so) asking "to what degree was the salesperson… distracting/ disrupting". Flow was assessed using the flow state scale (10 items, a = .760, Engeser and Rheinberg 2008). Lastly, to assess attitudes towards the rower, participants were asked: "how likely would you be to use a rower like that again?" (1=not at all likely, 7= very likely).

Results

Manipulation Check. To test the social presence manipulation I conducted a Chi-Square test of independence between the two conditions on whether or not the salesperson stood beside them. The results were significant such that a higher percentage of people in the social presence condition reported that the salesperson was standing beside them while they were rowing (97.4%) than those in the no-social presence condition (10.95%, $X^2(1, 76) = 57.68$, $p < .001$).

Dependent Measures. I ran independent sample t-tests between the two conditions on each of the dependent measures. The results of the analysis on distraction were significant, such that those in the social presence condition perceived the salesperson to be more distracting (M = 1.71) than those in the no social presence condition (M = 1.10, t(72)= -3.37, p = .001). However, those in the social presence condition did not differ overall in flow (M_{flow}= 4.83) or their desire to use the rower again ($M_{UseAgain}$= 5.39) from those who rowed without the social presence (M_{flow} = 4.76, t(72)= -.332, p = .741; $M_{UseAgain}$ = 5.50, t(72)= .310, p = .758).

Mediation. The goal of this study was to demonstrate that flow mediates the desire to engage with the product that is being tested. I expected to find that the distraction caused by a social presence would limit flow and in turn mediate a decrease in the desire to use the rower again. To assess this I ran Model 6 of the SPSS Process macro (Hayes 2012). The analysis was significant such that the serial mediation path through distraction and flow was the only significant model (*B*= -.0684, S.E.= .0540, 95% C.I. -.2577, -.0051).

In this study I demonstrate that flow mediates consumers' desire to engage with a product after testing it. The results suggest that the social presence of a salesperson can be distracting while trying out a product which has a negative influence on flow and ultimately the products they are selling. Although there were no main effect differences in flow, I suggest that this is due to the conservative operationalization of the social presence of the salesperson. This social presence did not distract the consumer with particular sales tactics in this study, they simply stood there. I expect that there to be stronger main effect differences in flow and subsequent desires to use the rower again if the salesperson engaged in more disruptive selling behavior. Importantly I demonstrate the desired mediating effect of flow on the desire to engage with the product again.

STUDY 5: THE OUTCOME OF FLOW IN A PRODUCT TRIAL (AUGMENTED REALITY)

Study 5 has two goals. First was to replicate the findings of Study 1 by testing a new product (an augmented reality game). The second goal of Study 5 was to manipulate curiosity in an effort to demonstrate that curiosity facilitates flow. For this study I collaborated with a local app developer who was creating a game for mobile devices that features augmented-reality technology. I used the beta version of their augmented-reality game as the experimental stimuli.

Design

This study proceeded according to the following sequence of measures: curiosity manipulation (information) → curiosity measure → play the video game → flow measure → dependent measures. Following the information gap theory of curiosity (Loewenstein 1994), I used an information manipulation of curiosity. Participants were randomly assigned to one of two conditions: the group in the first condition received a half-page of information about augmented reality (AR) technology, and those in the second condition received a half-page of information about the new campus gym as a control. This structuring of the participants created a two-cell design based on the information received: augmented reality vs. gym. It is important to note that this information did not tell them how to play the game; rather, it gave them initial information about what the technology does and how it works. See the appendix for the full information passages.

In order to run the study I borrowed iPads and iPhones with the application loaded on them from the company we collaborated with. The application was a tower-defense game called *Clandestine Anomaly* that incorporated the player's actual surroundings into the gameplay using

augmented reality software and the device's camera. The game incentivized players to move around in their real-world surroundings to uncover different aspects of the game, such as advanced weaponry. Participants (N = 51, M_{age} = 20.68, 72.3% male) were recruited on campus and the trials were run in a campus gymnasium. Participants were compensated $10.00 CDN for their time.

Participants were then told that they were testing a game from a local developer and that we would let them play it for 20 minutes. After receiving the information manipulations and playing the game, the participants completed questions related to curiosity. After playing the same, participants were thanked and were asked to complete the final questionnaire which asked them how much they knew about augmented reality prior to playing the game (1= nothing, 7 = A lot). The average was 3.28, which indicates that the technology was relatively unknown to this group and served as an opportunity to understand how to influence product trial success. The follow-up questionnaire also asked questions related to flow and demographic variables such as age, gender, and previous gaming experience in addition to other measures for the company. See Appendix F for all of the stimuli and measures including the manipulations and pictures of the game.

Measures

Manipulation Check. Curiosity was measured using the state curiosity items from the state-trait personality inventory (10 items, *a* = .788, Spielberger et al. 1979) on a 4-point scale, anchored at 1 (not at all), 2 (somewhat), 3 (moderately), 4 (very much) with the following items: I feel: curious, bored (r), disinterested (r), like exploring my environment, in a questioning mood, eager, inquisitive, interested, stimulated, and mentally active.

Flow. Flow was measured using both the flow state scale (10-items, a = .855) and the flow questionnaire (Csikszentmihalyi and Csikszentmihalyi 1998).

Dependent Measure. With regards to consequences for marketers, I used two measures: attitudes towards the game and the desire to play again. Attitudes towards the game were assessed using three items on 7-point scales with the following poles: bad/good, negative/positive, dislike/like (a= .949). Desire to play the game again was assessed by asking "to what degree would you want to play this game again?" (1=not at all, 7= very much so).

Results

Manipulation Check. An independent sample t-test between the curiosity conditions was significant such that those in the AR information condition were significantly more curious (M= 3.85) than those in the gymnasium information condition (M= 3.61, t(49)= 2.07, p= .044).

Flow. An independent sample t-test on the flow state scale was significant such that those in the high curiosity condition reported a stronger flow experience (M= 5.14) than those in the low curiosity condition (M= 4.35, t(34.20)= 2.57, p= .015). The Levene's test for equality of means in the t-test for flow was significant (SD_{AR}= .81, SD_{Gym}= 1.25, F= 6.05, p = .018) so I used the analysis with equal variances not assumed. I also ran a binary logistic regression on the likelihood of entering flow. Those who were in the curiosity condition were more likely to enter flow than those who were in the low curiosity condition (b= -1.75, S.E.= .75, Wald= 5.47, p = .02).

Consequences of flow. In order to determine the influence of flow on the marketing related consequences I ran mediation models (Model 4 in the SPSS Process Macro) with flow as the mediator of the relationship between curiosity and the outcome variables (Hayes 2009). The

results indicated that flow mediated the relationship between curiosity and an increase in both the game evaluation [*B*= .8436, S.E.= .3616, 95% C.I. .2352, 1.6952] and the desire to play again [*B*= .7426, S.E.= .3835, 95% C.I. .1526, 1.6652].

Discussion

Study 5 demonstrates that flow mediates an increase in attitudes towards the augmented reality game that was being tested and the desire to engage with it again. It also demonstrates that curiosity increases the strength of flow and the overall likelihood of entering flow. Importantly, curiosity is manipulated in this study which allows us to imply a causal relationship between curiosity and flow. The context of this study speaks to the importance of information as it relates to new product adoption. A half page of information about the experience was enough to increase curiosity and increase the strength of flow in that experience. This has implications for marketers when releasing products that are relatively unknown. In accordance with the information-gap theory (Loewenstein 1994), the gap of information must be reduced to maximize motivation to learn about the product.

STUDY 6: MODERATING THE RELATIONSHIP BETWEEN CURIOSITY AND FLOW

The goal of Study 3 is to moderate the relationship between curiosity and flow. Specifically, my moderation model suggests that eliciting curiosity using negatively-valenced information should limit the fluency of processing information and subsequently flow. While I expected that negatively-valenced information would increase curiosity, the processing of that information would be disfluent relative to processing that is initiated by positive information.

Pretest Design, Measures and Results

I first needed to find both negative and positive information that would elicit levels of curiosity that were not statistically significantly different. I also needed to find a way to thwart curiosity after eliciting it. I chose the context of listening to a song and gave participants positive or negative reviews of that song to elicit curiosity. I suggest that the positive and negative reviews will not differ in the curiosity about what the song is going to sound like. Furthermore, based on the inverted-U hypothesis of curiosity, giving participants a long sample of the song should satisfy that curiosity.

I designed a pretest to demonstrate that both positive and negative information should elicit levels of curiosity that were not statistically significantly different, and that providing a preview of the song should satisfy their curiosity. In order to test this, I ran a 2 (review valence: positive vs. negative) x 2 (curiosity: song preview yes vs. no) between-participants design. The pretest was conducted according to the following sequence of measures: curiosity manipulation (song reviews and preview) $\rightarrow$ curiosity measures $\rightarrow$ listening to music $\rightarrow$ demographic measures.

Participants (N= 219 Crowdflower online panel workers, M_{age}= 34.57, 49.8% male) either received two positive or two negative reviews of the song (see Appendix F for descriptions), and they either went straight to the song after the reviews or were given a 30 second preview in an effort to thwart curiosity. The reviews discussed the same aspects of the song, but they differed in that one set of reviews viewed these aspects positively while the other set took a more negative view. Before listening to the song, curiosity was assessed using 2 items (r= .872, Wang 2014) which were used in this study to support a more consolidate measure of

curiosity: “I am curious about the song”, and “I am eager to hear the song” (1=not at all to 7=very much so). After listening to the song, participants were asked to provide demographic information about their age and gender. Participants were compensated a monetary value of $0.80 CDN for their time.

I ran a 2 (valence) x2 (curiosity) ANOVA on curiosity. The analysis revealed only a main effect of song preview ($F(1, 215)= 5.13$, $p= .024$). Participants who were given a preview of the song were less curious about the song ($M= 4.78$) than those who went directly to the song following the reviews ($M= 5.28$). Curiosity levels for those who were not given a preview did not significantly differ between those who were given positive reviews ($M= 5.30$) and those who were given negative reviews ($M= 5.26$, ($F(1, 215)= .018$, $p= .89$). Taken together, these analyses support the efficacy of the song reviews as curiosity manipulations and the song preview as one way to satisfy curiosity. Moreover, the analyses demonstrate that the positive and negative reviews elicited levels of curiosity that did not significantly differ.

Main Study Design

The main study proceeded according to the following sequence: curiosity manipulation (song reviews and preview) → listening to music → flow measures → demographic measures. I ran the same 2 (valence) x2 (curiosity) between-subjects design as in the pretest, only this time I did not assess curiosity before listening to the song to prevent any demand effects. After listening to the song, participants ($N= 212$ Crowdflower online panel workers, 48.6% male, $M_{age}= 36.02$) completed a questionnaire which included the dependent measures and demographic information related to age and gender. See Appendix F for all of the measures. Participants for the main study were compensated a monetary value of $0.80 for their time.

Measures

Manipulation check. The manipulations were assessed using two items (r= .967) asking participants "were the reviews of the song that you read before listening…negative (1) /positive (7), and bad (1) /good (7)".

Flow. Flow was measured in two ways. First, I used the flow-quote method (yes/no). In order to provide an additional analysis of the influence of curiosity on the fluency (6 items, a= .915) and absorption (4 items, a= .882) components of flow, I used the flow-state scale (10 items, a= .911). I suggest that curiosity elicited by positive information will lead to a more fluent experience than if curiosity is elicited from negative information. Nonetheless, I expect that in both cases absorption will not statistically significantly differ.

Results

Manipulation check. A 2x2 ANOVA on the song reviews revealed only a main effect of valence (F(1, 209)= 223.27, p< .001). Those in the positive review condition suggested that the reviews provided about the song were significantly more positive (M= 6.25) than those in the negative review condition (M= 2.87).

Flow. In order to test the valence of information as a moderator of the relationship between curiosity and flow, I ran Model 1 of the PROCESS Macro in SPSS using 10,000 re-samples. I used this model because, like logistic regression, it allows a dichotomous (yes/no) dependent variable. The analysis revealed a significant interaction between curiosity and the valence of information (B= 1.408, *S.E.*= .5583, 95% C.I.= .1309, 1.6797). Analysis of the conditional effects of curiosity on flow for positive and negative information revealed a significant positive relationship between curiosity and flow for those who received positive

information about the song (*B*= .9053, *S.E.*= .3951, 95% C.I.= .1309, 1.6797) but a non-significant relationship when the information was negative (*B*= -.5028, *S.E.*= .3945, 95% C.I.= -1.2759, .2703). This suggests that curiosity as elicited by positive information leads to flow, but that curiosity from negative information does not.

In order to better support the moderation model and the process as it relates to fluency and absorption I examined the effects of the two curiosity conditions on the two constituent components of flow. A 2 (curiosity) x 2 (valence) ANOVA on the fluency subscale of flow revealed a significant interaction (F(1, 209)= 3.90, p = .050). A planned comparison of the two curiosity conditions suggested that those who were curious based on positive reviews had a more fluent experience (*M*= 5.10) than those who were curious based on negative reviews (*M*= 4.36, F(1, 209)= 7.70, *p*= .006). However, a planned comparison between the two curiosity conditions on the absorption subscale of flow suggested that those who read the positive reviews did not differ in absorption (*M*= 3.94) from those who read the negative reviews (M= 4.01, F(1, 209)= .065, *p*= .799). Together, these results suggest that curiosity arising from negative information does not enhance flow because it fails to elicit perceived fluency.

These findings are interesting when compared to findings on the relationship between fluency and surprise. Whittlesea and Williams (1998) demonstrate that moderately fluent processing is perceived as more familiar than highly-fluent processing when moderately fluent processing is surprising. Surprise may have an influence in our context, but the results are not the same. Although participants may have been surprised when they heard music that they liked after reading a negative review, the experience was still perceived as less fluent than for those who received a positive review and would not have been surprised.

Discussion

Together, the three studies in essay 2 demonstrate the effectiveness of flow in product trial contexts. Experiencing flow while testing a product mediated increases in both product evaluations and the desire to use the product again. The mediation findings were demonstrated while testing a variety of products; a rowing machine, an augmented reality game and a new song. The three studies also demonstrate how to facilitate flow in these contexts through curiosity. In Study 6 I demonstrated that although curiosity and flow have a positive relationship, it is moderated by the valence of information that elicits curiosity. The implications of these studies along with those in essay 3 are discussed below.

CHAPTER 6

GENERAL DISCUSSION

This research provides a new understanding of flow and the role that it can have in consumer behavior. Essay 1 focused on understanding flow where I demonstrate how the two components of flow, fluency and absorption, combine to elicit flow. Using that knowledge I demonstrate novel techniques to manipulate flow. I also demonstrate that the relationship between the two components of flow can be thwarted. In Essay 2 I use the knowledge of how to manipulate flow to facilitate it in the context of product trials and demonstrate the positive impact of flow for marketers. Through three experiments in the product trial context, this research supports a model in which curiosity increases both the likelihood of entering flow and the strength of the flow experience. I also demonstrate that this relationship is moderated by the valence of information that elicits curiosity. Essay 2 also demonstrates that in the context of

product trials, flow mediates increases in product attitudes and the desire to engage with products again.

The findings of Essay 1 have significant implications for the conceptualization of flow, how it is created and as a result, how flow should be studied moving forward. Research on flow has been limited due to a weak understanding of how to manipulate it. Consumer behavior researchers have suggested that we need a more nuanced understanding of flow from different theoretical perspectives (Novak et al., 2000; Hoffman and Novak 2009), and my dissertation research answers this call.

Essay 1 develops a two-component conceptualization of flow and demonstrates how to apply it across various contexts. I apply the model to successfully facilitate flow across a range of contexts from physical tasks to experiential tasks (listening to music) to more intellectual tasks (reading, Sudoku puzzles). The two-component model should facilitate research on flow by making it more suitable for experimental research and will allow researchers to imply causation related to flow, something the current literature lacks. Beyond applying the two-component model of flow this research makes the important distinction between *microflow* and *deepflow*, opting to focus on *microflow* states as they can be manipulated and still have positive outcomes for consumers and marketers. It is important for researchers to delineate moving forward whether they are dealing with *microflow* or *deepflow* in their research.

The research in Essay 1 provides several theoretical contributions beyond advancing the understanding of how flow is created. Consumer behavior research has not made the important distinction between *microflow* and *deepflow*. The focus on manipulating *microflow* leads to two novel predictions in how they differ from *deepflow:* first, people are likely to have a low level of prior knowledge related to the stimuli; and second, they may not necessarily have a positive

attitude towards the stimuli beforehand. By definition, people must have a degree of expertise and the requisite skills to engage with a complex task effectively in order to enter *deepflow*. In addition, because one has acquired a certain level of expertise regarding a task, they are also likely have a positive attitude towards it, which provides the necessary motivation to sustain their attention. My exploration of *microflow* is a novel contribution to the literature because it provides an opportunity to demonstrate the psychological process of entering flow in situations where participants can have little prior knowledge of the task and, consequently, can have relatively less inherent desire to engage in it.

My focus on *microflow* also contributes to the consumer behavior literature by illuminating the ability of marketers to manipulate flow. I demonstrate how to manipulate flow directly through its two primary components: absorption and fluency and how to facilitate both of those factors. The findings regarding methods of flow manipulation represent a contribution to the flow and consumer behavior literatures insofar as direct experimental manipulation of flow has been largely unexplored. Prior research has been limited in its ability to imply causation because it has not examined the manipulation of flow.

The findings in Essay 2 also have important implications for both theory and practice. By focusing on flow as a dependent measure, this research contributes to the consumer behavior literature by understanding new ways for marketers to add value for consumers in the product trial context. Flow, as elicited by curiosity, increased future intentions to use a product, and led to more positive product evaluations. These outcomes are made possible by curiosity, which has been largely overlooked. Recent research efforts have begun to explore the role of curiosity in consumer behavior (Wang 2014). The findings of Essay 2 represent a collective contribution to the consumer behavior literature for its illumination of the pervasiveness of flow in consumer

behavior and the ability of marketers to manipulate flow across a variety of contexts. This is an important discovery because flow research in consumer behavior has largely focused on the online context (e.g. Novak et al. 2000). The current set of studies was able to demonstrate practical tactics for manipulating flow by looking at relatively shorter flow experiences (*microflow*) which are more easily manipulated.

The Essay 2 findings contribute to the literature on flow by demonstrating the importance of one's cognitive motivation for entering flow, which transcends the matching of skills and task demands from the original flow model (Csikszentmihalyi 1975). Although one's skills will be a limiting factor in entering flow, we suggest that the cognitive motivation that one has about the task can help to overcome the strict ability/task-demand balance. Even though participants were listening to unfamiliar music or were using technology they had never used before (and thus had low skill levels), they were more likely to enter flow and to have a stronger flow experience by being curious.

These findings also contribute both theoretically and empirically to the understanding of the relationship between curiosity and flow. The findings extend the current literature, which proposes a positive correlation between the two. On a theoretical level, I explain the relationship between curiosity and flow by exploring the relationship between curiosity and the two primary elements of flow: absorption and fluency. Specifically, I demonstrate that curiosity facilitates the absorption component of flow, which helps to increase the likelihood of entering flow as it is the first critical component. However, as we also show, absorption only gives rise to flow if one perceives fluency. Although one may be motivated to search for information as a result of curiosity, if they do not perceive fluency in the acquisition of the information, flow will be thwarted.

This research also contributes to the literature on persuasion and attitude change. I demonstrated that participants experienced flow while listening to a relatively unknown genre of music and playing a completely unknown game. I used stimuli that were largely unfamiliar to our participants and was able to demonstrate a positive shift in attitude towards the stimuli. This is of particular interest because it shows that curiosity can be used to get participants to accept something outside of their current interest in a short period of time. Given the powerful attitudes that are formed towards music genres as a result of their importance to identity (North and Hargreaves 1999), this is a noteworthy finding.

The findings in Essay 2 also have important implications for practitioners regarding best-practices in product trial methodology and for the early stages of product release when little is known of a brand or product. The findings are especially notable within the context of customer acquisition from competing brands, as they demonstrate how curiosity can mitigate psychological barriers with respect to trying new products and how the experience of flow can be used to effect meaningful attitude change. It is important to note that, as a persuasion mechanism, flow provides an ostensibly unattainable 'win-win' situation for the company and consumers given the positive consequences for both in this context; entering flow is in the consumer's best interest because it leads to positive affect, while it also benefits the company as it leads to positive attitudes towards the stimuli which caused the consumer to enter flow.

The findings of this research also contribute to the growing literature on consumer happiness and wellbeing. Although consumer happiness and wellbeing is an important topic in consumer behavior research we appear to lack understanding of how to make the meaningful choices that bring long term happiness (Aaker 2014). Research has attempted to capture the keys to happiness by focusing on what type of purchases, mindsets and gestures that bring true

happiness. Research suggests that material things do not correlate with people's happiness and subjective well-being (Csikszentmihalyi, 1999; Diener, 2000), rather, research suggests that focusing on increasing meaningful personal correlations increases happiness. For example, research has demonstrated that giving time, not money makes people happier (Aaker et al. 2011), giving to others as opposed to oneself (Dunn, Aknin and Norton 2008; 2014) increases happiness as does spending money on experiences rather than material goods (Kumar, Killingsworth and Gilovich 2014). Despite all of this evidence we still continue to pursue happiness through consumption of material goods.

Perhaps the best place to look for an answer to increasing consumer happiness and well-being is the 2500 year-old tradition of mindfulness meditation (Didonna 2008). The ancient Buddhist tradition of mindfulness meditation promotes attentional control and bringing an open and accepting mindset towards whatever enters one's consciousness (Bishop et al. 2004). The message that can be taken from this approach which is supported by the current findings is that happiness can come from within via one's perspective of themselves and their environment. The current research demonstrates that the critical components to achieving mindfulness- attention control and an open/accepting mindset can be applied in a consumer behavior context to obtain positive outcomes for both consumers and organizations. Importantly, marketers can help consumers achieve this state and consumers can learn how to achieve it.

I suggest that promoting flow experiences can be an important contributor to consumer happiness by reducing the amount of time spent worrying, reducing stress, increasing mood and by providing the necessary skills to cope with negative emotions and cognitions (Baer 2003). Rumination and mood are key factors in increasing stress which leads to aversive health effects such as being sick (Salovey et al. 2000). More importantly, being able to control one's mental

state, a skill inherent of entering flow, is considered an important meta-cognitive skill which can be applied to varying contexts after one experiences it (Mayer and Salovey 1995). Such skills are the objective of clinical approaches to mental illness such as dialectical behavior therapy as they enable one to sustain emotional and physical health (Robins 2003).

A rich history of research has presented ways in which people can forgo maladaptive health-related behaviors, including Bandura's (1997) self-efficacy model and the strength model of self-control (Baumeister et al. 2007) amongst many others. This research provides practical value in behavior change through both a contextual approach and skillset development. In regards to contextual cues, information (or anything) that makes people more curious about things such as working out will improve the likelihood that they will enter flow while engaging in them and drive behavior change. Research has also demonstrated the efficacy of an open and accepting mindset in developing self-regulatory control as taught through mindfulness mediation (Bishop et al. 2004). My research supports this notion by demonstrating that in the context of consumer learning and new product adoption this mindset would be beneficial in regards to achieving flow.

FUTURE RESEARCH

This research opens the door for a myriad of possible flow-related projects. In this section, I discuss a few ideas that extend directly from each essay to further develop the literature on flow. Perhaps the most obvious extension of this research is to understand further the different ways that flow can be manipulated. Any variables related to perceived fluency, can be explored. Likewise, any variables related to absorption into an activity, such as emotions and mood, could prove to be fruitful manipulations and facilitators of flow.

It would be interesting for future research to explore further how the manipulation of fluency and absorption influence each other; if we manipulate fluency, when and how does that influence absorption, or vice versa. Understanding the degree to which they influence each other, and when, is perhaps the most interesting question for future study. Providing no fluency in a task should limit absorption. That is, making a task too difficult (zero fluency) will limit the participants' ability to become absorbed. More efforts to understand when/how the two influence each other may produce interesting findings. For example, exploring the degree to which absorption increases fluency and the degree to which fluency can help maintain absorption would be interesting. Exploring different types of interruption and their influence on both absorption and fluency would also be interesting. For example, a threat related to the task might increase absorption but could also have a negative influence on fluency.

Beyond exploring the relationship between fluency and absorption, research could also explore their relationship with the overall perception of being in flow (yes/no). The factor analysis in Essay 1 demonstrated that the overall perception of being in flow loaded on the absorption subcomponent of flow. This could be interpreted to suggest that when people determine whether or not they were in flow, they draw upon the absorption related elements. However, more research could be done to determine the validity of the flow questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988) and whether a new measure should be developed that is distinct from the absorption component.

To address any concerns related to the fact that the overall perception of being in flow loads on the same component as absorption, which mediated its effect, studies could focus on the relationship between fluency and absorption without looking at the general perception of being in flow (yes/no), but rather using another variable as an antecedent as demonstrated by using

involvement in Essay 1 and curiosity in Essay 2. The model could also be tested from the perspective of the outcomes of flow. For example, if you wanted to determine the effect of flow on purchase intentions, you could test the model of fluency—absorption—purchase intentions. If it is deemed appropriate to keep the overall judgement of being in flow in the model, studies could build upon what is found in Study 2 in this dissertation by simply manipulating fluency to determine its relationship with absorption and overall flow, as opposed to manipulating both. This provides more concrete support that it is fluency that facilitates absorption and subsequently flow.

Future research could also build on the notion that flow is a skill that can be developed by consumers. Given the underlying mechanism of attention in flow, it could be learnt much like meditation. This skill could be applied to help students in learning contexts, as flow is suggested to enhance learning (Pintrich 2003). It would also be interesting to see how telling consumers about flow would influence the experience. On one hand, it may take away from their experience because their focus might be split between the task and thinking about how to enter flow, while on the other hand it may provide them with the necessary information for entering flow. I hope that my research will spark more endeavors that consider the role that flow can play in driving positive outcomes for both consumers and marketers. Moreover, I hope that delineating the psychological elements of flow will open the door to gaining a better understanding flow from other perspectives. Given the potential that flow has for both consumers and organizations, I believe that such an expansion of the literature would be both fruitful and advantageous.

Due to its focus on *microflow*, this research is limited in its generalizability. However, future projects can also examine whether the same manipulation tactics work in *deepflow* contexts and how the relationships might be different. This research can also delve into the direct

manipulation of flow in other important and unique consumption-related contexts. It would be very interesting to understand the precise amount of time it takes to enter flow and at what time intervals the strength of flow significantly increases. Furthermore, other potential areas for exploration may include examining the important moderators to the amount of time to enter flow as well as individual and contextual factors, such as trait anxiety or crowdedness.

In this section I discuss several potential fruitful extensions of Essay 2, as well as a few particular ideas related to mitigating the shortcomings of this research. First, the research in Essay 2 is also limited in its generalizability given its focus on relatively short flow experiences (i.e. *microflow*). Future research could test the range of applicability of the types of flow experiences that curiosity facilitates. I suggest that, all else being equal, curiosity should facilitate a stronger flow experience, but it would also be interesting to see how curiosity's influence differs with *deepflow* experiences. Exploring *deepflow* might provide different motivational antecedents. For example, experiencing flow in longer-duration activities, such as pitching a baseball game, would require one to be engaged with every pitch, though for reasons for this engagement may not be attributable to curiosity. People experiencing *deepflow* would likely need a high level of expertise in about a given context. Based on the inverted-U hypothesis of curiosity (Loewenstein 1994), those with a very high level of knowledge would have limited curiosity, but would still be able to experience flow. Determining the keys for entering flow among those with high knowledge but low curiosity would be an interesting line of inquiry.

I demonstrate that curiosity facilitates flow, but it may also be the case that curiosity thwarts flow in certain contexts. That is, when one is presented with a task, curiosity related to that task increases flow while they are engaging with it. However, curiosity related to unrelated tasks or information would make it less likely to enter flow. For example, consider the influence

of cell-phones and social media on the ability to enter flow in other tasks. Perhaps the prominent pull of curiosity and the need to satisfy it could overshadow the ability to engage in flow in everyday life. Likewise, the relationship between curiosity and happiness would be interesting to understand as the constant desire to satisfy curiosity will leave people feeling less happy more often than not. Csikszentmihalyi's (2000) work suggests that total engagement in experiences reduces psychic entropy (disorganization), which is a key to creating happiness. Thus, while curiosity can help one to enter flow, it may also increase psychic entropy in the sense that the mind is constantly seeking new and alternative information.

Future research can also distinguish between different types of curiosity and their relationship with flow. Daniel Berlyne (1954; 1960; 1966) distinguished two types of curiosity based on the type of stimuli they are related to and the exploratory behaviors they elicit; he called them perceptual and epistemic curiosity. Berylne suggested that perceptual curiosity is a drive reduced by perception. He described it as being evoked by novel perceptual stimuli, primarily visual, which evoke interest in and compel one to give attention to the stimuli through inspection. Recent work has expanded Berlyne's focus on visual perception to include hearing, touching, smelling, and tasting (Collins, Litman, and Spielberger 2004). Perceptual curiosity is related to novelty-seeking through sensations (Zuckerman 1979). On the other hand, epistemic curiosity is described as a drive reduced by acquiring information. It is described as a drive to know, and is thus more related to seeking novelty through information (Spielberger and Star 1994). Research has determined that curiosity and its perceptual (Collins, Litman, and Spielberger 2004) and epistemic (Litman and Spielberger 2003) variants have both state and trait characteristics such that they can vary in intensity and that people vary in their predisposition to become curious in response to the different types of stimuli.

Berlyne (1960) also distinguished two types of exploratory behaviors related to curiosity: specific and diversive exploration. Diversive exploration is to "seek stimulation/information regardless of source or content" (p. 26), and specific exploration is aimed at a certain stimulus, not just to dispel uncertainties at the moment, but also to develop knowledge of it, much like obtaining an answer to a problem. Combining the two types of curiosity with the two exploratory behaviors provides four categories of curiosity: specific epistemic, diversive epistemic, specific perceptual, and diversive perceptual. For example, diversive epistemic curiosity is concerned with learning conceptual knowledge (e.g., exploring new ideas), whereas specific epistemic curiosity is concerned with seeking knowledge to solve a specific problem (e.g. an incomplete puzzle), (Litman and Spielberger 2003). The same distinction can be made between the types of diversive curiosity regarding specific perceptual stimuli versus general perceptual stimulation (Collins, Litman, and Spielberger 2004).

Berlyne's conceptions of the two types of curiosity and exploratory behaviors have remained to this day, but they are predominantly descriptive. In their interest/deprivation model of curiosity Litman and Jimerson (2004) delineate the emotional structure of epistemic curiosity by conceptualizing curiosity as generated by either interest or deprivation. In their model, interest-related curiosity involves pleasure associated with learning new information and gives rise to diversive exploration, while deprivation is associated with negative affect and spending time and effort to finding a solution to a problem and is thus specific exploration. The perceived deprivation of information involves higher levels of 'wanting' and involves more intense experiences of curiosity than interest-related curiosity (Litman 2005). Research has shown that different motives for learning predict the degree of effort and persistence individuals apply to

seeking new information (Elliot, McGregor and Gable 1999) as well the valence of the emotional experiences that follow (Sheldon and Elliot 1999).

Based on these findings, both forms of curiosity and exploration behavior should lead to flow because curiosity is self-reinforcing: once you feed it, it builds momentum, and the more information you get, the closer you get to your goal and the more motivated you become to reach it (Kahneman and Tversky 1979). In fact, in the online context, Novak et al. (2003) demonstrated that different types of activities can give rise to flow online. They found that both task-oriented and experiential online activities give rise to flow, which suggests that flow is more common to those engaged in task-oriented flow. However, the different types of curiosity would likely give rise to different types of flow experiences with regards to duration and intensity.

Future research should also consider the importance of exploring physiological data with respect to flow. In my proposal, I had anticipated using the emotive EEG headset. This avenue was pursued and upon further investigation and discussion with researchers who have used that particular technology it was determined that it would not be the best approach for my research questions. The data that was required related to the level of attention that participants were paying was not reliable as produced by the EEG mobile technology. Companies are still developing technologies to more efficiently and effectively collect physiological measures. I suggest that it would be an interesting avenue to pursue at some point when the measures have been perfected and reliable. The emotive EEG was originally suggested in an effort to better understand the process of entering flow. Importantly, this research question was answered through psychological variables in Essay 1.

CHAPTER 7

CONCLUSION

In conclusion, through two essays this dissertation provides insights into the process of entering flow and the role of flow in consumer behavior. In essay 1, through three empirical studies, I demonstrate the relationship between fluency and absorption and how they give rise to flow. Fluent elements of an experience give rise to absorption, which mediates whether people experience flow or not. In essay 2, through three empirical studies, I demonstrate that in the context of product trials, flow gives rise to increased desire to engage with the stimuli after the trial. Following the flow process developed in essay 1 I also find that there is a positive relationship between curiosity and flow that is moderated by the valence of information that elicits curiosity.

Essay 2 helps develop an understanding of the role that flow can play in consumer behavior beyond the online context. I am hopeful that this work will arouse more interest in this domain and inspire more research on flow. As evidenced by the wide variety of possible extensions of this work mentioned above, there is great potential to explore flow itself and as it pertains to different aspects of consumer behavior. Essay 1 provides researchers with a framework to develop more experimental work on flow by providing a flow process model and demonstrating how to manipulate it.

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CHAPTER 8

APPENDICES

Appendix A- Essay 1, Study 1 Measures

INFORMED CONSENT FORM

Researchers: Dr. Kelley Main, Associate Professor in Marketing, Ray Lavoie, PhD Student in Marketing, University of Manitoba, Canada.

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. Please take the time to read this carefully and to understand any accompanying information. This survey will take approximately 10 minutes and will consist of several parts which are explained below. After reading the description, please select either "Yes" or "No" corresponding to whether or not you wish to participate in the study. This study is trying to determine how different people listen to music. As such, we will ask you to listen to a 3-minute clip of music and to provide some information about yourself. By clicking to proceed, it indicates that you have understood to your satisfaction the information regarding participation in the research and agree to participate as a subject. In no way does this waive your legal rights nor release researches, sponsors, or involved institutions form their legal and professional responsibilities. In order to receive your compensation, you will have to proceed to the end of the questionnaire. If you decide to withdraw from the study prior to that time, please click through to reach the end. If you close the browser prior to reaching the end, you will not get compensated. Please be assured that your responses to all questions will remain completely confidential. There will be no access to data except by the researchers and in all final reports, your response will be anonymous. There is absolutely no way to trace your responses back to you. The data will be kept indefinitely. At the conclusion of the study, we will provide you with brief description of the study. For your participation in this research, you will receive payment. The results of this research are intended for academic purposes only at conferences and peer reviewed journals and is sponsored by SSHRC. The Joint Faculty Research Ethics Board at the University of Manitoba has approved this research. Should you have any complaints you may contact the Human Ethics Secretariat at [redacted] or e-mail [redacted]. The University of Manitoba Research Ethnics Board(s) and a representative(s) of the University of Manitoba Research Quality Management/Assurance office may also require access to your research records for safety and quality assurance purposes

- ❍ Yes, i agree to participate
- ❍ No, i do not agree

This study requires the use of headphones to listen to the music. Please put on the headphones to your right and listen to the following clip to adjust your volume to a level that is right for you. The play button

is on the left side of the grey bar below. Please move to the next page once your volume is adjusted, do not wait until the end of the clip, this is for volume adjustment only.

Before you move onto the progressive house song please answer the following questions related to how you feel right now. The song will be on the next page.

Involvement Scale (Zaichkowsky 1985)

To you, to what degree is the progressive house song you are about to hear...

	1	2	3	4	5	6	7
Unimportant:Important	❍	❍	❍	❍	❍	❍	❍
Of No Concern:Of Concern	❍	❍	❍	❍	❍	❍	❍
Irrelevant:Relevant	❍	❍	❍	❍	❍	❍	❍
Means Nothing To Me:Means Alot To me	❍	❍	❍	❍	❍	❍	❍
Useless:Useful	❍	❍	❍	❍	❍	❍	❍
Worthless:Valuable	❍	❍	❍	❍	❍	❍	❍
Doesn't Matter:Matters To Me	❍	❍	❍	❍	❍	❍	❍

Curiosity Items from the state-trait inventory (Spielberger et al. 1979)

Please identify how you feel right now before listening to the song

	Not At All	Somewhat	Moderately	Very Much
I feel curious	❍	❍	❍	❍
I feel bored	❍	❍	❍	❍
I feel disinterested	❍	❍	❍	❍
I feel eager	❍	❍	❍	❍
I feel like exploring my environment	❍	❍	❍	❍
I feel inquisitive	❍	❍	❍	❍
I feel interested	❍	❍	❍	❍
I am in a questioning mood	❍	❍	❍	❍
I feel stimulated	❍	❍	❍	❍
I feel mentally active	❍	❍	❍	❍

*Participants listen to the song clip right now

Flow State Scale (Engeser and Rheinberg 2008)

Please answer the following questions based on your experience while listening to that clip of music...

	Not At All			Partly			Very Much
My thoughts ran fluidly and smoothly	❍	❍	❍	❍	❍	❍	❍
I lost track of time	❍	❍	❍	❍	❍	❍	❍
I had no difficulty concentrating	❍	❍	❍	❍	❍	❍	❍
I was totally absorbed into the experience	❍	❍	❍	❍	❍	❍	❍
My mind was completely clear	❍	❍	❍	❍	❍	❍	❍
My thoughts seemed to happen naturally and on their own	❍	❍	❍	❍	❍	❍	❍
I knew what I was doing each step of the way	❍	❍	❍	❍	❍	❍	❍
I felt that I had everything under control	❍	❍	❍	❍	❍	❍	❍
I was completely lost in thought	❍	❍	❍	❍	❍	❍	❍
I felt just the right amount of challenge in	❍	❍	❍	❍	❍	❍	❍

understanding the clip							

Compared to other activities, listening to that music clip was

- ❍ Very Easy
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ Difficult

I think that my competence in the area of listening to the music clip is

- ❍ Low
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ High

For me personally, the demands of listening to that clip of music were

- ❍ Too Low
- ❍
- ❍
- ❍ Just Right
- ❍
- ❍
- ❍ Too High

Flow Questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988)

Please read the following quotes. The questions that follow are based on them.

“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 else. 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. When I start, I really do shut out the world. I am really quite oblivious to my surroundings after I really get going.

I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the world. Once I stop I can let it back in again. I am so involved in what I am doing. I don't see myself as separate from what I am doing."

Did you feel the experience that the quotes explained at ANY POINT while listening to the sound clip?

- ❍ Yes
- ❍ No

Rational/ Experiential Processing Scales (Novak and Hoffman 2009)

Please answer the following questions in regards to how you LISTENED TO THE SONG.

	Definitely false	Mostly false	Undecided	Mostly true	Definitely true
I reasoned things out carefully	❍	❍	❍	❍	❍
I tackled the task systematically	❍	❍	❍	❍	❍
I figured things out logically	❍	❍	❍	❍	❍
I approached the task analytically	❍	❍	❍	❍	❍
I was very focused on the steps involved in doing the task	❍	❍	❍	❍	❍
I applied precise rules to deduce the answers	❍	❍	❍	❍	❍
I was very focused on what I was doing to arrive at the answers	❍	❍	❍	❍	❍
I was very aware of my thinking process	❍	❍	❍	❍	❍
I arrived at my answers by carefully assessing the information	❍	❍	❍	❍	❍

I used clear rules	❍	❍	❍	❍	❍

Please answer the following questions in regards to how you LISTENED TO THE SONG.

	Definitely false	Mostly false	Undecided	Mostly true	Definitely true
I used my gut feelings	❍	❍	❍	❍	❍
I went by what felt good to me	❍	❍	❍	❍	❍
I trusted my hunches	❍	❍	❍	❍	❍
I relied on my sense of intuition	❍	❍	❍	❍	❍
I relied on my first impressions	❍	❍	❍	❍	❍
I used my instincts	❍	❍	❍	❍	❍
I used my heart as a guide for my actions	❍	❍	❍	❍	❍
I had flashes of insight	❍	❍	❍	❍	❍
Ideas just popped into my head	❍	❍	❍	❍	❍
I used free-association, where one idea leads to the next	❍	❍	❍	❍	❍

Did you like the clip of music?

- ❍ Not At All
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ Very Much So

Did you have the volume...

	1	2	3	4	5	6	7
Very Low:Very High	❍	❍	❍	❍	❍	❍	❍

PANAS Positive and Negative Affect Schedule (Watson et al. 1988)

Please answer this question based on how you feel RIGHT NOW

	Not At All	A Little	Moderately	Quite A BIt	Extremely
Interested	❍	❍	❍	❍	❍
Distressed	❍	❍	❍	❍	❍
Excited	❍	❍	❍	❍	❍
Upset	❍	❍	❍	❍	❍
Strong	❍	❍	❍	❍	❍
Guilty	❍	❍	❍	❍	❍
Scared	❍	❍	❍	❍	❍
Hostile	❍	❍	❍	❍	❍
Enthusiastic	❍	❍	❍	❍	❍
Proud	❍	❍	❍	❍	❍
Irritable	❍	❍	❍	❍	❍
Alert	❍	❍	❍	❍	❍
Ashamed	❍	❍	❍	❍	❍
Inspired	❍	❍	❍	❍	❍
Nervous	❍	❍	❍	❍	❍
Determined	❍	❍	❍	❍	❍
Attentive	❍	❍	❍	❍	❍

Jittery	❍	❍	❍	❍	❍
Active	❍	❍	❍	❍	❍
Afraid	❍	❍	❍	❍	❍

Do you like electronic dance music?

❍ Not At All
❍
❍
❍
❍
❍
❍ Very Much So
❍

Had you heard the song in the clip before?

❍ No
❍ Yes

To what degree do you feel you learnt something new from listening to that music clip?

❍ Not At All
❍
❍
❍
❍
❍
❍ Very Much So

How old are you?

_____ years

Are you....

❍ Male
❍ Female

Is English your native language?

- ❍ Yes
- ❍ No

Debriefing Statement

In this study we were concerned with the psychological state of flow- being completely engaged or immersed into an activity. We had you listen to a clip of music because it is common to experience flow when listening to music. However, if you do not like the type of music it is unlikely for you to experience flow. On the next page, you will be given a chance to request a summary of the results when they are ready (in approximately 6 months). Email addresses will be deleted once the results are sent and are not used for any other purpose. If you do not with to have a copy of the results summary, leave it blank.

Appendix B- Study 2 Materials

INFORMED CONSENT FORM
Researcher: Ray Lavoie, PhD Student in Marketing

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. Please take the time to read this carefully and to understand any accompanying information.

This survey will take approximately 5 minutes and will consist of several parts which are explained below. After reading the description, please select either "Yes" or "No" corresponding to whether or not you wish to participate in the study.

This study is trying to determine how and why people experience reading differently. As such, we will ask you to read a passage from a book and ask you information about your experience and then some information about yourself.

All responses to the questionnaires will be kept on a USB in a locked office accessible only to the primary researchers. There is no identifying information asked for on any of the questionnaires. You are free to terminate your participation at any time.

These research projects have been approved by the Joint Faculty Research Ethics Board of the University of Manitoba. If you have any concerns or complaints about any of these projects, you may contact the above-named persons.

Your response on this form indicates that you have understood to your satisfaction the information regarding participation in the research projects and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from any of the studies at any time, and/or refrain from answering any questions

you prefer to omit, without prejudice. Your continued participation should be as informed as your initial consent. The data from the study will be used only for academic research. No part of the data will be sold or used for any commercial purpose.

Fluency Manipulation (real text size)

....when I finally reached the other side of the trees and peered around the corner, the image of the landscape struck me and stopped me in my tracks. I couldn't help but stand and stare. To the right there was a doorway, built into a grassy hill about 6 feet high. The hill was covered in long grass, with vines growing out over the front of the door. It seemed like no one had been through the door for hundreds of years.

There were small traces of steps leading up to the door. The grass had grown over them, slowly covering them up over time. There were flowers, bright red and yellow, scattered along each side of the stairs, providing a seemingly warm welcome to the doorway, inviting me up. The grass was perfect, with dark shades of green mixed throughout the lighter blades.

On top of the hill there was a massive tree, with branches winding like snakes, flowing around each other in every direction. The tree was like none I had seen before. The leaves were bright green and thick. They were gathered at the top of the tree to form a thick barrier, not letting any light get through, it was like a canopy protecting the entire hill. The tree was majestic in the way it formed patterns and designs with its winding branches.

As I gazed upon the tree, I followed its thick roots, which cascaded down the hillside. As my eyes reached the edge of the hill, I couldn't help but look off into the distance, revealing a breathtaking scene. I could see a great valley, with steep

mountains protecting it on either side. The valley went on for miles. It was filled with deep jungle brush and trees like that on top of the hill in front of me.

A river wound through the center of the valley all the way to the other end. I followed the river with my eyes to the far end of the valley, where there was an enormous waterfall, with water rushing down hundreds of feet to the jungle. You could see the mist coming off of the water.

I could feel a gentle, warm breeze flowing in from the valley, over the hill. There was not a cloud in the sky and the air was fresh, as if a rainstorm had just passed through. It was a breath-taking scene before me as I stood over the vast valley and jungle below me. I stood there taking in the scenes and the serenity they provided.

Relaxing in my blissful serenity, I could hear faint animal noises coming from the valley. It sounded like monkeys but I wasn't quite sure. It enticed me to go down and make my way to the waterfall to see what was happening in this great valley.

But first, I had to check out the old doorway underneath the majestic tree. As I started walking towards it I was sure to be careful with my steps....

Disfluency Manipulation (real text size)

....when I finally reached the other side of the trees and peered around the corner, the image of the landscape struck me and stopped me in my tracks. I couldn't help but stand and stare. To the right there was a doorway, built into a grassy hill about 6

feet high. The hill was covered in long grass, with vines growing out over the front of the door. It seemed like no one had been through the door for hundreds of years.

There were small traces of steps leading up to the door. The grass had grown over them, slowly covering them up over time. There were flowers, bright red and yellow, scattered along each side of the stairs, providing a seemingly warm welcome to the doorway, inviting me up. The grass was perfect, with dark shades of green mixed throughout the lighter blades.

On top of the hill there was a massive tree, with branches winding like snakes, flowing around each other in every direction. The tree was like none I had seen before. The leaves were bright green and thick. They were gathered at the top of the tree to form a thick barrier, not letting any light get through, it was like a canopy protecting the entire hill. The tree was majestic in the way it formed patterns and designs with its winding branches.

As I gazed upon the tree, I followed its thick roots, which cascaded down the hillside. As my eyes reached the edge of the hill, I couldn't help but look off into the distance, revealing a breathtaking scene. I could see a great valley, with steep mountains protecting it on either side. The valley went on for miles. It was filled with deep jungle brush and trees like that on top of the hill in front of me.

A river wound through the center of the valley all the way to the other end. I followed the river with my eyes to the far end of the valley, where there was an enormous waterfall, with water rushing down hundreds of feet to the jungle. You could see the mist coming off of the water.

I could feel a gentle, warm breeze flowing in from the valley, over the hill. There was not a cloud in the sky and the air was fresh, as if a rainstorm had just passed through. It was a breath-taking scene before me as I stood over the vast valley and jungle below me. I stood there taking in the scenes and the serenity they provided.

Relaxing in my blissful serenity, I could hear faint animal noises coming from the valley. It sounded like monkeys but I wasn't quite sure. It enticed me to go down and make my way to the waterfall to see what was happening in this great valley.

But first, I had to check out the old doorway underneath the majestic tree. As I started walking towards it I was sure to be careful with my steps....

Flow Short Scale (Engeser and Rheinberg 2008)

Absorption Subscale

Please answer the following questions based on your experience reading the story…

	Not At All			Partly			Very Much
I was totally absorbed into the story	❍	❍	❍	❍	❍	❍	❍
I lost track of time	❍	❍	❍	❍	❍	❍	❍
I was completely lost in thoughts about the story	❍	❍	❍	❍	❍	❍	❍
I felt just the right amount of challenge in reading the story	❍	❍	❍	❍	❍	❍	❍

Fluency Subscale

Please answer the following questions based on your experience reading the story…

	Not At All			Partly			Very Much
I had no difficulty concentrating	❍	❍	❍	❍	❍	❍	❍
My thoughts ran fluidly and smoothly	❍	❍	❍	❍	❍	❍	❍
My thoughts seemed to happen naturally and on their own	❍	❍	❍	❍	❍	❍	❍
I knew what I was doing each step of the way	❍	❍	❍	❍	❍	❍	❍
My mind was completely clear	❍	❍	❍	❍	❍	❍	❍
I felt that everything was under control	❍	❍	❍	❍	❍	❍	❍

How likely would you be to read the book that this passage was from?

❍ Not At All
❍
❍
❍
❍
❍
❍ Very Likely

How likely would you be to purchase a copy of the book that this passage was from?

- ❍ Not At All
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ Very Likely

My competence in the area of reading is..

- ❍ Low
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ High

My reading ability is...

- ❍ Low
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ High

Flow Questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988)

Please read the following quotes. The questions that follow are based on them. 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 else. 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. When I start, I really do shut out the world. I am really quite oblivious to my surroundings after I really get going. I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the world. Once I stop I can let it back in again. I am so involved in what I am doing. I don't see myself as separate from what I am doing.

Did you feel the experience that the quotes explained while reading the story?

- ❍ Yes
- ❍ No

Positive Items from the PANAS scale (Watson et al. 1988)

Please answer this question based on how you feel RIGHT NOW

	Not At All	A Little	Moderately	Quite A BIt	Extremely
Interested	❍	❍	❍	❍	❍
Excited	❍	❍	❍	❍	❍
Strong	❍	❍	❍	❍	❍
Enthusiastic	❍	❍	❍	❍	❍
Proud	❍	❍	❍	❍	❍
Alert	❍	❍	❍	❍	❍
Inspired	❍	❍	❍	❍	❍
Determined	❍	❍	❍	❍	❍
Attentive	❍	❍	❍	❍	❍
Active	❍	❍	❍	❍	❍

How old are you?

_____ years

Are you....

- ❍ Male
- ❍ Female
- ❍ Other

Is English your native language?

- ❍ Yes
- ❍ No

How many years have you spoke english for?

_____ years

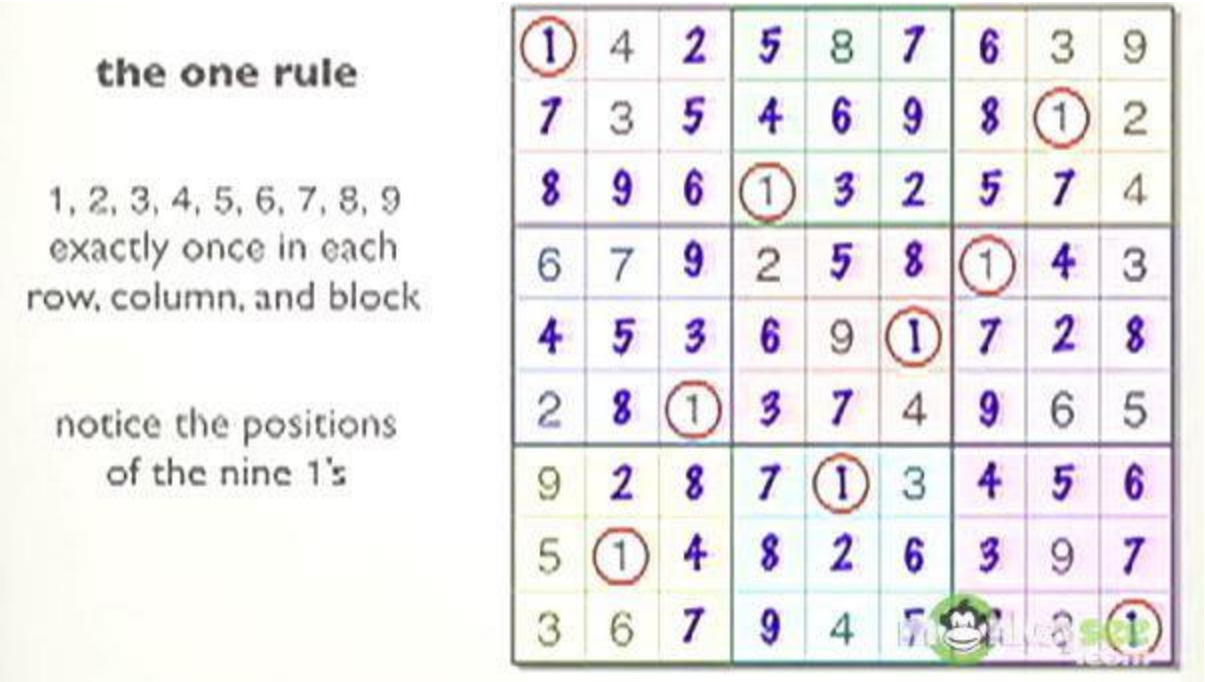
Debriefing Passage

The information from this research is being used for research related to entering the psychological state of flow. Flow is complete mental absorption and attention to an activity where one seems to forget about time and is lost in what they are doing. Flow is typically a positive and enjoyable state of mind. If you had difficulty in any of the tasks that is natural as some of the tasks were specifically chosen and designed to be new to you as level of prior knowledge influences the flow experience and is a variable of interest to us.
We had you read a passage from a book because that best allows for you to enter flow. We measured your enjoyment of the experience and how involved you were with the task to demonstrate whether you entered flow or not.
We are concerned with how long it takes for people to enter flow. We expect that people will take approximately one minute to sufficiently enter flow.

Appendix C- Study 3 Materials

This study is trying to determine how different people play games. As such, we will ask you to solve a Sudoku puzzle and to provide some information about yourself. The study will take approximately 10 minutes. There is minimal risk to taking this survey outside of what you would experience in everyday life.

In a sudoku, the goal is to fill up all of the empty squares with the numbers 1-9. There is only 1 solution to each Sudoku. There is only one rule. There must be one and only one of each number (1-9) in every row, column and box. There are nine boxes as clarified by the darker outlines, they each have 9 squares in them. See the completed sudoku below and notice the pattern for each number.



Please ask the person running the lab for a sudoku puzzle. Fill in the code on the top right of the page with the sudoku on it in the box below before starting. Once you have entered the code below please go to the next page and then start the sudoku.

Flow State Scale (Engeser and Rheinberg 2008)

Please answer the following questions based on your experience while working on the sudoku puzzle...

	Not At All			Partly			Very Much
I knew what I was doing each step of the way	❍	❍	❍	❍	❍	❍	❍
My thoughts ran fluidly and smoothly	❍	❍	❍	❍	❍	❍	❍
My thoughts seemed to	❍	❍	❍	❍	❍	❍	❍

happen naturally and on their own							
I felt that I had everything under control	❍	❍	❍	❍	❍	❍	❍
I felt just the right amount of challenge from the puzzle	❍	❍	❍	❍	❍	❍	❍
I lost track of time	❍	❍	❍	❍	❍	❍	❍
I had no difficulty concentrating	❍	❍	❍	❍	❍	❍	❍
I was totally absorbed into the experience	❍	❍	❍	❍	❍	❍	❍
My mind was completely clear	❍	❍	❍	❍	❍	❍	❍
I was completely lost in thought	❍	❍	❍	❍	❍	❍	❍

Flow Questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988)

Please read the following quotes. The questions that follow are based on them.

“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 else. 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. When I start, I really do shut out the world. I am really quite oblivious to my surroundings after I really get going. I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the world. Once I stop I can let it back in again. I am so involved in what I am doing. I don't see myself as separate from what I am doing."

Did you feel the experience that the quotes explained at ANY POINT while listening to the sound clip?

- ❍ Yes
- ❍ No

Please generate as many creative ideas that you can for a new kind of mattress in the space below, with each idea separated by a comma.

_____

My competence in regards to completing puzzles is

- ❍ Low
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ High

To what degree do you feel you learnt something new from working on that sudoku?

- ❍ Low
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ High

PANAS Positive and Negative Affect Schedule (Watson et al. 1988)

Please answer this question based on how you feel RIGHT NOW

	Not At All	A Little	Moderately	Quite A BIt	Extremely
Interested	❍	❍	❍	❍	❍
Distressed	❍	❍	❍	❍	❍
Excited	❍	❍	❍	❍	❍
Upset	❍	❍	❍	❍	❍
Strong	❍	❍	❍	❍	❍
Guilty	❍	❍	❍	❍	❍
Scared	❍	❍	❍	❍	❍
Hostile	❍	❍	❍	❍	❍
Enthusiastic	❍	❍	❍	❍	❍
Proud	❍	❍	❍	❍	❍
Irritable	❍	❍	❍	❍	❍
Alert	❍	❍	❍	❍	❍
Ashamed	❍	❍	❍	❍	❍
Inspired	❍	❍	❍	❍	❍
Nervous	❍	❍	❍	❍	❍
Determined	❍	❍	❍	❍	❍
Attentive	❍	❍	❍	❍	❍
Jittery	❍	❍	❍	❍	❍
Active	❍	❍	❍	❍	❍
Afraid	❍	❍	❍	❍	❍

How familiar were you with sudoku puzzles before you started this study?

❍ Not familiar at all
❍
❍
❍
❍
❍
❍ Very Familiar

How old are you?

——————— years

Are you....

- ❍ Male
- ❍ Female

Is English your native language?

- ❍ Yes
- ❍ No

Debriefing Passage

In this study we were concerned with the psychological state of flow- being completely engaged or immersed into an activity. We had you work on a Sudoku puzzle because we expect to find that you would experience flow while engaged with it.

Some of you would have worked on a hard Sudoku and some on an easy one. We expected to find that those who worked on the easy Sudoku would experience flow and as a result be less creative on subsequent tasks than those who worked on the hard puzzle.

If you want to see the results of this study please email [redacted]. Results will be available in approximately one years time.

Sudoku Example- Easy Sudoku

A90

Please work on this until the timer on screen is up. When the timer on your screen runs out please put up your hand and return this sheet to the person running the lab.

				4			7	8
		2	7	8		1		4
4		8			1	6		
7				6	2	9		1
		5	1		4		8	
8	2	1	9	7		4	3	
1			3		9			7
2					7	3		
	4	7	6	5	8	2	1	9

Sudoku Example- Hard Sudoku

B90

Please work on this until the timer on screen is up. When the timer on your screen runs out please put up your hand and return this sheet to the person running the lab.

		1				5		7
					4			9
4		8		9		2		3
	1			6			5	
	3	2	5		8			
			3					4
			1		6			
	2							
6					5		8	

Appendix D- Study 1 Replication Study and Measures

In this I seek to replicate the findings of Study 1 by manipulating involvement. That is, I first seek to demonstrate that the flow process is fluency leading to absorption to perceptions of flow. Second I seek to demonstrate that involvement is an antecedent to the flow process but is not a mediator. Participants (N = 66 undergraduate students, M_{age} = 19.85, 58.5% male) were asked to listen to the same music clip as Study 1. The study followed a 2(involvement: high vs. low) between-participants design such that participants either received information about how the song was made (high involvement) or received information about how chocolate was made (low involvement).

Manipulation Check. I assessed involvement in the same way as Study 1 (7 items, *a* = .932, Zaichkowsky 1985).

Dependent Measures. I assessed fluency and absorption the same way as in Study 1 (fluency, 6 items, *a* = .805; absorption, 4 items, *a* = .839, Engeser and Rheinberg 2008). As in Study 1 I used the flow questionnaire to determine whether people thought they were in flow or not (Csikszentmihalyi and Csikszentmihalyi 1988).

Results

Manipulation Check. An independent sample t-test on involvement was significant such that those who received information about the type of music were more involved before listening to the song (M= 3.98) than those who received information about chocolate (M= 3.29, t(64)= -2.35, *p*= .022).

Dependent measures. An independent sample t-test on fluency was significant such that those high in involvement had a more fluent experience listening to the song (M = 4.44) than low

in involvement (M = 3.81, t(64)= -2.12, p = .038). The results of the same analysis on absorption were not significant as those high in involvement did not differ with regards to absorption (M= 3.21) from those low in involvement (M = 2.79, t(64)= -1.20, p = .235). It is also important to note that those high in involvement did not differ in their likelihood to experience flow overall (48.6%) from those low in involvement using the flow questionnaire (38.7%, X^2 (66)= .649, p= .420).

Mediation. I ran several serial mediation models to test our hypotheses. First, I sought to demonstrate that involvement facilitates the flow process of fluency to absorption. To test this, I ran Model 4 of the SPSS PROCESS macro (Hayes 2012) with the manipulated involvement conditions as the independent variable. The model through fluency was significant [*B*= .3592, S.E.= .1829, 95% C.I. .0619, .8018]. Importantly, the model through absorption was not significant [*B*= .1731, S.E.= .1490, 95% C.I. -.0741, .5170]. These models replicate the findings of Study 1 by manipulating involvement. I also ran mediation models to replicate the findings of Study 1 related to the full flow process with fluency and absorption giving rise to the overall evaluation of whether one experienced flow. The analysis replicated the findings of study 1 such that the model of fluency leading to absorption to flow was significant [*B*= .4003, S.E.= .1798, 95% C.I. .1293, .8243] but the model of absorption leading to fluency to flow was not significant [*B*= .0023, S.E.= .1243, 95% C.I. -.2161, .2804].

I also ran mediation models with involvement mediating the relationship between fluency, absorption and the overall flow experience. However, neither the fluency-involvement-flow model [*B*= .0733, S.E.= .0606, 95% C.I. -.0048, .2479] nor the absorption-involvement-flow model were significant [*B*= .0192, S.E.= .0876, 95% C.I. -.1456, .2006].

Study 1 Replication Study Measures

INFORMED CONSENT FORM
Researcher: Ray Lavoie, PhD Student in Marketing

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. Please take the time to read this carefully and to understand any accompanying information.

This survey will take approximately 10 minutes and will consist of several parts which are explained below. After reading the description, please select either “Yes” or “No” corresponding to whether or not you wish to participate in the study.

This study is trying to determine how different people listen to music. As such, we will ask you to listen to a 3 minute clip of music and to provide some information about yourself.

All responses to the questionnaires will be kept in a locked office accessible only to the primary researchers. There is no identifying information asked for on any of the questionnaires. You are free to terminate your participation at any time.

These research projects have been approved by the Joint Faculty Research Ethics Board of the University of Manitoba. If you have any concerns or complaints about any of these projects, you may contact the above-named persons.

Your response on this form indicates that you have understood to your satisfaction the information regarding participation in the research projects and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from any of the studies at any time, and/or refrain from answering any questions you prefer to omit, without prejudice. Your continued participation should be as informed as your initial consent. The data from the study will be used only for academic research. No part of the data will be sold or used for any commercial purpose.

In this study we are interested in people's sensory ability, including how they listen to sounds and how they experience them. You will be randomly assigned to hear 1 of 4 different clips. We will ask you about your experience listening to the sounds afterwards.

This study requires the use of headphones to listen to the music. Please put on the headphones to your right and listen to the following clip to adjust your volume to a level that is right for you. The play button

is on the left side of the grey bar below. Please move to the next page once your volume is adjusted, do not wait until the end of the clip, this is for volume adjustment only.

Electronic Music Information (High Involvement) Condition

Please read the passage below as a reading comprehension task before you move on to the song.

Progressive house tunes often feature a long build-up section followed by a breakdown and then a climax. Progressive songs slowly increase the amount of different sounds layered onto each other like slowly adding pieces to a puzzle. You can hear different sounds being introduced one at a time, eventually combining into the larger pattern. Electronic music is produced from a wide variety of sound resources—from sounds picked up by microphones to those produced by electronic oscillators (generating basic acoustical wave forms such as sine waves, square waves, and sawtooth waves), complex installations, and microprocessors—that are recorded on tape and then edited into a permanent form. The progressive house genre features elements of Italo house riffs. The roots of progressive house can be traced back to the early 1990s rave and club scenes in the United Kingdom, Europe, Australia and Northern America. A combination of US house, UK house, Italian house, German house, and techno largely influenced one another during this era. The term was used mainly as a marketing label to differentiate new rave house from traditional American house.

Chocolate Information (Low Involvement) Condition

You have been assigned to listen to progressive house music. Please read the passage below as a reading comprehension task before you move on to the song. Chocolate is a typically sweet food preparation of Theobroma cacao seeds, roasted and ground, often flavored, as with vanilla. It is made in the form of a liquid, paste or in a block or used as a flavoring ingredient in other sweet foods. Cacao has been cultivated by many cultures for at least three millennia in Mesoamerica. The earliest evidence of use traces to Guatemala with evidence of chocolate beverages dating back to 1900 BC. In fact, the majority of Mesoamerican people made chocolate beverages, including the Aztecs who made it into a beverage known as Nahuatl meaning "bitter water". The seeds of the cacao tree have an intense bitter taste and must be fermented to develop the flavor. After fermentation, the beans are dried, cleaned, and roasted. The shell is removed to produce cacao nibs, which are then ground to cocoa mass pure chocolate in rough form. Much of the chocolate consumed today is in the form of a combination of cocoa solids, cocoa butter or other fat, and sugar. Milk chocolate is a sweet chocolate that additionally contains milk powder or condensed milk.

Before you move onto the progressive house song please answer the following questions related to how you feel right now. The song will be on the next page.

Involvement Scale (Zaichkowsky 1985)

To you, to what degree is the progressive house song you are about to hear...

	1	2	3	4	5	6	7
Unimportant:Important	❍	❍	❍	❍	❍	❍	❍
Of No Concern:Of Concern	❍	❍	❍	❍	❍	❍	❍
Irrelevant:Relevant	❍	❍	❍	❍	❍	❍	❍
Means Nothing To Me:Means Alot To me	❍	❍	❍	❍	❍	❍	❍
Useless:Useful	❍	❍	❍	❍	❍	❍	❍
Worthless:Valuable	❍	❍	❍	❍	❍	❍	❍
Doesn't Matter:Matters To Me	❍	❍	❍	❍	❍	❍	❍

Curiosity items from the state-trait personality inventory (Speilberger et al. 1979)

Please identify how you feel right now before listening to the song

	Not At All	Somewhat	Moderately	Very Much
I feel curious	❍	❍	❍	❍
I feel bored	❍	❍	❍	❍
I feel disinterested	❍	❍	❍	❍
I feel eager	❍	❍	❍	❍
I feel like exploring my environment	❍	❍	❍	❍
I feel inquisitive	❍	❍	❍	❍
I feel interested	❍	❍	❍	❍
I am in a questioning mood	❍	❍	❍	❍
I feel stimulated	❍	❍	❍	❍
I feel mentally active	❍	❍	❍	❍

Flow State Scale (Engeser and Rheinberg 2008)

Please answer the following questions based on your experience while listening to that clip of music...

	Not At All			Partly			Very Much
My thoughts ran fluidly and smoothly	❍	❍	❍	❍	❍	❍	❍
I lost track of time	❍	❍	❍	❍	❍	❍	❍
I had no difficulty concentrating	❍	❍	❍	❍	❍	❍	❍
I was totally absorbed into the experience	❍	❍	❍	❍	❍	❍	❍
My mind was completely clear	❍	❍	❍	❍	❍	❍	❍
My thoughts seemed to happen naturally and on their own	❍	❍	❍	❍	❍	❍	❍
I knew what I was doing each step of the way	❍	❍	❍	❍	❍	❍	❍
I felt that I had everything under control	❍	❍	❍	❍	❍	❍	❍
I was completely lost in thought	❍	❍	❍	❍	❍	❍	❍
I felt just the right amount of challenge in understanding the clip	❍	❍	❍	❍	❍	❍	❍

Compared to other activities, listening to that music clip was

- ❍ Very Easy
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ Difficult

I think that my competence in the area of listening to the music clip is

- ❍ Low
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ High

For me personally, the demands of listening to that clip of music were

- ❍ Too Low
- ❍
- ❍
- ❍ Just Right
- ❍
- ❍
- ❍ Too High

Flow Questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988)

Please read the following quotes. The questions that follow are based on them.

“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 else. 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. When I start, I really do shut out the world. I am really quite oblivious to my surroundings after I really get going. I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the world. Once I stop I can let it back in again.”

“I am so involved in what I am doing. I don’t see myself as separate from what I am doing.”

Did you feel the experience that the quotes explained at ANY POINT while listening to the sound clip?

- ❍ Yes
- ❍ No

To what degree did you experience what those quotes explained?

- ❍ Not At All
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ Very Much

How long did you experience what those quotes explained?

- ❍ A few seconds
- ❍
- ❍
- ❍
- ❍
- ❍ The whole time

If you can, please describe the emotional experience (timing) that you felt WHEN LISTENING TO THE CLIP (e.g. at first I felt...then I felt...). If you can't describe specific emotions stick to general states like I felt negative and then positive.

_____

Did you like the clip of music?

- ❍ Not At All
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ Very Much So

Did you have the volume...

	1	2	3	4	5	6	7
Very Low:Very High	❍	❍	❍	❍	❍	❍	❍

Positive and Negative Affect Schedule (PANAS) (Webster et al. 1988)

Please answer this question based on how you feel RIGHT NOW

	Not At All	A Little	Moderately	Quite A BIt	Extremely
Interested	❍	❍	❍	❍	❍
Distressed	❍	❍	❍	❍	❍
Excited	❍	❍	❍	❍	❍
Upset	❍	❍	❍	❍	❍
Strong	❍	❍	❍	❍	❍
Guilty	❍	❍	❍	❍	❍
Scared	❍	❍	❍	❍	❍
Hostile	❍	❍	❍	❍	❍
Enthusiastic	❍	❍	❍	❍	❍
Proud	❍	❍	❍	❍	❍
Irritable	❍	❍	❍	❍	❍
Alert	❍	❍	❍	❍	❍
Ashamed	❍	❍	❍	❍	❍
Inspired	❍	❍	❍	❍	❍
Nervous	❍	❍	❍	❍	❍
Determined	❍	❍	❍	❍	❍
Attentive	❍	❍	❍	❍	❍
Jittery	❍	❍	❍	❍	❍
Active	❍	❍	❍	❍	❍
Afraid	❍	❍	❍	❍	❍

Do you like electronic dance music?

❍ Not At All
❍
❍
❍
❍
❍
❍ Very Much So

How much of the clip of music did you listen to?

- ❍ None
- ❍ Some
- ❍ Most
- ❍ All

Had you heard the song in the clip before?

- ❍ No
- ❍ Yes

To what degree do you feel you learnt something new from listening to that music clip?

- ❍ Not At All
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ Very Much So

Please generate as many creative ideas that you can for a new kind of mattress in the space below, with each idea separated by a comma.

_____

How old are you?

_____ years

Are you....

- ❍ Male
- ❍ Female

Is English your native language?

- ❍ Yes
- ❍ No

Debriefing Statement

In this study we were concerned with the psychological state of flow- being completely engaged or immersed into an activity. We had you listen to a clip of music because it is common to experience flow when listening to music. However, if you do not like the type of music it is unlikely for you to experience flow. We tried to see if information about the type of music would help those who do not like the genre to experience flow. Some of you would have received information about chocolate as a control and some received information about progressive house music.

If you want to see the results of this study please email [redacted]. Results will be available in approximately one years time.

Appendix E- Essay 2 Study 4 Measures

INFORMED CONSENT FORM

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. After reading this please select either "Yes" or "No" corresponding to whether or not you wish to participate.

Primary Researchers: Ray Lavoie, [redacted], [redacted], Kelley Main, [redacted], [redacted]

In this study you will be asked to use a rowing machine at a comfortable pace for approximately two minutes. When you are finished you will be asked to fill out a short questionnaire regarding the experience and questions about yourself. The study should take approximately 8 minutes in total.

All data from this study will be kept on a password-protected USB accessible only to the primary researchers. The data will be kept to the research team (i.e the primary researcher and research assistants coding the data) and used solely for the purpose of the research hypothesis to ensure confidentiality. There is no identifying information asked in the questionnaire to protect your individual rights. We will email you a debriefing in regards to what exactly we are studying. There is minimal risk to participating in this study outside of what you would experience in everyday life. For your participation in this research, you will receive $5. You are free to terminate your participation at any time.

This research has been approved by the Psychology and Sociology Research Ethics Board of the University of Manitoba. If you have any concerns or complaints you may contact Ray Lavoie or the Human Ethics Secretariat at [redacted], or [redacted]. The University of Manitoba may access the records of this research to ensure that the research is being conducted in a safe and proper way.

Your response on this form indicates that you have understood to your satisfaction the information regarding participation in the research projects and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. If you have any questions or want to leave the study please inform the primary researcher who will be present while you participate and they will let you go. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. The data from the study will be used only for academic research. No part of the data will be sold or used for any commercial purpose.

If you wish to receive a copy of this INFORMED CONSENT FORM to keep for your own records or the results of this research, please inform the researcher conducting your experimental session. A copy of the research findings will be available by email in approximately one years time from Ray Lavoie. Data will be kept indefinitely as journals now have the right to request data in the review process and afterwards to protect academic integrity. If you request to be removed from the study you may request that any data related to your participation be destroyed. Notify the primary researcher if this is the case.

Rowing Study Questionnaire

Date_____

Flow State Scale (Engeser and Rheinberg 2008)

Please answer the following questions regarding your experience on the rower…

	Not At All			Partly			Very Much
I was totally absorbed into the rowing task	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I lost track of time	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I was completely lost in thought	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I felt just the right amount of challenge while rowing	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I had no difficulty concentrating on the rowing	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I knew what I was doing each step of the way	**1**	**2**	**3**	**4**	**5**	**6**	**7**
My thoughts ran fluidly and smoothly	**1**	**2**	**3**	**4**	**5**	**6**	**7**
My mind was completely clear	**1**	**2**	**3**	**4**	**5**	**6**	**7**
My thoughts seemed to happen naturally and on their own	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I felt that I had everything under control	**1**	**2**	**3**	**4**	**5**	**6**	**7**

1. **How fluent was the use of the rower?**

Not At All Very Fluent

1 2 3 4 5 6 7

2. **How effortless was it to row?**

Not At All Very Effortless

1 2 3 4 5 6 7

3. **How smooth was it when you rowed?**

Not At All Very Smooth

1 2 3 4 5 6 7

4. **How difficult was it to row?**

Not At All Very Difficult

1 2 3 4 5 6 7

Flow Questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988)

Please read the following quotes:

"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 else. 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. When I start, I really do shut out the world. I am really quite oblivious to my surroundings after I really get going. I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the world. Once I stop I can let it back in again."

"I am so involved in what I am doing. I don't see myself as separate from what I am doing."

Did you feel the experience that the quotes explained while rowing?

Yes_____ No_____

Please rate the rowing machine…

Bad Good

1 2 3 4 5 6 7

Negative Positive

1 2 3 4 5 6 7

Unfavorable Favorable

1 2 3 4 5 6 7

How likely would you be to use a rowing machine like this again?

Not At All Very Likely

1 2 3 4 5 6 7

How likely would you be to tell someone about this rowing machine?

Not At All Very Likely

1 2 3 4 5 6 **7**

How likely would you be to post a photo/video on social media using this rower?

Not At All Very Likely

1 2 3 4 5 6 7

Was the 'salesperson' standing beside you the entire time that you rowed?

Yes/ No

If yes, how they make you feel by standing there?

In regards to you trying to row, was the salesperson distracting?

Not at all Very much so

1 2 3 4 5 6 7

In regards to you trying to row, was the salesperson disrupting?

Not at all Very much so

1 2 3 4 5 6 7

Did your mind wander at all when rowing?

Not at all Very much so

1 2 3 4 5 6 7

The rowing machine can be set to different levels of difficulty. How difficult do you think it was set for your trial today?

Easiest Possible Hardest Possible

1 2 3 4 5 6 7

How old are you?

_____ years old

What is your gender? (Please circle)

Male/ Female/ Other

Have you ever used a rowing machine before? (Please circle)

Yes / No

How often do you exercise?

Debriefing Passage

In this study we were concerned with fostering a state of flow, which is the psychological state of being in the zone. We have showed that experiencing flow while trialing products has lead to the increased desire to purchase the product.

In this study we were trying to "shut off" flow. We have demonstrated that experiencing 'fluency' in a task facilitates becoming absorbed into the task and ultimately experiencing flow. We were testing to see whether we could shut off the relationship between fluency and flow by having a salesperson either stand there and watch you try the product or leave you alone.

The idea is that the task is still fluent (rowing was relatively easy) but we wanted to see if you would be more or less likely to become absorbed in the task if someone was watching you. We expect that it could go both ways. Having someone there could distract you from the task and limit becoming absorbed but having them there could also motivate you to work harder on the task and become absorbed.

Appendix F- Essay 2 Study 5 Materials

INFORMED CONSENT FORM

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

After reading the description please select either “Yes” or “No” corresponding to whether or not you wish to participate in the study

Study Name: Video Game Testing

Primary Researchers: Ray Lavoie, [redacted], [redacted]

In this study you will be asked to play a mobile game. The study should take approximately 20 mintues. When you are finished you will be asked to fill out a short questionnaire regarding the experience and questions about yourself.

All data from this study will be kept in a locked office accessible only to the primary researchers. There is no identifying information asked in the questionnaire to protect your individual rights. At the end of the study we will debrief you in regards to what exactly we are studying. There is minimal risk to participating in this study outside of what you would experience in everyday life. For a summary of the results, please contact the corresponding researcher. For your participation in this research, you will receive $10.

These research projects have been approved by the Psychology and Sociology Research Ethics Board of the University of Manitoba. If you have any concerns or complaints about any of these projects, you may contact the above-named persons (e.g. Ray Lavoie) or the Human Ethics Secretariat at [redacted], or e-mail [redacted]. The University of Manitoba may access the records of this research to ensure that the research is being conducted in a safe and proper way.

Your response on this form indicates that you have understood to your satisfaction the information regarding participation in the research projects and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and/or refrain from answering any questions you prefer to omit, without prejudice or consequence. If you have any questions or want to leave the study please inform the primary researcher who will be present while you participate. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. The data from the study will be used only for academic research. No part of the data will be sold or used for any commercial purpose.

If you wish to receive a copy of this INFORMED CONSENT FORM to keep for your own records or the

results of this research, please inform the researcher conducting your experimental session. A copy of the research findings will be available by email in approximately one years time from Ray Lavoie. Data will be kept indefinitely as journals now have the right to request data in the review process and afterwards to protect academic integrity. If you request to be removed from the study you may request that any data related to your participation be destroyed. Notify the primary researcher if this is the case and they will destroy it.

Clandestine Anomaly Game Pictures

Augmented Reality Manipulation

What is augmented reality (AR)?

The game you are about to play features augmented reality (AR) technology once you make your way past the first level. Augmented reality is a new technology which has just begun entering the market in different product variations and is changing the way we communicate and interact with our world.

Augmented reality is the integration of digital information with the user's environment in real time. It overlays computer generated images into the real world. Basically, it takes an existing environment (a live real-world scenario) and blends computer generated information into it. One of the first commercial applications of augmented reality is the yellow *first down* line in televised football games. Through the camera view you can see graphic content (the yellow line) over the real world content on the football field but it is not really there.

In the application that you will be using today, augmented reality is made possible by the device's camera and GPS function. The GPS function tells the game where to put the content and the phone's camera makes it visible when it is facing in the right direction. You can only see the content when you look through the camera of the iPhone or iPad that you will be using. As such, it is not full virtual reality but rather only seen through your device.

Today you will be able to play parts of the game in augmented reality as the game will be projected through your phone's camera into your real world. You will be able to see everything that is going on in the game, in your actual surroundings. Moreover, you will be able to interact with the game in augmented reality.

Gym Information Condition

Active Living Center

The new active living center in the Frank Kennedy building at the University of Manitoba has over 100,000 square feet of space. The building features an open-concept, including floor-to-ceiling windows which allow the sun to shine down over you during your workout- much the opposite of its predecessor the 'gritty grotto.'

The 100,000 square foot facility offers over 1,000 pieces of free weights and accessories, 200 meters of elevated running track, 160 pieces of cardio equipment, 64 pieces of resistance equipment, 49 pieces of strength equipment and a 40 foot high climbing wall. This includes the third-largest collection of Precor networked cardio units in the world.

The collection of equipment and the vast amount of space combine to provide an ideal workout experience no matter what you have in mind. Each year, over 7,800 students and 1000 staff and community members use the Faculty of Kinesiology and Recreation Management's sport and recreation facilities. Join that group and help make those numbers grow- Active living for life!

Essay 2 Study 2 Full Questionnaire

Video Game Trials (March)

Date_____ Session Start Time_____

Involvement Scale (Zaichkowsky 1985)

To you, to what degree is the game you are about to play...

Unimportant	1	2	3	4	5	6	7	Important
Of No Concern	1	2	3	4	5	6	7	Of Concern
Irrelevant	1	2	3	4	5	6	7	Relevant
Means Nothing To Me	1	2	3	4	5	6	7	Means A lot To Me
Useless	1	2	3	4	5	6	7	Useful
Worthless	1	2	3	4	5	6	7	Valuable
Doesn't Matter	1	2	3	4	5	6	7	Matters To Me

Curiosity items from the State-Trait Personality Inventory (Spielberger et al. 1979)

Please identify how you feel right now before playing the game…

	Not at all		**Somewhat**		**Moderately**		**Very Much**

I feel curious	1	2	3	4
I feel bored	1	2	3	4
I feel disinterested	1	2	3	4
I feel eager	1	2	3	4
I feel like exploring my environment	1	2	3	4
I feel inquisitive	1	2	3	4
I feel interested	1	2	3	4
I feel in a questioning mood	1	2	3	4
I feel stimulated	1	2	3	4
I feel mentally active	1	2	3	4

At this point please stop, you will continue this survey when you are finished the game!

Please don't look at these questions until you have finished playing the game.

Flow State Scale (Engeser and Rheinberg 2008)

Please answer the following questions based on your experience while playing the video game...

I was totally absorbed into the task	**1**	**2**	**3**	**4**	**5**	**6**	**7**

I lost track of time	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I was completely lost in thought	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I felt just the right amount of challenge while playing	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I had no difficulty concentrating on the game	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I knew what I was doing each step of the way	**1**	**2**	**3**	**4**	**5**	**6**	**7**
My thoughts ran fluidly and smoothly	**1**	**2**	**3**	**4**	**5**	**6**	**7**
My mind was completely clear	**1**	**2**	**3**	**4**	**5**	**6**	**7**
My thoughts seemed to happen naturally and on their own	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I felt that I had everything under control	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Flow Questionnaire (Csikszentmihalyi and Csikszentmihalyi (1988)

Please read the following quotes, the next few questions are based on it.

"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 else. 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. When I start, I really do shut out the world. I am really quite oblivious to my surroundings after I really get going. I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the world. Once I stop I can let it back in again."

"I am so involved in what I am doing. I don't see myself as separate from what I am doing."

Did you feel the experience that the quotes explained at ANY POINT while playing the game?

Yes_____ No_____

If you answered yes to experiencing the described feeling during the video game trial, for how long did you experience what the quotes described for?

A Few Seconds Time	1	2	3	4	5	6	7	The Whole
Rarely	1	2	3	4	5	6	7	Often

If you answered yes to experiencing the described feeling, was it more towards the…

Beginning	1	2	3	4	5	6	7	End

Please describe at what point(s) you did.

_____

Please describe the emotions you feel right now…

Negative	1	2	3	4	5	6	7	Positive
Bad	1	2	3	4	5	6	7	Good
Sad	1	2	3	4	5	6	7	Happy

To what degree what the game challenging?

Not at all	1	2	3	4	5	6	7	Very Much

To what degree did the game test your skills?

Not at all	1	2	3	4	5	6	7	Very Much

Do you feel that you learnt something new from this trial?

Not at all	1	2	3	4	5	6	7	Very Much

Do you feel that your level of competence related to playing videogames has increased?

Not at all	1	2	3	4	5	6	7	Very Much

How much did you know about augmented reality when you started playing the game today?

Nothing	1	2	3	4	5	6	7	A lot

What proportion of the time did you spend playing in augmented reality?

None	1	2	3	4	5	6	7	The Entire Time

Would you want to play the game again?

Not at all	1	2	3	4	5	6	7	Very Much So

What did you think about the game?

Bad	1	2	3	4	5	6	7	Good
Negative	1	2	3	4	5	6	7	Positive
Dislike	1	2	3	4	5	6	7	Like

Please list any **SUGGESTIONS** you have for the company who is designing this game in regards to things you would like to see ADDED, REMOVED or CHANGED.

_____

_____

_____

_____

_____

If you didn't already put this information in the first question, what did you **DISLIKE** about the game? Please put in order starting with the thing you DISLIKED the most.

_____

_____

_____

_____

_____

If you didn't already put this information in the first question, what did you **LIKE** about the game? Please put in order starting with the thing you LIKED the most.

_____

_____

_____

Were the game controls and gameplay easy or difficult to pick up on?

Difficult 1 2 3 4 5 6 7 Easy

Which device did you use to play the game?

iPhone_____ iPad_____

How much should that mobile game cost when it hits the market? $_____

How far into the game did you make it? Level _____

How often do you play video games (e.g. once a day, twice a week)?

_____

How much do you know about video games?

Nothing	1	2	3	4	5	6	7	Alot

Are you a gamer?

Not at all	1	2	3	4	5	6	7	Very Much So

What games have you been playing in the last month?

_____

In the last 6 months?

_____

What compels you to download a mobile game?

_____

Please name the game you have played that is most similar to this game.

_____

Today you played a mission located in your immediate surroundings. Would you be willing to walk to different location within your neighborhood to use AR abilities?

Yes _____ No _____

If so how far would you be willing to walk to play a game like this?

_____

If not, what if anything could the game do to make walking to a location more interesting to you?

_____

Were you given an information sheet about augmented reality before participating?

_____Yes **_____No**

How many people were playing the game at the same time as you?

_____Alone **_____One other** **_____Two Others** **_____Three Others**

What is your gender (please circle): a. Female b. Male

Age: _____

What is your proficiency with the English language?

Poor 1 2 3 4 5 6 7 Fluent

Debriefing Statement

The primary purpose of this study is to inform Zenfri Inc. regarding which aspects of their game need improvement and which aspects are strengths so that they can deliver the best possible product to the market.

The information from this research is also being used for my dissertation research related to the psychological state of flow. Flow is complete mental absorption and attention to an activity where one seems to forget about time and is lost in what they are doing. Flow is typically a positive and enjoyable state of mind. This study was part of a series of studies trying to understand how best to facilitate people entering flow in different contexts and both the positive and negative consequences that the state of mind can have on people. If you had difficulty in any of the tasks that is natural as some of the tasks were specifically chosen and designed to be new to you as level of prior knowledge influences the flow experience and is a variable of interest to us.

We had you play a mobile game because it provides an opportunity to enter flow. We measured your enjoyment of the experience and how involved you were with the task to demonstrate whether you entered flow or not. We expect that those with a moderate level of prior knowledge would be curious about the outcomes and thus interested and entered flow. We hypothesized that flow is a function of how curious you are towards the game/task where curiosity increases the likelihood of entering and the intensity of flow. If you have any questions about the results please contact myself at [redacted].

Appendix G- Essay 2 Study 3 Measures

INFORMED CONSENT FORM

Researchers: Dr. Kelley Main, Associate Professor in Marketing, Ray Lavoie, PhD Student in Marketing
[redacted]

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. Please take the time to read this carefully and to understand any accompanying information.

This survey will take approximately 7 minutes and will consist of several parts which are explained below. After reading the description, please select either "Yes" or "No" corresponding to whether or not you wish to participate in the study.

In this study with how people experience music when searching online. You will be given two random reviews of the song then asked to listen to a piece of music and to explain your experience. We will then ask you some questions about yourself.

All responses to the questionnaires will be kept on a USB in a locked office accessible only to the primary researchers. There is no identifying information asked for on any of the questionnaires. These research projects have been approved by the Joint Faculty Research Ethics Board of the University of Manitoba. If you have any concerns or complaints about any of these projects, you may contact the above-named persons. Your response on this form indicates that you have understood to your satisfaction the information regarding participation in the research projects and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from any of the studies at any time, and/or refrain from answering any questions you prefer to omit, without prejudice. Your continued participation should be as informed as your initial consent. The data from the study will be used only for academic research. No part of the data will be sold or used for any commercial purpose.

Please choose below

- ❍ Yes, I would like to participate
- ❍ No, I do not want to participate

In this study we are interested in how people experience music online when searching for new music. To simulate the experience you will be presented with two online reviews and then asked to listen to the track. We will ask you about your experience listening to the music afterwards.

Negative Review Condition

Song Review 1: “I didn't like the way they mixed the fades with each other. They seemed to be choppy and too distinct from each other. The same for the bass and the drops, they didn’t work together. Not much synchrony throughout."

Song Review 2: “I didn't like this piece of music. They did not put the highs and lows together very well. I also did not like how they contrasted the different beats, they didn’t fit together. Confusing song.”

Positive Review Condition

Song Review 1: “I really liked the way they progressively transitioned with the fades to harmonize the different beats into one continuous rhythm. The bass was also mixed perfectly with the drops. Incredible synchrony throughout.”

Song Review 2: “Really nice piece of music. They had a nice balance of ups and downs. I liked how they contrasted different beats throughout, they really fit with each other. Powerful song.”

Please start listening to the clip. The play button is on the left side of the display bar and the volume control is on the right side.Once the clip has finished the green "next" button will appear on the bottom right of the screen and you will be able to go forward.

No Curiosity Condition Manipulation

Before listening to the full song we are giving you a 40 second preview. The play button is on the left side of the display bar and the volume control is on the right side. You can click anywhere on the grey bar to jump ahead to different parts of the song. The page will auto-advance to the full song for you once the 40 seconds is up.

Please listen to the full song. The play button is on the left side of the display bar and the volume control is on the right side. Once the clip has finished the green "next" button will appear on the bottom right of the screen and you will be able to go forward.

Flow State Scale (Engser and Rheinberg 2008)

Please answer the following questions based on your experience while listening to the FULL SONG…

	Not At All			Partly			Very Much
I lost track of time	❍	❍	❍	❍	❍	❍	❍
I was totally absorbed into the song	❍	❍	❍	❍	❍	❍	❍
I was completely lost in thought	❍	❍	❍	❍	❍	❍	❍
I felt just the right amount of challenge in understanding the song	❍	❍	❍	❍	❍	❍	❍

	Not At All			Partly			Very Much
My thoughts ran fluidly and smoothly	❍	❍	❍	❍	❍	❍	❍
I had no difficulty concentrating	❍	❍	❍	❍	❍	❍	❍
My mind was completely clear	❍	❍	❍	❍	❍	❍	❍
My thoughts seemed to happen naturally and on their own	❍	❍	❍	❍	❍	❍	❍
I knew what I was doing each step of the way	❍	❍	❍	❍	❍	❍	❍
I felt that I had everything under control	❍	❍	❍	❍	❍	❍	❍

Flow Questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988)

Please read the following quotes. The questions that follow are based on them.

“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 else. 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. When I start, I really do shut out the world. I am really quite oblivious to my surroundings after I really get going. I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the world. Once I stop I can let it back in again.”

“ I am so involved in what I am doing. I don’t see myself as separate from what I am doing.”

Did you feel the experience that the quotes explained at ANY POINT while listening to the FULL SONG?

- ❍ Yes
- ❍ No

Manipulation Check

Were the reviews of the song that you read before listening.....

	1	2	3	4	5	6	7
Negative:Positive	❍	❍	❍	❍	❍	❍	❍
Bad:Good	❍	❍	❍	❍	❍	❍	❍

What did the people who reviewed the song think of it....

	1	2	3	4	5	6	7
Disliked It:Liked It	❍	❍	❍	❍	❍	❍	❍
Not in favour of it:Were in favour of it	❍	❍	❍	❍	❍	❍	❍

Did you like the clip of music?

- ❍ Not At All
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ Very Much So

How familiar are you with how to make electronic music?

	1	2	3	4	5	6	7
Not at all familiar:Very familiar	❍	❍	❍	❍	❍	❍	❍

Do you like electronic dance music?

- ❍ Not At All
- ❍
- ❍
- ❍
- ❍
- ❍
- ❍ Very Much So

Had you heard the song in the clip before?

- ❍ No
- ❍ Yes

How old are you?

_____ years

Are you....

- ❍ Male
- ❍ Female

Is English your native language?

- ❍ Yes
- ❍ No

Debriefing Statement

In this study we were concerned with the psychological state of flow- being completely engaged or immersed into an activity. We had you listen to a clip of music because it is common to experience flow when listening to music. However, if you do not like the type of music it is unlikely for you to experience flow. We tried to see if information about the type of music would help those who do not like the genre to experience flow. Some of you would have received positive or negative information. We wanted to see how that information influenced your flow experience.

If you want to see the results of this study please email [redacted]. Results will be available in approximately one years time.