MOOD MANAGEMENT THEORY IN VIDEOGAMES: INVESTIGATING THE RELATIONSHIP BETWEEN GAME SELECTION, GAME SWITCHING, IN-GAME CHOICES, AND MOOD REPAIR

A Thesis Submitted to the
College of Graduate and Postdoctoral Studies
In Partial Fulfillment of the Requirements
For the Degree of Master
In the Department of Computer Science
University of Saskatchewan
Saskatoon

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ABSTRACT

Maintaining a healthy balance between positive and negative moods is important for mental health. One of the primary benefits of playing videogames is its capacity for mood regulation. Recent studies investigating the psychological effect of playing videogames have shown that videogames exhibit greater potential for improving mood and attenuating negative affect, including boredom, stress, and depression, compared to traditional non-interactive media.

In addition to the role of media content consumption for repairing mood, it is also known that an individual's mood affects their choice of media content, an effect known as "selective exposure theory" (SET). SET centralizes on the individual's tendency to consume certain media content that reduces their negative affective states and promotes positive moods. The effect of SET has been demonstrated for traditional media (e.g., books, movies, music, television) in both manipulated studies and in the wild. For example, bored TV viewers reduce boredom by watching exciting programs, and elevated stress was associated with increased consumption of comedy and decreased consumption of news.

Recently, patterns predicted by SET were shown in videogame consumption in a laboratory setting: participants showed different preferences for task demand level in a game in response to induced stress and induced boredom. However, how selective exposure for mood repair occurs in vivo has not been explored. Do players actively choose different games to accommodate different mood states or do they play the same game but choose different game modes to tailor their experience to their present mood? What do players do in the game to cope with negative emotions in real life? Without this knowledge, designers and researchers cannot optimize the design of games and game features for mood repair.

To understand the motivations of players in terms of selecting and switching gaming content, specifically what in-game choices or strategies players employ to cope with negative emotions, and subsequently how these choices facilitate their mood management processes, we conducted a study by surveying 194 US players on how their mood influences their gaming behaviors. We used quantitative analysis to find correlations and patterns among participants' media consumption, gaming habits and demographic data, and used conceptual thematic analysis to look deeper into retrospective reflection of how participants' gaming experiences affected their mood states, and to generate insights behind players' daily gaming experience.

Our results suggest that "Mood" is the primary reason for players to be actively playing multiple games within the same period of time, and "Mood" is also the primary determinant of game selection and game switching. Besides choosing different games, players also choose different game modes or choose different playstyles to tailor their gaming experience for their moods. Our findings might help game designers to understand how players make gaming decisions based on their mood states and design games with greater affordance for mood repair.

ACKNOWLEDGEMENTS

I would first like to thank my supervisor, Regan Mandryk for being amazing, patient and supportive, and for helping me and guiding me to study for this research topic that I'm interested in passionate about. Secondly, I would like to thank Cody Phillips for helping me go through a difficult period in writing, for both his editing supervision and emotional support. And I would also like to thank Cale Passmore for his advice on qualitative analysis and writing structure, and Matthew Miller for his help with data collection. I also want to thank the staff in the department of Computer Science for doing a great job and supporting all the grad students and researchers, as well as all the awesome members of the HCI Lab for their support. Finally, I want to thank Anne, Parker, Sophie, Venkat and my family for supporting my study, helping in my life and being there for me.

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MMT   Mood Management Theory

SET   Selective Exposure Theory

EGA   Extraneous Game Advantage

CHAPTER 1:   INTRODUCTION

1.1   BACKGROUND

Video games are now a leading form of entertainment. While there are many motivations behind why people choose to play, one of the motivational draws is the ability to self-regulate mood. The ability to self-regulate mood by playing is a driving factor behind why people choose to play and why people choose certain games, and has broader implications for the benefits of playing.

Achieving a healthy balance between positive and unpleasant moods is essential for mental health and plays an important role in how people manage their time and lifestyle (Taquet, Quoidbach, De Montjoye, Desseilles, & Gross, 2016). In effect, self-regulation of emotions supports multiple individual functions and boosts mental well-being. Failing to regulate mood and emotions is a common characteristic in the development of mental illness (Bradley, 1990; Gross & Muñoz, 1995). It's suggested that failing to develop affect regulation abilities could lead to adult psychological disorders (Greenspan & Porges, 1984).

A growing body of studies investigating the psychological effects of playing videogames has emerged, providing insights into the mood repair and emotional regulation benefits of videogame play. Videogames serve to improve mood and attenuate negative affect (Y. Chen & Raney, 2009; Hemenover & Bowman, 2018; Reinecke, Klatt, & Krämer, 2011; Villani et al., 2018), such as stress (Russoniello, O'Brien, & Parks, 2009; Wack & Tantleff-Dunn, 2009), depression and frustration (Ferguson & Rueda, 2010; Valadez & Ferguson, 2012), resulting from in-game success (Rieger, Wulf, Kneer, Frischlich, & Bente, 2014), high task demand (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010) and social play (Hussain & Griffiths, 2009). Ravaja (Ravaja, Saari, Salminen, Laarni, & Kallinen, 2006) and Reinecke (Reinecke & Trepte, 2008) also investigated the mood repair effect of videogames from a psychophysiological perspective, showing videogame play elicits higher level of arousal. With that being said, it's not a surprise that mood repair has become one of the primary motivations for people to play video games, and that gamers report that they use videogames to regulate their mood more frequently than irregular gamers (Gaetan,

Bréjard, & Bonnet, 2016), especially after stressful and exhausting situations (Reinecke, 2009). This motivation to play is also seen in children (C. K. Olson, 2010) and adolescents (Raney, Smith, & Baker, 2006).

Mood management theory (MMT) proposes that the consumption of entertainment content could alter an individual's current mood state. In effect, individuals are inclined to interact with entertainment in order to reduce negative affective states and to maintain or enhance positive moods (Zillmann, 1988, 2000, 2015). Similarly, selective exposure theory (SET) in mass media and communication refers to individuals' tendency to seek out media content that conforms to their individual emotional and cognitive needs. MMT and SET each have profound implications in the area of media content consumption. Research has investigated how individuals' mood states impacted their consumption pattern of media content (e.g., TV programs, movie genres and music) and how media content could serve as an effective tool for mood repair and emotion regulation. For example, studies on MMT and music show that music listeners could improve their mood by choosing to listen to energetic-joyful music (Knobloch & Zillmann, 2002), and romantically-satisfied people prefer love-celebrating music as compared to romantically discontent people, who prefer love-lamenting music performed by artists of their own gender (Knobloch & Zillmann, 2003). Studies on SET and TV viewing show that TV viewers reduce boredom by watching exciting TV programs and reduce stress by watching relaxing programs (Bryant & Zillmann, 1984; Dittmar, 1994; Potts & Sanchez, 1994), and stress was associated with increased consumption of comedy and decreased consumption of news (D. R. Anderson, Collins, Schmitt, & Jacobvitz, 1996).

As videogames become increasingly popular in the market, researchers have begun studying MMT and SET on the consumption of videogames. A study conducted by Chen (Y.-S. Chen & Raney, 2009) compared three media of different interactivity levels (a motion-sensing videogame, a Flash game and a video clip) on mood repair effect, showing that higher interactivity leads to significantly greater positive mood. Similarly, Rieger's study (Rieger, Frischlich, Wulf, Bente, & Kneer, 2015) shows that compared to non-interactive media, videogames elicit greater mood repair effect, higher physiological arousal and higher subjective arousal. The results also suggest that the mood repair effect of videogames is achieved through both higher task demand and higher arousal. Several studies delved deeper into the connection

between selectivity of videogames and task demand. For example, Reinecke's study (Reinecke et al., 2012) shows that, when provided with different task demand levels of a videogame, subjects' choices significantly correlate with thwarted intrinsic needs, and the fulfilment of these needs through gameplay correlates with enjoyment. Bowman (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010) conducted a series of experiments to study how players choose different levels of task demand of the game in response to induced stress and boredom, revealing the heightened intervention potential of videogames increases its ability for mood regulation.

1.2 PROBLEM

Selective exposure has been demonstrated on traditional media in both laboratory experiments (Bryant & Zillmann, 1984; Christ & Medoff, 1984; Helregel & Weaver, 1989; Wakshlag, Vial, & Tamborini, 1983; Zillmann, Hezel, & Medoff, 1980) and diary studies (D. R. Anderson et al., 1996; Dittmar, 1994; Pearlin, 1959), The pattern that stressed people watch more relaxing programs and bored people watch more exciting programs, has been observed in both lab experimental data and in-the-wild.

Recent research on SET has been extended to the realm of interactive media, mainly videogames. Although videogames have been shown to afford mood repair (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010, 2011; Reinecke et al., 2012; Rieger et al., 2014), and selective exposure to videogames has been demonstrated in lab settings (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010), how selective exposure for mood repair occurs in vivo, however, has not been explored. For example, do players show different preferences for games (e.g., games of different excitatory homeostasis) to accommodate different mood states or do they stick to their primary game as usual? Do players make different in-game choices to tailor their experience to accommodate their present mood state? What in-game behaviours and choices are popular among players for coping with negative emotions?

The problem is that without this knowledge, designers and researchers cannot optimize the design of games and implement game features for mood repair. By solving this problem,

game designers who wish to integrate greater mood repair effects to their game could better optimize their game design to help players regulate their arousal and optimize mood, because a good experience of relaxation and mood repair will also provide a quality play experience.

As such, the goal of this thesis is: to *understand the motivations of players in terms of selecting and switching gaming content, specifically how players' mood states affect their choice of game and their play choices within a game, and subsequently how these choices facilitate their mood management processes.*

Furthermore, most of the studies have been concentrating on the impact of negative affective states; for this study, we also want to take a holistic approach by exploring the impact of both positive and negative mood states.

1.3 SOLUTION

We break down the problem discussed above into three exploratory research questions of interest (see Chapter 3.1 for how these questions came up and why they are important):

RQ1: Do people choose which game to play in order to facilitate mood repair?

RQ2: Do players switch content **within** a game (e.g., switching game modes or in-game choices) to facilitate mood repair?

RQ3: What in-game behaviors do players engage in to help alleviate negative moods?

To investigate the impact of different mood states on consumption patterns of videogames for players, we want to analyze general patterns as well as self-retrospective gaming experiences, in which case, a sizable sample is needed for validity and generalizability of the result. Therefore, we decided that a survey form would be the appropriate approach to gather data for this study, considering its advantages of high representativeness and low time requirements appropriate for initial inquiry. To make questions for the survey more precise and easier for participants to understand, we designed our survey questions based on a combination of related literature and our focus of research questions.

For data analysis, we determined that we would use mixed methods to analyze participant data. Using quantitative analysis, we were able to find correlations and patterns among

participants' media consumption, gaming habits and demographic data. With conceptual thematic analysis, we could look deeper into retrospective reflection of how participants' gaming experiences affected their mood states, and generate insights behind players' daily gaming experiences.

1.4 EVALUATION

To evaluate how our solutions and findings address the problem discussed above, we will evaluate the three research questions respectively:

For RQ1 ("Do people choose which game to play in order to facilitate mood repair?"), we compare the content consumption pattern of videogames (with the emphasis on selectivity and switching) with traditional media to investigate and gain understanding of players' motivation and usage of selectivity and switching on different games they play in general and especially in the context of mood repair.

For RQ2 ("Do players switch content **within** a game (e.g., switching game modes or in-game choices) to facilitate mood repair?"), we use thematic analysis to summarize players' selective preference affected by their current mood states at the in-game level (e.g., game modes), and conduct cross-analysis with their content consumption pattern at the game-level.

For RQ3 ("What in-game behaviors do players engage in to help alleviate negative moods?"), we explore the various options of in-game behavior that players employ to cope with negative emotions.

1.5 CONTRIBUTIONS

This work makes contributions by providing insight into how players select and switch between games and game content as a way to achieve mood repair. We discuss players' consumption patterns of videogames as compared to their consumption of traditional media, and how those choices impact players' selections and choices within gameplay. Further, we discuss how players use games as coping strategies for dealing with negative affective states. We also examine how different selections of game content, game mode, and playstyle can customize an individual's play experience for mood management. Through these discussions, we also generate

design insights that may help to inform game designers on designing games with greater flexibility for supporting emotional and mental wellbeing.

1.6   THESIS OUTLINE

Chapter 2 discusses and synthesizes related literature. The examination of related work emphasizes content that is relevant to an investigation of mood management in games.

Chapter 3 describes our research questions that arose through synthesis of the literature. This chapter also describes the methodological processes that we employed to address those research questions.

Chapter 4 presents the results of the investigation. The results include both qualitative and quantitative analysis of the data.

Chapter 5 discusses the results outlined in Chapter 4 and situates the discussion through reference to extant literature. It also discusses areas for future work.

Chapter 6 summarizes the thesis and highlights key findings and contributions developed through the research.

CHAPTER 2:   RELATED WORK

This chapter discusses and synthesizes mood management theory (MMT) and selective exposure theory (SET) literature. It highlights empirical evidence of MMT and SET on non-interactive media, along with interactive media. Where possible, we contextualise the relevant literature by examining it through a lens that increases its relevance to videogames and interactive media. The emotional benefits of videogame playing, and the current progress of SET on interactive media are also explored in detail. The chapter concludes with a discussion of contextually relevant gaps in the literature.

2.1 GENERAL USE OF TERMS

2.1.1 Mood

Mood is a long-lasting emotional state that goes from hours to days. A person's mood impacts one's perception and reaction to the environment. Mood and emotion are linked, but mood is distinct from emotion, in that moods are less specific and less intense, emotions may only last for minutes and are generally stronger feelings that associate with reactions to stimuli (Sims, 1988). Moods are commonly described in their valence of positive or negative.

2.1.2 Affective state

Affective state is a psychophysiological concept that involves both psychological and physical processes. Russell (Russell, 1980) asserts that different affective states could be summarized on a two-dimensional scale where one dimension is the pleasure-displeasure dimension and the other is the arousal-sleep dimension. In simplest terms, affect captures both physiological and emotional elements that are experienced in terms of valence and arousal, whereas emotion is somewhat more complex, as it is higher level, includes cultural and contextual influences, is learned, and is labeled with language (Barrett, 2017). Mood is often used to refer to emotions that are longer lasting, and less transient.

2.1.3 Hedonic Valence

Due to the difficulty of measuring specific emotions, hedonic valence (sometimes called hedonic tone) is often used to determine the tone of an emotional experience across one dimension. (Branscombe, 1985; Bryant & Davies, 2006) A higher valence expresses a more positive experience, while a lower valence represents a more negative experience.

2.1.4 Physiological Arousal

Physiological arousal is a marker used to describe the intensity of an emotional experience. It is best characterized as the degree to which you are active or passive, such that high arousal is associated with physiological activity and low arousal is associated with physiological passivity. When physiological arousal is paired with valence, they create a simple but robust two dimensional model of emotion (Russell, 1980).

2.2 MOOD MANAGEMENT THEORY AND SELECTIVE EXPOSURE THEORY

Mood management theory, proposed by Zillman and Bryant, discussed the idea that people will interact with entertainment media in order to self-regulate their mood (Zillmann, 1988, 2000, 2015; Zillmann & Bryant, 1985). The theory centers around the idea of two hedonic premises: first, individuals are driven to eliminate negative mood; second, individuals are motivated to maintain positive mood. As individuals are motivated to seek out a positive mood and avoid a negative mood, an individual will actively arrange internal and external stimuli to minimize exposure to negative stimuli and enhance exposure to positive stimuli to facilitate these intentions (Biswas, Riffe, & Zillmann, 1994; Knobloch-Westerwick, 2013). In effect, this means that people are driven to seek out entertainment that puts them in a positive mood and avoid content that puts them in a negative mood.

Selective exposure theory (Zillmann, 2000) shares similarities with mood management theory . Effectively, exposure to information that contradicts an individual's pre-existing views can cause cognitive dissonance (Festinger, 1962; Rosenzweig, 1972). As a result, individuals will likely strive to avoid contrasting information in order to mitigate negative experiences and produce relative harmony.

Mood management theory suggests that selective exposure to media content is motivated by a media user's present affective state to achieve mood optimization (Biswas et al., 1994; Greenwood & Long, 2009; Knobloch, 2003; Knobloch & Zillmann, 2002b; Larsen, 2000; Meadowcroft & Zillmann, 1987; Reinecke, 2016; Zillmann, Hezel, & Medoff, 1980) and that a moderate level of arousal is more pleasant than low arousal or high arousal (Zillmann, 2015).

In media selection, individuals tend to choose media that will elicit a pleasurable affect and alleviate their dysphoric mood. In effect, people tend to self-moderate their arousal in line with the optimal level of arousal. Bryant and Davies (Bryant & Davies, 2006) acknowledge the four key elements of media that can impact mood management processes: excitatory homeostasis, intervention potential, message-behavioral affinity, and hedonic valence.

2.2.1 Excitatory Homeostasis

Excitatory potential refers to how stimulating a media selection is to the consumer. Relatedly, excitatory homeostasis is associated with the regulation of arousal more generally. Individuals tend to choose media entertainment based on their prevailing arousal level to maintain excitatory homeostasis. Overstimulated persons (which results in stress) tend to seek out relaxing content and under-stimulated persons prefer arousing fare, as shown in Bryant and Zillmann's study on television viewing (Bryant & Zillmann, 1984). A survey study on U.S. families (D. R. Anderson et al., 1996) showed that stressed persons watched more comedy than bored people. Researchers found similar patterns in music consumption and Web-surfing. Knobloch's study (Knobloch & Zillmann, 2002) showed that listening to energetic and joyful music could ameliorate negative mood, while Friedman (Friedman, Gordis, & Förster, 2012) found that sad people were disinclined to listen to happy songs because they felt inappropriate. Mastro (Mastro, Eastin, & Tamborini, 2002) found that the Web-surfing pattern of stressed participants was in a slow manner (which was under-stimulating) and bored participants surfed more rapidly (which was over-stimulating).

2.2.2 Intervention potential

The intervention potential of a message or content is its capacity to attract the audience's cognitive attention to process the information. Both Reinecke (Reinecke, 2009) and Bowman (Nicholas D. Bowman & Tamborini, 2012) propose that videogames may have a higher

intervention potential than other forms of media due to the fact that videogames tend to be innately interactive. Bowman's studies show that higher task demand in videogames contributes to greater distraction from the individual's cognitive attention on negative mood (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010). Videogames tend to have higher attentional demands than non-interactive media (Grodal, 2000). In addition to this, videogames have also been shown to elicit higher levels of physiological arousal (Ravaja et al., 2006; Reinecke & Trepte, 2008) as well as higher levels of subjective arousal (Bowman & Tamborini, 2012).

2.2.3 Message-behavioral affinity

Message-behavioral affinity refers to how much the valence of media content resembles the individual's current emotional state. It's believed that the higher degree of message-behavioral affinity of the media content is to the individual, the less potential of it to change the individual's affective state. Several studies (Medoff, 1982; Wakshlag et al., 1983; Zillmann et al., 1980) have shown strong evidence for this assumption, but experiments on the relationship between message-behavioral affinity and videogames have yet to be conducted.

2.2.4 Hedonic Valence

Hedonic valence refers to the valence nature of the media content on a continuum from positive to negative. Mood management theory postulates that people in a negative mood state prefer media content with positive hedonic valence. Interestingly, a combination of hedonic valence and intervention potential produces different outcomes. Studies have shown that media messages with positive valence and low intervention potential alleviate people's negative mood but a combination of positive valence and high intervention potential aggravates aggressive feelings (Allen, Dalessio, & Brezgel, 1995; Zillmann, Bryant, Comisky, & Medoff, 1981).

2.3 SELECTIVE EXPOSURE THEORY ON NON-INTERACTIVE MEDIA

A large part of mood management theory literature focuses on how negative mood states can impact an individual's selection patterns for non-interactive media (e.g., an individual's selection of television programs, movie genres and music). Individuals use television viewing and movies as a way to regulate their negative emotions (Larson, 1995; Moskalenko & Heine,

2003). In line with Bryant and Zillmann's findings (Bryant & Zillmann, 1984), extended studies (D. R. Anderson et al., 1996; Greenwood & Long, 2009) revealed that individuals watch television to self-regulate their arousal level, in order to overcome stress and boredom. Studies investigating the correlation between television viewing and depression suggest that depressed persons tend to avoid potential stressors by engaging with television viewing; however news programming may trigger or exacerbate depression or negative mood for female viewers (Dittmar, 1994; Helregel & Weaver, 1989; Meadowcroft & Zillmann, 1987; Potts & Sanchez, 1994). In response to annoyance, viewers select to watch different television shows, ensuring that individuals can avoid negative mood states. In the investigation of unpleasant mood and the semantic affinity of media selection, researchers find that consumption of sad romantic music among romantically deprived adults is significantly higher than their peers, as a preventative means from exposing them to the narrative of a successful love relationship (Knobloch, Weisbach, & Zillmann, 2004; Knobloch & Zillmann, 2003). Although participants in this study were only provided 8 love songs to choose from during the experiment, which wasn't inclusive for other music genres (it's possible that some romantically discontent people don't choose to listen to love-themed music to avoid the stressor of love), and participants might not have known the songs provided beforehand, which means that they didn't know what they were getting until they listened to the actual songs.

2.4   VIDEOGAMES, EMOTION REGULATION AND MOOD REPAIR

Extant literature overwhelmingly concludes that videogames are an effective means of reducing negative mood (Valadez & Ferguson, 2012; Villani et al., 2018). The concept of "Regulating feelings" is identified by adolescents as one of their main reason for gaming (C. K. Olson, 2010). Similarly, Grodal asserts that the consumption of media content allows regulation of one's emotions and that videogame media is particularly useful for mood management (Grodal, 2000). Ferguson's study on exposure to violent videogames reveals that playing violent videogames does not result in aggressive behaviors, but reduces hostile feelings and depression (Ferguson & Rueda, 2010).

Furthermore, research by Rieger et al. (Rieger, Frischlich, Wulf, Bentre, & Kneer, 2015), Reinecke et al., (Reinecke et al., 2011) as well as Chen and Raney (Y.-S. Chen & Raney, 2009) provides evidence that videogame play produces a greater degree of mood repair as compared to

traditional and non-interactive media. This suggests that a higher task demand of videogames and increased arousal level of the subject can help facilitate mood repair—particularly from a state of low arousal. Qualitative analysis (Gaetan, Bréjard, & Bonnet, 2016; Hussain & Griffiths, 2009; Olson, 2010; Reinecke, 2009) shows that videogame players use gameplay to alleviate stress, boredom and fatigue after stressful and exhausting situations, and that regular videogame players regulate mood and emotions more frequently than their peers. There is also a large body of research showing increased physiological arousal in response to videogame play (C. A. Anderson & Bushman, 2001; Bushman & Whitaker, 2010; Raney et al., 2006; Ravaja et al., 2006; Reinecke & Trepte, 2008; Segal & Dietz, 1991).

2.4.1 Selective exposure & mood management processes in videogame play

"Interactive media, mainly computer games, have become an important part of the current entertainment landscape." (Granic, Lobel, & Engels, 2014). However, to our knowledge, few studies have investigated the mechanism behind selective exposures and mood management in video gameplay. Bryant and Davies (Bryant & Davies, 2006) proposed that mood repair process is a recovery of physiological homeostasis (e.g., increase the arousal level when an individual is bored). Rieger et al.'s study confirms that the mechanism of mood repair achieved through playing videogames stems from distraction from negative mood states, as well as the capacity of videogame playing to regulate physiological arousal to address the negative cause (Rieger et al., 2015).

On one hand, distraction from an aversive mood state could be attributed to the intervention potential of a stimulus, and the higher task demand of videogames leads to higher intervention potential (Grodal, 2000). Chen and Raney (Y. Chen & Raney, 2009) found that although all different media forms could improve positive moods, only interactive media had the effect of reducing negative moods. Bowman and Tamborini (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010) have conducted a series of experimental studies on how task demand of the media content impacts mood repair and selective exposure, based on the intervention potential element in MMT. The first study was set to test the argument that greater intervention potential of the media leads to greater effect of repairing noxious moods. In this between-subjects experiment, intervention potential was operationalized as the level of task demand required of the media, and participants (N=172) were

assigned to play a flight stimulator game with one of the four different levels of task demand (no actions required; cognitive demand required; some actions required; full actions required) after either a boredom or stress induction (randomly assigned). Participants' affective states were measured before and after playing as the measure of mood repair effect. The results supported the hypothesis that task demand was positively correlated with mood repair effect for both bored and stressed subjects from the lowest level to moderate level, however, too much task demand would be adverse for mood repair. The second study looked into the validity of using the naturally occurring task demand/player engagement (operationalized as level of user control coded from video recording of the participant's input) as a predictor of mood repair effectiveness. The study procedure is similar to the first study except, after mood induction (boredom and stress), participants all played the flight simulation game at the high-level task demand (full actions). Result showed that higher keyboard engagement significantly predicted greater mood repair, and increased engagement of control input reduced boredom but not stress.

The third study was designed to test the impact of noxious mood states on selective exposure to the level of task demand on videogames, and the resultant mood repair effect. In this study, participants (N=64) were asked to play the flight simulator game at all three levels of task demand (high, low and moderate) to obtain expectation of different levels of task demand. After a mood induction (boredom and stress), they were asked to choose the level of task demand they wished to play. The results showed that participants in both noxious mood states preferred moderate level of task demand the most, and low level of task demand the least, and stressed participants significantly favored moderate level of task demand over the bored. No significant difference of mood repair effect at moderate level of task demand was found between bored and stressed participants.

Videogames were shown to be able to regulate players' arousal level, restore physiological hemostasis and attenuate the cause of negative moods. Further, it's shown that playing videogames could regulate negative arousal patterns for sadness (Russell, 2003).

2.5 SELF-DETERMINATION THEORY AND NEED SATISFACTION THEORY

Recently, a growing body of research has focused on characterizing the mood management process from satisfaction of intrinsic needs within the frame of Self-Determination Theory and its effect on SET and mood regulation (Reinecke et al., 2011; Serrezuela, Cardozo, Ardila, & Perdomo, 2017; Tamborini, Bowman, Eden, Grizzard, & Organ, 2010; Tamborini et al., 2011). Reinecke (Reinecke et al., 2012) argues that traditional MMT research has largely focused on hedonic regulation for arousal and affect, overlooked the intrinsic need satisfaction function of media, and that mood repair through media is not only achieved by distracting the user from negative state and regulating arousal, but by addressing the source of negative states by satisfying the thwarted intrinsic needs that originally caused aversive states.

Self-Determination Theory is a theory of human motivation and personality (Deci & Ryan, 2000; Ryan & Deci, 2000; Tamborini et al., 2010). The theory describes the degree to which human behaviors are volitional or self-determined, and can be categorized along a spectrum of self-determined regulation. On one end of the spectrum, the most self-determined form of behavioral regulation is intrinsic motivation, with which an individual participates and exerts effort in the activity for the pleasure from the activity itself, such that it becomes an autotelic experience. Extrinsic motivation refers to human behaviors being performed for an outcome unrelated the activity itself. On the other end of the spectrum is amotivation, referring to being unmotivated.

Cognitive evaluation theory is one mini-theory of SDT, which postulates three fundamental psychological needs that are essential for an individual's intrinsic motivation: autonomy (the power to make one's own choices), competence (the ability to effectively perform the task and experience mastery) and relatedness (the connection with others).

In the field of videogame playing, from the prospective of SDT, enjoyment is defined as intrinsic need satisfaction (Peng, Lin, Pfeiffer, & Winn, 2012; Przybylski, Rigby, & Ryan, 2010; Przybylski, Ryan, & Rigby, 2009; Ryan, Rigby, & Przybylski, 2006; Serrezuela et al., 2017). Studies by Ryan (Ryan et al., 2006) and Tamborini et al. (Reinecke et al., 2011; Tamborini et al., 2010) support the assertion that videogaming has the capacity to satisfy the need for autonomy

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and competence, and mood repair through game play could be achieved by addressing these thwarted needs that caused negative affect. This perspective provides valuable extension to the study of MMT and the mechanism underlying mood repair through the use of videogames.

2.5.1 Measures of Self-Determination

Many questionnaires were developed to measure different constructs within SDT to aid research on SDT in different contexts. The Intrinsic Motivation Inventory (IMI) is a questionnaire designed to evaluate participants' self-report experience towards a given activity using six sub-scales. The interest/enjoyment subscale is considered to be a subjective measure of one's intrinsic motivation (Reynolds, 2006).

2.6 EXTRANEOUS GAME ADVANTAGES

Besides game selectivity and in-game customizations provided by the game designers, another option for players to tailor their gaming experience is through game mods and cheat codes that aren't originally integrated by the developers. To better contextualize and capture the gaming behaviors within such range, we use the term Extraneous game advantages (EGAs), referring to games "played within the game mechanics but in ways unintended by the game designer, using, e.g., cheat codes, walkthroughs, game mods, loopholes/exploits)".

Studies on the usage of EGAs (mainly cheats) in videogames help us understand the psychological aspect underlying players' behavior of using cheats, despite the social stigma arising around such behavior in the recent years. Consalvo's qualitative study (Consalvo, 2007) on cheating in videogames summarizes four primary motives of using cheats: "feeling 'stuck'", "wanting to 'play god'", "feeling bored with the game" and "wanting to be a jerk to other players". From the perspective of mood management, players who are "feeling 'stuck'" use cheats as a means to reduce the frustration of "being stuck" and those who are "feeling bored with the game" use cheats to attenuate boredom. Doherty's experimental study (Doherty et al., 2014) captures a border range of 12 reasons players cheat, among which players reported they did it for "emotional reasons".

These studies provide evidence players use EGAs for mood benefits in some occasions. A player could use EGAs to resolve the their frustration caused by reoccurring failure in the

game (e.g., failing to defeat the boss of a level, being stranded in the progress advancement) by using EGAs to advance in the game progress where the player was otherwise "stuck", or to customize the player's gaming experience and reduce boredom of repetitive game mechanics by using EGAs to unlock novel features or mechanics in the game that weren't provided by the game developers.

Therefore, EGAs could be seen as extensive tools for players to use for mood repair (perhaps especially when game selectivity is limited), and players' usage of EGAs is a behavior worth looking into when investigating their selectivity and behaviors for mood repair in the wild.

2.7 GAPS IN THE LITERATURE

While there is a wealth of research exploring mood management with traditional media, videogame consumption has been sparsely investigated. There is some evidence supporting the idea that the interactive nature of video games may alter their impacts on mood management (Y.-S. Chen & Raney, 2009), yet this has not been explored in great detail.

In the research on traditional media, the impact of consumers' mood states (especially negative moods) on their selectivity of content has been well explored both in laboratory settings (Bryant & Zillmann, 1984; Christ & Medoff, 1984; Helregel & Weaver, 1989; Wakshlag et al., 1983; Zillmann et al., 1980) and in the wild (D. R. Anderson et al., 1996; Dittmar, 1994; Pearlin, 1959). However, in the research on interactive media (namely videogames), the impact of negative mood states on players' gaming selectivity has only been demonstrated in controlled experiments in lab (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010; Y. Chen & Raney, 2009), but not yet in the wild. We understand how selective exposure occurs in laboratory settings when the players were provided with games chosen by the researchers, which may or may not be their game of choice for mood repair in real life. Based on this, we don't know how selective exposure affects players' selection choices on gaming content, their experience more generally, and the mood repair effect in their daily life. Whether players choose different games, change difficulty setting, switch game modes, or play with different strategies or characters has yet to be explored in the literature.

Further, the literature has not made any attempt at discussing the effect of selective exposure on content selections that occur within a single game (e.g., choice of game modes). It is unclear whether or not players switch between different game modes to regulate intervention potential or hedonic valance, in support of mood repair, nor do we know whether they change their in-game choices and behaviors to accommodate their affective mood states.

By filling these gaps, we will have a better understanding on players' consumption pattern, the impact of mood states on game selectivity and how players utilize selectivity to facilitate mood repair in real life, complementary to the existing knowledge of selective exposure in videogames.

Chapter 3: Methodology

3.1   Research Questions

Explorative studies are considered a cornerstone of Human-Computer Interaction research (Cockburn, Gutwin, & Dix, 2018). As we do not have clear hypotheses, to help address the gaps identified in the literature in section 2.4, we formulated several exploratory research questions:

RQ1: Do people choose which game to play in order to facilitate mood repair?

As described in Section 2.3, on traditional media, consumers in different mood states choose different content/genres to facilitate mood repair (Greenwood & Long, 2009; Knobloch & Zillmann, 2002; Larson, 1995; Medoff, 1982; Potts & Sanchez, 1994; Wakshlag & Vial, 1983). For example, bored people select exciting TV programmings to overcome boredom (Bryant & Zillmann, 1984), stressed women tend to watch more games and variety programming (D. R. Anderson et al., 1996) and depressed women watched more soap operas (Dittmar, 1994). Videogames are proven to have a significant effect of emotion regulation and mood repair (Y. Chen & Raney, 2009; Hemenover & Bowman, 2018; Hussain & Griffiths, 2009; Reinecke, 2009; Russoniello et al., 2009; Valadez & Ferguson, 2012; Villani et al., 2018); however, do videogame players choose different games to play in order to accommodate different mood states? Content switching is easy and common on traditional media (e.g., "zapping" on TV), but considering the different distribution model, lower accessibility, and higher cost of videogames, combined with the time investment that players make into a single game title ("GameLengths," 2020), we suspect that switching content in the context of playing video games is not as easy compared to traditional media. This may limit players' options in terms of switching videogame content to facilitate mood repair. By examining user consumption patterns, we may gain insight into the extent that players are self-regulating mood through their game selections.

RQ1.1: Do people actively play a variety of games? We have a limited understanding of whether (and to what extent) people play a variety of games within the same general period of time. Gaining insight into whether or not people play a variety of games in the same general period of time will allow us to further explore whether or not game switching occurs within that

epoch in a similar way to traditional media, in which people may watch multiple television series at the same time.

RQ1.2: If people switch between games, what is their motivation for doing so? We seek to explore the motivations that people discuss in terms of switching between games. In particular, we are interested if game switching occurs in relation to mood repair, and want to ask about overall motivations to determine whether players are aware of their selections based on self-management of mood.

RQ1.3: Do people switch between videogames to facilitate mood repair? Of primary concern, we seek to understand whether and to what extent people switch between videogames to facilitate mood repair. This question helps to answer RQ1 from the lens of people who switch video games. The switching phenomena is of particular importance because of the research gap that exists in terms of showing a link between mood management theory and video game switching preferences.

RQ2.0: Do players switch content within a game (e.g., switching game modes or in-game choices) to facilitate mood repair?

While similar to RQ1, RQ2 seeks to explore the extent to which people make an *in-game* choice to better facilitate their mood repair. Video games afford players with a variety of choices that theoretically afford them control over the game's intervention potential and hedonic valence, without the need to switch games entirely.

RQ2.1: When different game modes are available, do people choose different modes to facilitate mood repair? The innately interactive nature of videogames often affords players with the option of selecting between various game modes. These game modes exist to allow the player to moderate their player experience to fit their subjective preferences, yet still get to play the same game without sacrificing their familiarity and learned skill level with the game. The selection of game mode may be as important as the selection of the game itself, as game mode can moderate gameplay in a variety of dimensions. Game mode selections include (but are not limited to), single player versus multiplayer game modes, competitive ranked versus recreational game modes, Player Versus Player (PVP) as opposed to Player Versus Environment (PVE) game modes—all of which are candidates for dramatically changing the tonality of the player

experience. In addition to these, players may moderate the game's difficulty or the game's objective, which could substantially influence the player experience. Understanding whether people select or adjust their game mode based on their subjective mood may yield interesting insights and could potentially inform the design and development of game modes in future games to optimize mood repair.

RQ2.2 What other adjustments in gameplay do players make based on their current mood state? While having a variety of game modes is a common feature, not all games include a variety of game modes. However, we anticipate that games with sufficiently complex gameplay will allow players to create emergent modalities (i.e., a player can create and experience their own informal game modes), especially in games with more open virtual worlds. Understanding the types of emergent modalities that players engage with in the absence of formal game modes may yield insight into the degree that players seek to self-regulate their mood during gameplay.

RQ3: What in-game behaviors do players engage in to help alleviate negative moods?

There is a wealth of evidence supporting the idea that people play games for catharsis. However, it is unclear what in-game behaviors players are engaging with in order to alleviate their negative mood. A richer understanding of which behaviors result in mood-repair will offer valuable insight for people wanting to explore how to create games for mood repair.

3.2 RESEARCH METHOD OVERVIEW

Due to the explorative nature of our research questions (see Section 3.1), we identified self-retrospective experience and opinions from a generalizable population as our method of choice. As our investigation requires a large volume of exploratory data, we determined that a survey was the appropriate methodology for data collection (J. S. Olson & Kellogg, 2014). With consideration of background literature and our research questions, a survey was designed (see Section 3.3) and administered to participants through Amazon's Mechanical Turk platform (see Section 3.4). Following data collection, qualitative and quantitative analyses were conducted with SPSS 24.0 (see Section 3.5).

3.3　Survey Design

Data was collected from a questionnaire (see Appendix A for a full version of the questionnaire), which was designed to investigate players' consumption of traditional media versus interactive media (mainly videogame media). The survey explored what decisions people make during gameplay (e.g., game selection, game mode selection) to adjust their gaming experience for their mood at the moment, their primary coping strategies for negative emotions (e.g., frustration, stress and boredom) during gaming, and how they use extraneous game advantages (e.g., cheating, loopholes, online walkthroughs) to facilitate gameplay when other options (e.g., changing game mode) aren't available to tailor their experience, minimize negative aspects and achieve mood repair. Participants responded to these questions through Likert-scale items, checklists for multi-selection questions, or a text-field for open-ended questions. Within the questionnaire, we presented six ordered themes: personal identity measures, play preferences and habits, concurrency of content consumption patterns for traditional media forms and videogames, factors of gaming behavior, mode selection in games and experience of how mood impacts gaming decisions and in-game behaviors, and coping with negative emotions in game and EGA adaptation. (See Appendix A-2 for full survey).

Focus 1. Personal Identity Measures:

To determine whether or not there were demographic impacts on mood management and content selectivity, we collected standard demographic information (e.g., gender, age, household income, etc.) and provided open-ended questions about self-described identity, ancestry and family/community. (See Table 1 for example questions for each focus).

Focus 2. Play Preferences and Habits:

To determine the familiarity of our sample with playing video games, participants were asked about their typical game playing habits. Specifically, how much time they have available for videogame play, weekly playtime, and the genres they usually play. (See Table 1 for example questions).

Focus 3: Content Consumption Patterns for Traditional Media Forms and Videogames:

Participants were given 7 point-Likert scale questionnaires posing whether they tend to concurrently consume multiple instances of that particular form of media (TV, book, podcast and videogames) (e.g., whether they tend to read more than one book during the same period of time; whether they tend to play multiple games during the same period of time). (See Table 1 for example questions).

Focus 4: Determining Factors of Gaming Selectivity:

We asked open-ended questions for reasons why participants prefer playing multiple games or one single game concurrently, determinants of game selection, primary motivation for game-switching, and perceived importance of the availability for various game mode. (See Table 1 for example questions).

Focus 5: Mode selection in games & Experience of how mood impacts gaming decisions and in-game behaviors:

To better understand any potential relationships between mode selections and mood, we asked participants whether their mood influences their in-game behavior and how the game influences their mood. We also asked open-ended question to probe for general themes in relation to gaming experience, gaming behaviors (including in-game decisions) and the effect on and of mood. We asked participants for recollections of two examples of how mood influenced their gameplay or not. (See Table 1 for example questions).

Focus 6: Coping with negative emotions in game and EGA adaptation:

To further understand how players utilize varies strategies to cope with negative emotions, especially when they desire to customize their gameplay experience with modification to the game, we asked participants about their usage frequency of six common strategies when players coped with negative emotions during gameplay by providing participants with a 5 point-Likert scale, the motivation behind their primary choice, and their usage of EGA to alter gameplay experience. (See Table 1 for example questions).

Table 1 Example Questions for Each Focus from the Survey

Focus	Example questions
Focus 1: Personal Identity Measures	*"What is your age?"*
	"Indicate your gender:"
Focus 2. Play Preferences and Habits:	*"How many hours per week do you have available to game (including transit, lunch breaks, while working, etc.)?"*
	"Overall, which genres of games do you generally play?"
Focus 3: Content Consumption Patterns for Traditional Media Forms and Videogames	*"At any given time, I tend to be actively playing more than one **game**- i.e., I tend to play a variety of games and switch between them based on various factors"*
	*"At any given time, I tend to be actively watch more than one **television series** - i.e., I tend to watch a variety of television series and switch between them based on various factors"*
Focus 4: Determining Factors of Gaming Selectivity	*"Why do you prefer (or not prefer) to play multiple games at once?"*
	"How do you decide which game you are going to play at any given time?"
	"What is your primary motivation for switching to a different game?"
Focus 5: Mode selection in games & Experience of how mood impacts gaming decisions and in-game behaviors	*"It's important to me that games have multiple modes (single player or multiplayer, story/campaign modes vs. battle, competitive-cooperative, ranking vs. casual, etc.)"*
	"Does your mood change what you want to do in a game, or how you want to do it?"
	"Thinking of your recent gaming experiences, provide two examples of how your mood influences how you play, or explain why it doesn't."
Focus 6: Coping with negative emotions in game and EGA adaptation	*"When frustrated, upset, or bored during gameplay, I...", (5-point Likert scale)*
	["Endure it", "Stop Gaming", "Switch to a different playstyle or focus on other tasks in the game", "Switch to a different game mode or difficulty setting", "Switch to a different game", "Use an extraneous game advantage (e.g. cheat codes, walkthroughs, game mods, loopholes/exploits)"]
	"How often have you used an extraneous game advantage (e.g. cheat codes, walkthroughs, game mods, loopholes/exploits) to alter gameplay to suit your preferred playstyle(s)?"

3.4 Participant Sample

We recruited 200 participants using Amazon's Mechanical Turk (MTurk), a platform widely used to conduct user studies with Human Intelligence Tasks (HITs) through paid opportunities (Kittur, Chi, & Suh, 2008; Mason & Suri, 2012).

To comply with ethical guidelines, the HIT was exclusively available to adult workers in USA who were older than 18. In addition, only workers with at least 90% approval rate and 500 or more approved HITs were offered the task to afford greater quality control, and we measured the time participants spent per questionnaire to verify participants' attentiveness.

As gender difference has been highlighted as an important factor in selective exposure (Dittmar, 1994; Helregel & Weaver, 1989; Meadowcroft & Zillmann, 1987; Potts & Sanchez, 1994), we endeavored to ensure that we had an adequate sample of female participants, whom are often underrepresented in games user research.

Participants were aware that their identities would remain confidential and that no deception was involved in the task. Participants were paid $4.00USD as compensation for completion of the 20-minute survey.

Participant responses (n = 200) were assessed using exclusion criteria, reducing the total sample used in analysis (n = 194). Exclusionary criteria were applied to participants who gave one-word responses or copied text from the questions in the open-ended responses in our survey (n=6). The refined sample included 79 women and 115 men, with no participants in our sample opting for the other gender options (non-binary, prefer not to disclose). The average participant age is in-line with the age of the average videogame player (mean age = 33, SD = 7.7). The breakdown of hours spent playing games per week revealed that 45.4% played between 1 to 10 hours per week, 33% played between 11 to 20 hours per week, and 20.6% played more than 20 hours per week. 47.9% yearly household income ranged from $35,000 to $74,999; 60.8% "single, never married" and 34% "married or domestic partnership." Participants within the sample had a wide range of experience playing video games; players' preferred game genres are reported in Figure 1.

Figure 1: Game Genres Participants Play
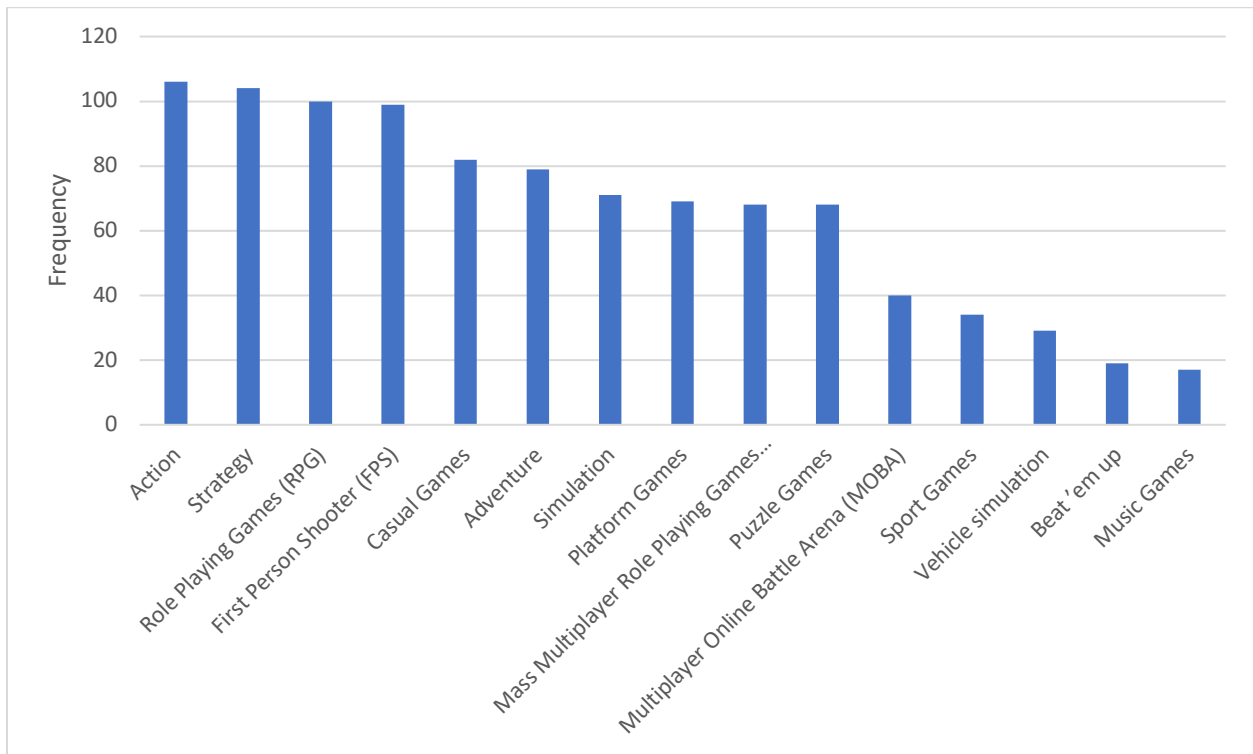
3.5 DATA ANALYSES

We conducted both qualitative and quantitative analyses on the survey data.

3.5.1 Qualitative Analyses

Thematic analysis helps researchers distinguish, analyze and understand themes identified within qualitative data (Braun & Clarke, 2006, 2016). Analysts using this method benefit from an exploratory process to identify themes within descriptive data, which could generate unanticipated findings that would otherwise be challenging to be identified using a quantitative approach. Analysis of categorical data generated through this process was conducted in SPSS 24.0 (IBM, 2017).

Open-ended questions were coded independently of other survey responses and other participant data, without a process of constant comparative analysis. Data was treated in this

manner to reduce coding biases from the thematic coder and to allow for a more robust analysis of the various codes that were applied.

Stage 1: The researcher read through all the data and responses to open-ended questions twice in order to gain familiarity with the data and to help facilitate the search for the main themes within the data set.

Stage 2: The researcher generated initial codes by reading through responses to each open-ended question individually and recording initial codes in a reflexivity journal.

Stage 3: The initial codes generated in Stage 2 were further iterated upon, refining clusters of codes into general themes.

Stage 4: Each response was examined, ensuring the conformity of themes to each piece of data within the data set. This process further refined themes by combining homogeneous themes and splitting themes of different focuses.

Stage 5: Themes were given final analytical definition and were refined through systematic examination to establish consistent granularity.

Stage 6: Themes were then created as new variables in SPSS for quantitative analysis.

Coding reflects keywords used (in specificity and generality) to present accuracy of player description of experience and reasoning. As a result, some themes contain subthemes where more specific classification was described. In cases where participants described multiple reasons in one single response, the primary reason was chosen to represent the main theme of the response.

3.5.2 Quantitative Analyses

Quantitative analyses were conducted after data coding with thematic analysis, using participants' demographic data, Likert-scale responses and categorical data based on themes generated from participants' responses to open-ended questions. Analysis was conducted in SPSS 24.0 (IBM 2017).

3.6   RESEARCH SCOPE

This programme of research forms part of a larger body of work investigating the impact of player preferences in specific game modes. However, this thesis has been delineated from the broader research project.

3.7   ETHICAL STATEMENT

Ethical approval was obtained from the University of Saskatchewan Behavioral Research Ethics Board (see Appendix item B). Participants were asked to provide informed consent before proceeding with the study.

CHAPTER 4:   RESULTS

For the sake of consistency, we will present the results in the identical structure of survey design previously presented in Chapter 3.3. The breakdown of demographic data is presented in Chapter 3.4.

4.1 CONTENT CONSUMPTION PATTERNS ON VIDEOGAMES

4.1.1 Content Consumption Patterns of Traditional Media and Videogames

We asked participants about their consumption patterns of different media (e.g., for videogame consumption we asked "At any given time, I tend to be actively playing more than one game - i.e., I tend to play a variety of games and switch between them based on various factors"), as shown in Figure 2. The majority of participants responded that they do tend to play more than one game at a time, which is similar to TV consumption, but lies in contrast to, for example, books in which participants tend to only read one at a time.

Figure 2: At any given time, do people tend to be actively consuming more than one instance of certain media form (participants responds in a Likert scale from 1 to 7 with higher indicating greater agreement)
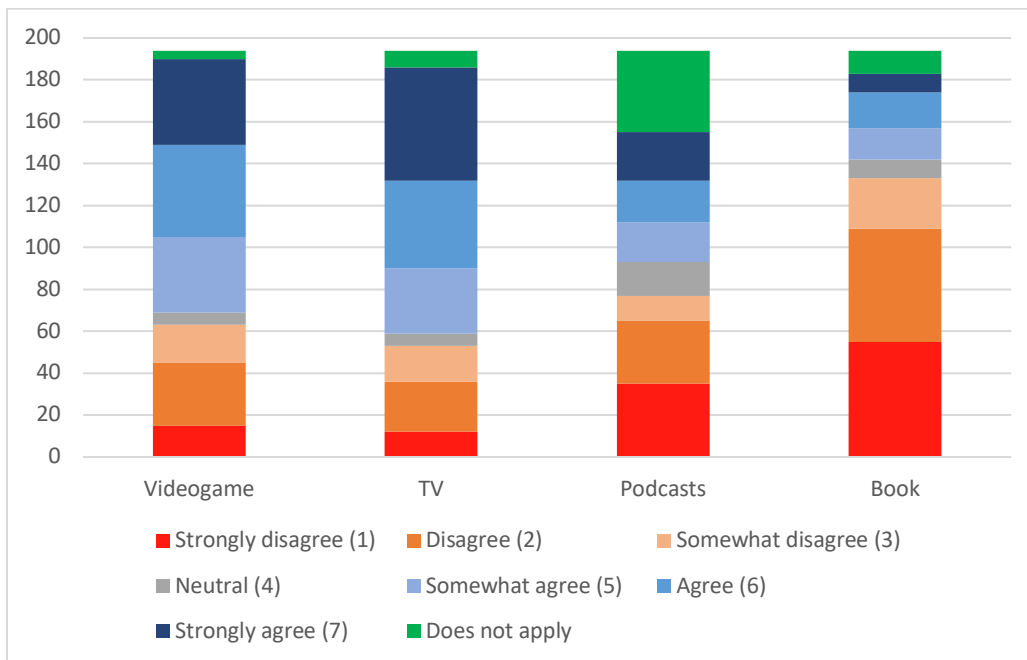
One-way ANOVA shows that participants responded differently for different media consumption (p<0.0001), as shown in Table 2. Pairwise comparison (alpha=0.05) shows significant difference between each media platform except for videogame and TV, as shown in Table 3.

Table 2: Means and Standard Deviations for Content consumption patterns of traditional media and videogames (higher mean indicating greater agreement)

	Videogame	TV	Podcast	Book
Mean (Std. Deviation)	4.65 (2.022)	4.95 (1.999)	3.68 (2.188)	2.79 (1.864)
N (excluded cases of "Does not apply")	190	186	155	183

Table 3: Post-hoc test on comparison between different media forms

Tukey HSD Post-hoc Test (alpha=0.05)			
Pair	Diff	CI	p
Videogame vs TV	0.3000	-0.2349 to 0.8349	0.4725
Videogame vs Podcast	-0.9700	-1.5313 to -0.4087	0.0001
Videogame vs Book	-1.8600	-2.3971 to -1.3229	<0.0001
TV vs Podcast	-1.8340	-1.8340 to -0.7060	<0.0001
TV vs Book	-2.7000	-2.7000 to -1.6200	<0.0001
Podcast vs Book	-1.4561	-1.4561 to -0.3239	0.0003

We further compare media consumption patterns between players only play one game at a time and players who actively play multiple games, as shown in Table 4 (grouping is based on

their responses in section 4.2.3). T-test shows significant differences between the content consumption pattern of single-game players and multiple-game players on videogame, TV and podcast, but not on books.

Table 4: Comparison between single-game players and multiple-game players on media consumption patterns (after excluding the cases of "Does not apply"; higher mean indicating greater agreement)

Media	Single game players		Multiple game players	
	Mean (Std. Deviation)	N	Mean (Std. Deviation)	N
Videogame	2.79 **** (1.594)	71	5.76**** (1.306)	119
TV	4.07**** (2.087)	70	5.47**** (1.752)	116
Podcast	3.20** (2.172)	59	3.98** (2.157)	96
Book	2.75 (2.068)	69	2.82 (1.737)	114

(****$p<0.0001$, **$p<0.05$)

4.1.2 Primary game

Further we asked participants whether they tend to have one dominant game that they play more than others if they play multiple games, as shown in Table 5. 75.7% of the participants tend to have a primary game on which they spend the majority of their gaming.

Table 5: Responses to "Do players have a primary game?" (participants response in a Likert scale from 1 to 7 with higher indicating greater agreement)

	Frequency	Percentage
Strongly disagree (1)	3	1.5
Disagree (2)	10	5.2
Somewhat disagree (3)	6	3.1
Neutral (4)	5	2.6

Somewhat agree (5)	28	14.4
Agree (6)	65	33.5
Strongly agree (7)	54	27.8
Does not apply	23	11.9
-	194	100

We further compared responses between single-game players and multiple-game players (grouping is based on their responses in section 4.2.3), as shown in Table 6. T-test analysis shows no significant difference between single-game players and multiple-game players on having a primary game.

Table 6: Comparison between single-game players and multiple-game players (after excluded 23 cases of "Does not apply"; higher mean indicating greater agreement)

	Single-game players (N=53)	Multiple-game players (N=118)	All (N=171)	t (between SG and MG)	p
Mean (Std. Deviation)	5.43 (1.647)	5.77 (1.392)	5.67 (1.479)	1.3939	0.1652

4.2 DETERMINING FACTORS OF GAMING SELECTIVITY

4.2.1 Reasons for multiple games

In terms of the reasons why participants play multiple games or play only one game in the same period of time, we asked an open-ended question "Why do you prefer (or not prefer) to play multiple games at once?" and we use thematic analysis to summarize the themes.

For further analysis, participants who chose to answer why they prefer to play multiple games were labeled "multi-games player", those who chose to answer why they prefer to play only one game were labeled "only-one-game player".

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Four themes were identified in participants' responses for why they play multiple games during the same period of time. The most prominent theme is **"Mood"**, accounting for 43.9% among players who play multiple games. Subthemes include **"Avoiding boredom"** *("If I get bored with one game I can switch to another[p19]", "It gives me variety of games to choose from when one game starts to get repetitive. [p30]"),* **"Tailoring experience to different 'Mood'"** *("I'm in the mood for different types of games at different times. [p121]", "I like doing different type tasks depending on what mood I'm in. I might feel like an RPG like Skyrim at one point or a platformer like Super Mario Odyssey for another mood. [p149]", "They stimulate me in different ways. Sometimes you get bored of fast paced action and you need something more relaxing. [p79]"),* **"Avoiding frustration"** *("Because sometimes I will get stuck on one figuring out my next move. By playing another game or 2 for a while, I can often go back to the original game and the answer comes to me and I can continue. A break helps me think clearly and figure things out [p10].", "I prefer to switch it up sometimes because then I can get some excitement and help me from not getting so angry when not winning. I still prefer one game most times but I switch a lot too. [p120]"),* and "**Mood (unspecified)**" *("Depending on my mood or how much time I have [p98]", "I like to have a variety depending on the mood I'm in and the amount of time I have to devote to the game. [p110]").*

   "Variety" (33%) is another popular consideration, subthemes include **"Variety: For 'fun'"***("I like to play more than one game at a time, occasionally, in order to spice up my interest. It's difficult to dedicate to just one game, and a breath of fresh air is always appreciated. [p8]"),* **"Variety on genre/type"** *("I usually stick to 2 games. One would always be sports came, such as FIFA, and the other one could be anything such as COD, Assassin's Creed etc. I find that I enjoy video games but I cannot have multiple games because it will take away more of my time, and I have other things to do." [p47]),* and **"Variety on experience/satisfaction"** *("I like to have a game I play competitively as well as games I play to relax. [p7]", "I like having a variety of games that give me satisfaction on different levels [p115]", "It allows me to choose to interact with a story based on how I feel while I'm gaming. Some days I want to be Batman, other days I just want to fish. [p73]").*

   For 13.2% of the cases **"Avoiding burnout on game"** is the motive behind playing multiple games (*"I play multiple games to take a break from a game and/or increase it's*

longevity of enjoyment.[p18]", "If I play the same game forever I will get burned out and stop playing it altogether. I enjoy playing a game for a little while and then switching to something different. [p93]").

   "Affordance" (9.9%) is the other theme where players are concerned about "**Time/location constraints**" (*"I can't have my Nintendo switch on me all the time so I also play mobile games on my phone [p1]", "I will often indulge in multiple games depending on the time available, say during lunch break I try not to get too into my games where I don't want to go back to work. [p123]"*) and **"Socializing"** "I have a game I play on my own time, and games I play with my friends and partner[p146]"). Table 7 and Figure 3 show the frequency of each theme and subtheme.

Table 7: Frequency of Themes Identified on Responses to "Why do you prefer to play multiple games at once?"

Theme	Theme percentage	Subtheme	Subtheme frequency	Subtheme percentage
Mood	43.9%	Avoiding boredom	30	24.8%
		Tailoring experience to different "Mood"	15	12.4%
		Avoiding frustration	7	5.8%
		Mood (unspecified)	2	1.7%
Variety	33%	Variety: For "fun"	14	11.6%
		Variety on genre/type	13	10.7%
		Variety on experience/satisfaction	12	9.9%
Avoiding burnout on game	13.2%	-	16	13.2%
Affordance	9.9%	Time/location constraints	7	5.8%
		Socializing	5	4.1%
Total	100%	-	121	100%

4.2.2 Reasons for single game

Likewise, we coded three themes in the reasons why some players chose to only play one game, with "**Individual focus on one game**" being the most prevalent theme in responses, accounting for 84.9%, including four subthemes: **"Focus on one game"** (*"I like to focus on one thing at a time, generally. I usually play a game until I've finished it before switching to the next one. [p66]", "I prefer to not play multiple games at once because I get really absorbed in the single game being played and can't juggle multiple. [p81]"*), **"Completion"** (*"I like to have complete concentration on the game I'm playing, if not I won't be any good. [p32]", "I tend to want to see a game to completion before starting another. [p31]", "i prefer not to play multiple games at once because i will forget where i left more easily. [p37]"*), **"Acquiring mastery"** (*"I like to devote my time getting as good at the one game as possible. [p14]", "I prefer not to play multiple games at once because i would rather get really good at one game. I like climbing up the ladders and if i keep playing other games, that would be hard. [p29]"*), and

"Enjoyment/obsession on one game" (*"I get obsessed with one game and I don't think about the others as I'm playing the one that I'm working my way through. [p23]", "If it's an RPG that I'm currently maining, I don't want to get the stories mixed up, otherwise I just don't think dividing up my time is for the greater good of the game experience. [p41]"*).

There were 5 cases of single-game players reporting **"Preference"** as their reasons of playing one game, subthemes include **"Preference (unspecified)"** (*"its like reading a book. one at a time is best [p160]", "I dont prefer to play multiple games because i have a very short attention span. [p164]"*) and **"Personality"** (*"I don't really like multi-tasking in general, including with games. [p112]"*).

The other theme that takes up 8.2% of the responses is **"Affordance"**, including two subthemes: **"Time constraints"** (*"I don't have a lot of time to play these days, so I tend to stick to one game. [p77]"*) and **"Socializing"** (*"I focus on one game mostly because most of my friend group plays the same game. When I game I usually play with my friends [p119]"*). Table 8 and Figure 4 show the frequency of each theme and subtheme.

Table 8: Frequency of Themes Identified on Responses of Reasons For Playing Only One Game

Theme	Theme percentage	Subtheme	Subtheme frequency	Subtheme percentage
Individual Focus on One Game	84.9%	Focus on one game	22	30.1%
		Completion	16	21.9%
		Acquiring mastery	14	19.1%
		Enjoyment/obsession on one game	10	13.7%
Preference	6.9%	Preference (unspecified)	3	4.1%
		Personality	2	2.7%
Affordance	8.2%	Time constraints	5	6.8%
		Socializing	1	1.4%
Total	100%	-	73	100%
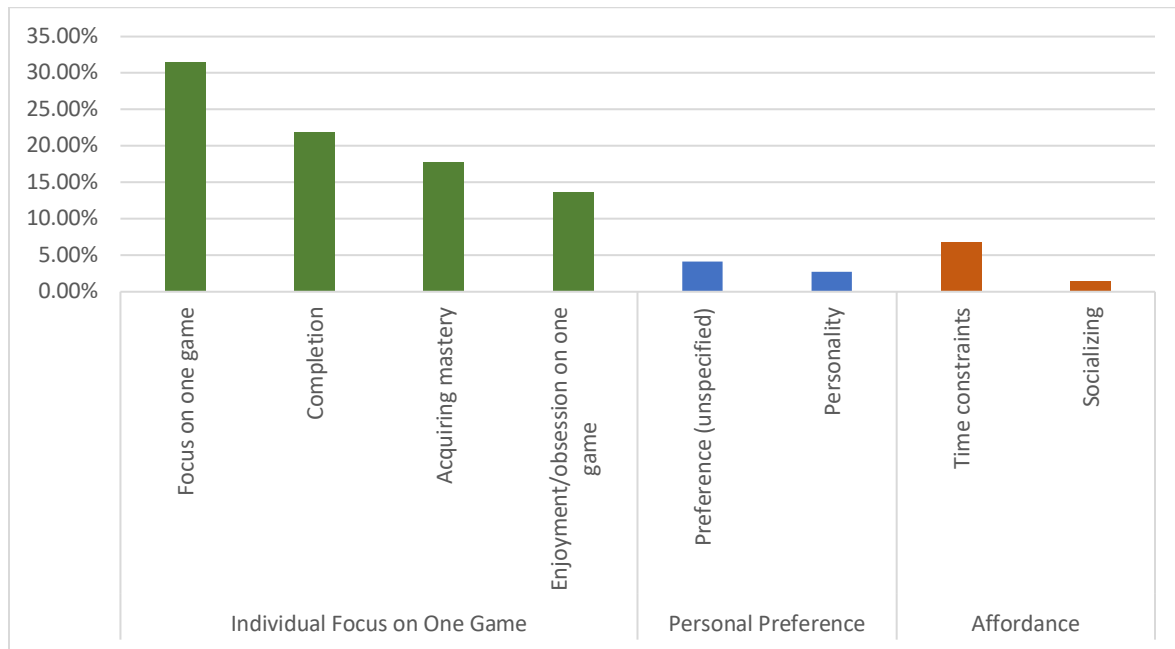
4.2.3 Determinants of game selection

We asked participants open-ended questions about the determinants of their decision making on game selection *"How do you decide which game you are going to play at any given time?"*.

Six themes are identified in thematic analysis. **"Mood"** is the most common theme which accounts for 47.9% of the responses, subthemes include **"Feeling"** (*"I just wing it, i don't plan it at all [p36]"*, *"It depends whatever I feel like playing. How adventures vs the crave for online multiplayer competition (FIFA, COD, etc). [p47]"*, *"I think about what I feel like playing at the moment. Sometimes I want to keep my mind off of things and so I play a thinking game. Othertimes I want to play a mindless game. [p49]"*) and **"Tailoring experience to different 'Mood'"** (*"If I'm in a chill mood I will play something more casual or puzzle-ish. If i'm feeling more energized I will choose something with more action, normally FPS games [p41]"*, *"I have my favorites and I rotate between some of them. Right before bed I tend to play a spider puzzle game cuz it helps to relax me and get me to sleep. At the moment I'm in a Zelda game and I have to force myself to quit after an hour or so each evening.[p23]"*, *"I choose depending on how I'm*

feeling at the time and which friends are willing to play with me at the time. If I'm in a poor mood, I may focus on a single-player casual game instead of an online multiplayer game. The same goes for if I'm feeling capable of performing well in an online competitive game. [p35]"). Unless more specific details were provided, a simple response of "depends on which game I'm [in the mood for]", "go by my gut" and "wing it" are classified as "feeling" instead of "**Tailoring experience to different 'Mood'**"; however, "depends on my mood" is classified as "**Tailoring experience to different 'Mood'**". The line between these two themes is blurry as the unconscious mind influences one person's thought processes, emotions, motivation and memory, one is not fully and always consciously aware of one's decision, especially when it comes to "spur of the moment".

21.6% of the responses relate to **"Affordance"**, which consists of three subthemes: **"Time/location constraints"** (*"how much free time I have to devote to the game. [p1]", "I think it's just depends on the situation. If I don't have much time available to play, I'll usually play more casual games that don't require too much attention or time. But, if I know I have a large block of free time available, I tend to play multiplayer games with friends especially since I have enough time to dedicate to that particular game. I would have to say that my available time plays a big role in the type of game I choose to play." [p33]*), **"Socializing"** (*"Usually what my friends are playing do I can join them. [p19]", "depends on who i'm playing with or what time of day it is. [p28]", "It depends a lot on who I'm with or what we're doing - I tend to play completely different games when I play by myself vs with a party or small group of people. It also depends on how much attention I can give a game at that time. [p82]"*), **"Energy"** (*"Depending on how much focus and energy I have to dedicate to what I'm playing. [p6]"*).

19.6% of the responses are associated with **"Preference"**, including subthemes **"Recommendation from others"** (*"By asking friends and reading reviews if I have not played the game before. [p38]"*), **"The new one"** (*"I don't have a particular system. I just choose available titles that I have not played before. [p92]"*) and **"Play only one game"** (*"I typically play a game for months and months exclusively. [p31]"*).

13.4% of the participants choose their game selection based on **"Intrinsic Motivation"**, subthemes include **"Interest"** (*"Whichever one interests me at the time. [p51]"*) and "Enjoyment" (*"I just play whichever game gives me the most joy. [p29]"*).

"Habit" is associated with 8.2% of the responses, subthemes **"The one recently playing"** (*"whatever I am currently playing on or wanting to advance in. [p71]"*) and **"The one winning at"** (*"I usually play the one that I am doing best at or winning. I like to feel like I am winning and doing well. [p20]"*).

The rest 2.5% of the responses are identified **as "Game Features"**, including themes of **"Popularity of the game"** (*"Whatever is most popular. [p52]"*) and **"Game event"** (*"If there are certain goals I want to achieve or events that are going on. [p9]"*).

Table 9 and Figure 5 show the frequency of each theme and subtheme.

Table 9: Frequency of Themes Identified on Determinants of Game Selection

Theme	Theme percentage	Subtheme	Subtheme frequency	Subtheme percentage
Mood	47.9%	Feeling	58	29.9%
		Tailoring experience to different "Mood"	35	18%
Affordance	21.6%	Time/location constraints	24	12.4%
		Socializing	15	7.7%
		Energy	3	1.5%
Preference	19.6%	Recommendation from others	4	2.1%
		The new one	6	3.1%
		Play only one game	2	1.0%
Intrinsic Motivation	13.4%	Interest	17	8.8%
		Enjoyment	9	4.6%
Habit	8.2%	The one recently playing	15	7.7%
		The one winning at	1	0.5%
Game Features	2.5%	Popularity of the game	3	1.5%
		Game event	2	1.0%
Total	100%	-	194	100%

Figure 5: Frequency of Themes Identified on Determinants of Game Selection
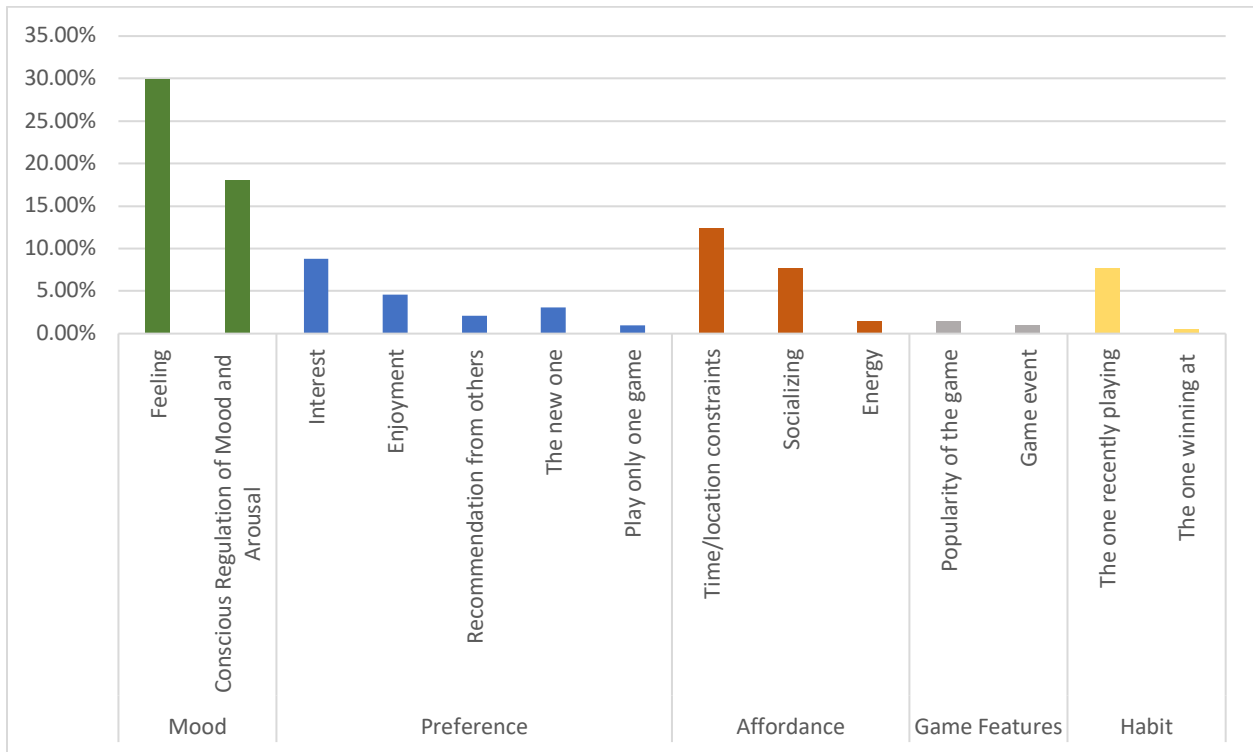
We further compare the difference between multiple-game players and single-game players for determinants of game selection, as shown in Table 10 and Figure 6.

Table 10: Comparison Between Single-game Players and Multiple-game Players on Determinants of Game Selection

	Multiple-game players		Single-game players	
Theme	Frequency	Percent	Frequency	Percent
Mood	66	54.5	27	37
Preference	12	9.9	26	35.6
Affordance	35	28.9	7	9.6
Game Features	3	2.5	2	2.7
Habits	5	4.1	11	15.1

39
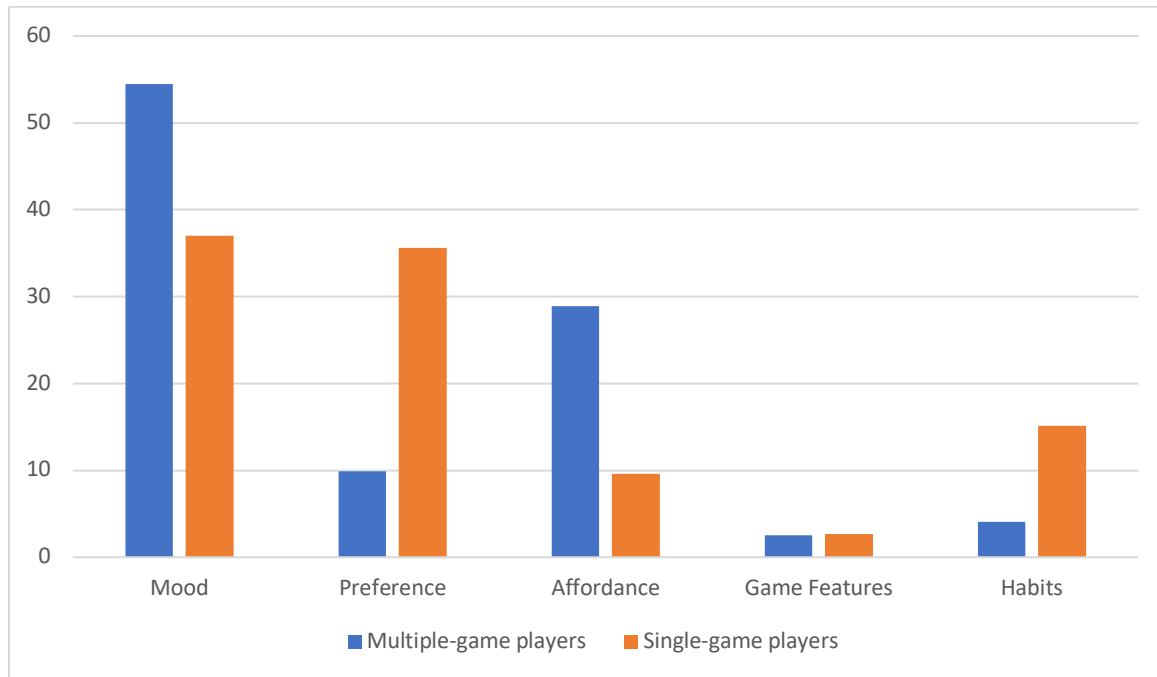
4.2.4 Determinants of game switching

Likewise, we asked the participants "What is your primary motivation for switching to a different game?". Results of thematic analysis show seven themes on determinants of game switching, among which **"Mood"** is the most common theme, accounting for 62.7% of the responses. The rest of the responses scattered on six themes: **"Completion"** (*"I switch when I've got a sense of finality from the other game either from completing it or running out of new ideas for how to approach it.[p31]"*, *"Only after finishing a game will I think about moving onto a different one. If the game I'm playing isn't what I expected or is too boring to play I will also drop it and switch to a different game. I don't like playing multiple games at one time.[p53]"*), **"Newer game"** (*"Usually if I've been missing a game, or if there is a new game I am interested in[p58]"*), **"Variety on experience/satisfaction"** (*"Switch up the kind of experience I'm having. I try to do it before I get sick of a game. [p54]"*, *"My primary motivation is to get a different experience. Maybe it has different mechanics, or is a different genre.[p134]"*, *"My primary motivation for switching to a different game is for reasons of variety.[p148]"*), **"Avoiding burnout on game"** (*"To give the current game a break so I don't get burnt out on it.[p18]"*),

"Affordance" and **"Stuck on progress"** (*"I tend to want to switch to a different game when I get hung up or stuck on something in a game. I want to avoid being frustrated.[p24]"*).

Three subthemes of **"Mood"** were included: **"Avoiding boredom"** (*"Boredom with the one that I'm playing. If I like what I'm playing and I'm engaged, then I'll stay with it. If it loses my interest, I'll switch.", "so I don't get bored playing the first game [p2]", "Finishing one, of course. Playing enough to be happy with it again. Complete a campaign.[[p146]"*), **"Tailoring experience to different 'Mood'"** (*"I'll switch to less intense games if I need to rest my brain or if I've had an exceptionally hard day. [p85]", "To suit my mood or tastes at the moment.[p101]", "Wanting to relax or wanting to be competitive, either of those two[p161]"*) and **"Avoiding frustration"** (*"If i get upset enough that I am no longer having fun playing one game but still want to enjoy gaming I may switch game.[p7]"*).

There are two subthemes distinguished under "**Affordance**": **"Socializing"** (*"My mood or if family is over. My Grandson brings his switch games and we play Mario as a family with 4 players.[p23]", "which friends are online, did we make plans to game at a certain time.[p28]"*) and **"Time/location constraints"** (*"lot of thought or attention given to it while I like to play my action games at home when work is not on my mind because I have more time to focus my energy and time on the action games.[p11]"*).

Table 11 and Figure 7 show the frequency of each theme and subtheme.

Table 11: Comparison Between Single-game Players and Multiple-game Players on Determinants of Game Switching

Theme	Theme percentage	Subtheme	Frequency	Subtheme percentage
Mood	62.7%	Avoiding boredom	93	48%
		Tailoring experience to different "Mood"	18	9%
		Avoiding frustration	11	5.7%
Completion	11.9%	-	23	-
Newer game	5.7%	-	11	-
Variety on experience/satisfaction	5.7%	-	11	-
Avoiding burnout on game	5.2%	-	10	-
Affordance	5.1%	Socializing	9	4.6%
		Time/location constraints	1	0.5%
Stuck on progress	3.6%	-	7	-
Total	100%	-	194	-
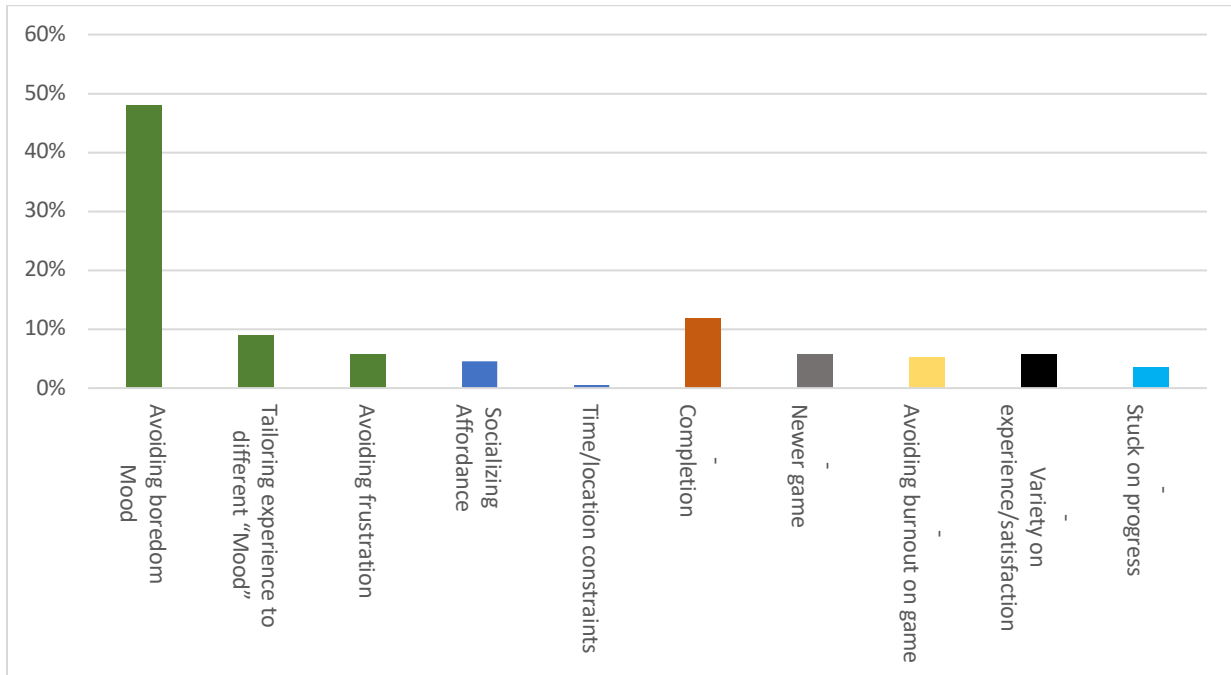
4.3 MODE SELECTION IN GAMES & EXPERIENCE OF HOW MOOD IMPACTS GAMING DECISIONS AND IN-GAME BEHAVIORS

4.3.1 Importance of game mode

We asked participants about their perception of the importance of having different game modes in the games "It's important to me that games have multiple modes (single player or multiplayer, story/campaign modes or battle mode, competitive or cooperative, ranking or casual, etc.)" provided with a 7-likert (from 1 ("Strongly disagree") to 7 ("Strongly agree")) scale with one additional option of "Does not apply", as shown in Table 12.

Table 12: Importance of Game Mode (7-point Likert-scale, higher indicating greater agreement)

	SG		MG		All	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree (1)	2	2.7	3	2.5	5	2.6
Disagree (2)	12	16.4	10	8.3	22	11.3
Somewhat disagree (3)	16	21.9	12	9.9	28	14.4
Neutral (4)	11	15.1	11	9.1	22	11.3
Somewhat agree (5)	13	17.8	26	21.5	39	20.1
Agree (6)	9	12.3	27	22.3	36	18.6
Strongly agree (7)	10	13.7	31	25.6	41	21.1
Does not apply	0	0	1	0.8	1	0.5
Total	73	100	121	100	194	100

Table 13: Comparison Between Single-game Players And Multiple-game Players on Importance of Game Mode (after excluding 1 case of "Does not apply", higher mean indicating greater agreement)

	Single-game players	Multiple-game players	All	t (between SG and MG)	p
Mean (Std. Deviation)	4.21 (1.74)	5.1 (1.707)	4.78 (1.78)	3.487	0.0006

T-test analysis shows multiple-game players consider game modes important significantly more than single-game players, as shown in Table 13.

4.4 MOOD AND IN-GAME DECISIONS

To further investigate what different decisions players make in the gameplay to adjust their play experience to achieve mood repair, we asked players about their perception of how much their mood has an impact on their in-game decisions and vice versa. We then asked about their experience of how mood influenced the way they play.

4.4.1 Does mood change in-game behavior and vice versa?

We asked the players about how their mood and in-game behaviors impact each other ("Does your mood change what you want to do in a game, or how you want to do it?", "Does what you do in a game change your mood?", "Other than your performance, does your mood influence the way you play a game?") provided with 5-likert scale ("Always", "Frequently", "Occasionally", "Rarely", "Never"), as shown in Table 14 and Figure 8.

Table 14: Does Mood Change In-game Behavior and Vice Versa? (participants response in a Likert scale from 1 to 5 with higher indicating lower frequency)

	Does your mood change what you want to do in a game, or how you want to do it?	Does what you do in a game change your mood?	Other than your performance, does your mood influence the way you play a game?
Always (1)	13	9	14
Frequently (2)	52	40	45
Occasionally (3)	89	85	85
Rarely (4)	27	46	35
Never (5)	13	14	15
Total	194	194	194
Minimum	1		
Maximum	5		
Mean	2.87	3.08	2.96
Std. Deviation	0.965	0.957	1.007

Figure 8: Does Mood Change In-game Behavior and Vice Versa? (participants response in a Likert scale from 1 to 5 with higher indicating lower frequency)
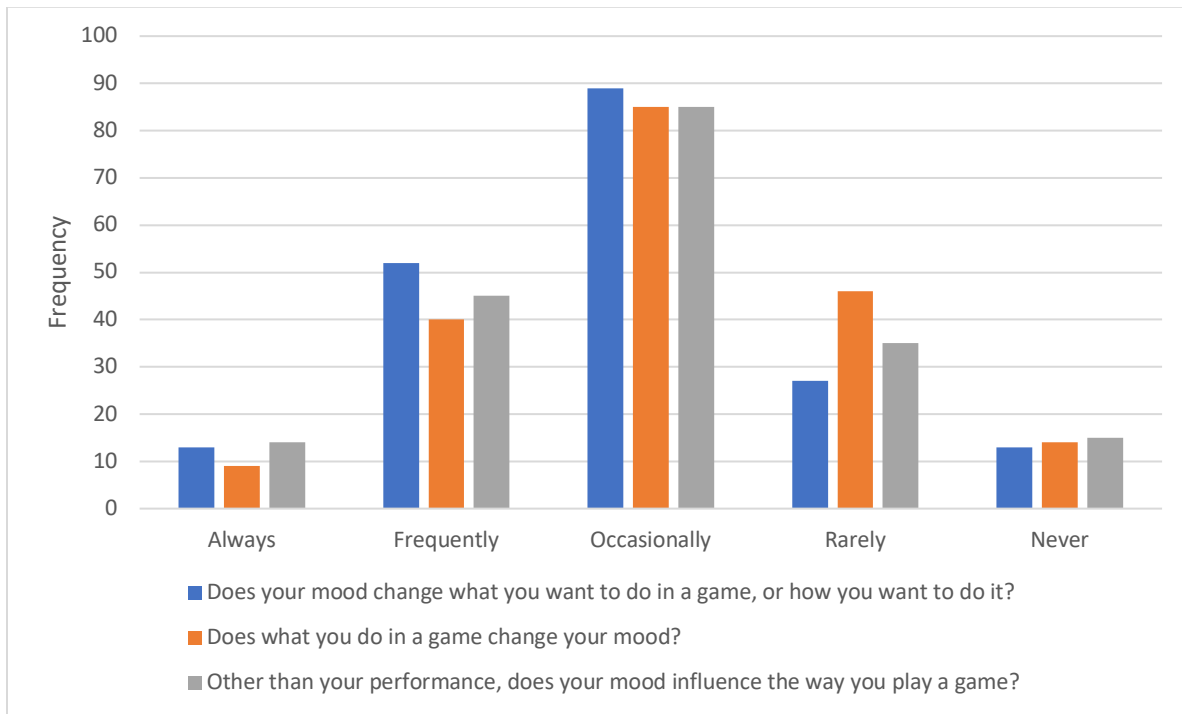
T-tests show significant difference between single game players and multiple game players on "Does your mood change what you want to do in a game, or how you want to do it?", but no significant difference was found on the responses to other two questions (see Table 15).

Table 15: Comparison Between Single-game Players and Multiple-game Players on "Does mood change in-game behavior and vice versa?" (higher mean indicating lower frequency)

Single game players Mean (Std. Deviation)	Multiple game players Mean (Std. Deviation)	t	p
Does your mood change what you want to do in a game, or how you want to do it?			
3.11 (0.906)	2.73 (0.975)	2.6999	0.0076
Does what you do in a game change your mood?			
3.22 (1.003)	3 (0.922)	1.5574	0.121
Other than your performance, does your mood influence the way you play a game?			
3.08 (1.01)	2.88 (1.002)	1.3428	0.1809

4.4.2 Thematic analyses on how mood changes the way players play

Players were prompted to "Think of your recent gaming experiences, provide two examples of how your mood influences how you play, or explain why it doesn't.", provided with a text-field.

Five themes about the effects between their mood & experience and their in-game decisions and behaviors were constructed through the thematic analysis process, as they appeared repeatedly among players' description of their experience in the first round of coding. These themes exhibit various interrelating factors of gameplay experience under the effect of mood: game selection, game mode, playstyle and performance, which conversely also contribute as influential input factors to players' post-game affective mood state. These themes are shown in the rest of this section with example responses provided.

(1) Game mode used for mood

17 participants (8.8%) explicitly associated their mood and game mode, with 13 participants indicating that mood was the direct determinant of their game mode choice.

"The other day I was feeling rather down so I played something a bit more chill and not so harsh like PoE. I find that if I'm already feeling a bit negative playing something chill can give me a good feeling. [p153]"

While the other 4 responses pointed out mood didn't play a role in their gameplay decision.

"I don't think my mood affects my way of playing, it's mostly if I'm in the mood to play or not. If I'm the mood to play I'll play, but that doesn't necessarily create a character out of me. Although, a game CAN put me in a mood if I'm performing badly. [p47]"

(2) Game Selection

Among 48 participants (24.7% of all participants) mentioned the relation between mood and game selection, 40 said that they made their game choice at the moment based on their mood.

"I get aggressive and need to take out my anger so I play a fighting game, or I'm relaxed so I play Minecraft before I go to sleep, or I want to challenge my mental abilities so I play a strategy game [p69]"

"if I am feeling energetic like after exercising I will play an action-packed game like a shooter; if I just want to relax after a hard work day, I will typically play a story-based game like an RPG [p25]"

3 cases stated that their mood didn't account for their game selection decision.

"I suppose if I was angry AND I played first person shooter, then I would play first person shooter. But I don't play FPS. I mostly play strategy games and some with minigame components with things similar to Candy Crush. Since my games as largely the same, my mood doesn't usually enter into the decision.[p142]"

A subtheme here referred to the decision to game with negative mood (N=5).

"If I'm in a bad mood, I usually don't play games. If I do play, I tend to keep the game and whatever has me down separate. [p117]"

(3) Playstyle

46.4% (N=90) of the participants mentioned how mood impacted their playstyle in the game, out of which 86.7% (N=78) associated their chosen playstyle with their pre-game mood states.

*"When I'm **frustrated** or **mad**, I tend to play more **aggressively**/stupidly and make more mistakes. Especially at Fortnite. Sometimes when I'm in a **bad** mood, I just don't care, and get in a fight I'm not prepared for and die way too quickly. [p174]"*

*"In some games, like Metal Gear Solid, there are multiple playing styles you could employ to achieve the same goal. If I am feeling **excited** and want action in the game, I can go in guns blazing. On the other hand, if I'm feeling **mellow**, I could sneak in without shooting anyone. With puzzle games, if I am feeling like I want a challenge, I can move through the game **quickly** and methodically. On the other hand, if I am feeling mellow I can play the game **slowly** and **casually**, not worried about moving forward in the game. [p94]"*

13.3% (N=12) stated that mood didn't reflect their playstyles.

"When I play a game the goal remains the same so there is no way to change how I would play it. [p13]"

"It doesn't change how I play because usually my mood is the same when playing games I am usually determined to win. [p19]"

"I don't think my mood influences how I play games. It might make me more impatient in general but I don't think that changes how I play or strategize anything. [p88]"

"The games I play tend to be fairly straightforward, where there aren't a lot of choices of what to do in the game. So, my mood only influences whether I play or not, and not what I do in the game. [p22]"

(4) Pre-game mood state, performance and post-game mood state

22.7% (N=44) of participants noted a perceived relation between their pre-game affective state and their game performance. Among these participants, 20.5% (N=9) indicated that their mood had a positive impact on their in-game performance,

"During a recent game of call of duty, my mood was **good** *and* **relaxed***. I feel like this helped me play* **extremely well** *by allowing me to obtain deep focus and concentration while my mind was* **relaxed and free from distractions***. When my mood is good, I am able to become more* **creative** *and competitive in games. This allows me to perform my absolute best when gaming. [p30]"*

12 (27.3%) cases demonstrated the effect of negative emotions on in-game performance,

"If I'm **overwhelmed** *by my life around me I get* **stressed** *and angry if I can't focus enough to play well. [p6]"*

"If I'm playing a fighting or shooting game, I will play worse than usual if I'm feeling **down** *or* **depressed***. It will usually make me want to play a single-player mode. [p56]"*

18 (40.9%) cases showed that their mood state could influence their in-game performance in both positive and negative way,

"I was feeling really **depressed** *the other day. I thought having some game time would improve my mood, but I found I just* **performed badly** *while playing. But sometimes when I'm really* **stressed out***, I find I try harder and* **do better** *in a game then. [p12]"*

"If I'm feeling **annoyed** *or* **irritated** *maybe even* **angry** *I want to play a shooter. I can take my* **frustrations** *out in a game and I'm usually* **better** *at the shooters when I'm* **frustrated***. I get so immersed but I'm not thinking about getting killed in the game. I'm just taking out* **frustrations***. I'm usually surprised by how well I do when I'm not thinking just acting. If I'm* **low** *or* **depressed***, playing a game like a shooter doesn't work. I tend to overthink every move and make mistakes. I get* **frustrated** *and think I'm no good at the game because I'm being too* **cautious** *or* **hesitant***. [p17]"*

*"If I shaky or impatient I don't take the time to learn the skills and do the process right, so I simply die and then I get more **frustrated** and it feeds upon itself. If I'm **calm** and in a **good mood** I don't let my mistakes bother me too much and I enjoy the game more. [p23]"*

while 11.1% (N=5) explicitly expressed that their mood didn't fluctuate their gameplay performance.

"I don't think my mood influences how I play games. It might make me more impatient in general but I don't think that changes how I play or strategize anything.[p88]"

Conversely, how players performed could also alter player's mood. 20.6% (N=40) participants mentioned the correlation between their in-game performance and their post-game mood. 19 cases (47.5% of all the responses that mentioned) expressed that their performance in the game had a positive impact on their post-play mood.

"Other times if I'm playing a more casual game like Stardew Valley, if I'm sad or feeling mopey it usually calms me down and I begin to feel a bit lighter, happier. [p41]"

"If I stay calm, and if the game is going good, and my mood will be good and I would play better. [p52]"

14 cases demonstrated the negative effect of performance on their mood.

"I was playing pokemon and i could not figure out what to do which made me frustrated so i had to get some help from the internet. [p40]"

"I don't think my mood affects my way of playing, it's mostly if I'm in the mood to play or not. If I'm the mood to play I'll play, but that doesn't necessarily create a character out of me. Although, a game CAN put me in a mood if I'm performing badly. [p47]"

"It was when i was not in good mood with my partner. That anger inside of me made not to be able to concentrate and play very well. It made me lose the game and get me angrier. I also experienced over happiness that affected my mood and how I played game on that day. I was too happy and loose concentration on the game because my heart was always on what was making me happy at that moment. [p75]"

6 participants (15%) reported both positive and negative impact on mood by their performance in the game.

"If I am having a bad time with my teammates, my mood will shift negatively. It will make me stressed out to keep playing with people who are upset. Another way is when I am having a good time and my mood shifts positively and I want to play more with the same group. [p4]"

"When I am unable to win it makes me disappointed and unhappy. I tend to become annoyed at a game and move over to something else so I don't lost my temper. If I am doing really well and making much progress, such as experience or levels, I like to keep at it and keep playing since I feel like I get into a groove so to speak. [p39]"

"On one occasion, I had a very bad day at work. I was very agitated and angry from the events which occurred to me earlier in the day. I decided to try and take my mind off of work by playing video games. But, since I was still on-edge and angry, it translated in game. I was much more aggressive then I normally was. I didn't have patience and wasn't performing nearly as well as I normally would. My bad mood was causing me to play very different, and it was obvious based on my results. Instead of taking my mind off my bad mood, my game play changed dramatically because of it.   On another occasion, I was having a great day. Things were going my way and I was in a really good mood. When I played games on that day, I was very loose, relaxed, and happy. I know that I had a much better gaming experience because of my good mood. Nothing could get me down, and it translated in-game as well. I was performing better than ever, having a blast, and really enjoying myself. I gained more achievements in that one gaming session than I had all week. I'm sure that my good mood was a primary factor in my good gameplay. [p33]"

Only 1 response stated that performance didn't influence one's affective state.

"I think it really doesn't. The game itself doesn't, it's the social interaction that makes me happier. I feel not much different when I'm actually playing many games, just looking to kill time. [p105]"

4.5 COPING WITH NEGATIVE EMOTIONS IN GAMEPLAY

4.5.1 Frequencies of using different strategies to cope with negative emotions in gameplay

To determine how players utilize different strategies to cope with negative emotions in gameplay, we asked participants to rate their frequency of usage on a 5-point Likert scale, as shown in Table 16 and Figure 9.

Table 16: Frequencies of Using Different Strategies to Cope with Negative Emotions in Gameplay (participants response in a Likert scale from 1 to 5 with higher score indicating greater agreement)

Frequency	endure	stop gaming	switch playstyle	switch game mode or difficulty	switch game	EGA (cheat)
Always (1)	7	11	9	8	16	4
Frequently (2)	43	66	69	36	77	9
Occasionally (3)	91	87	75	70	59	40
Rarely (4)	45	23	29	61	31	70
Never (5)	8	7	12	19	11	71
Total	194	194	194	194	194	194

Figure 9: Frequencies of using different strategies to cope with negative emotions in gameplay
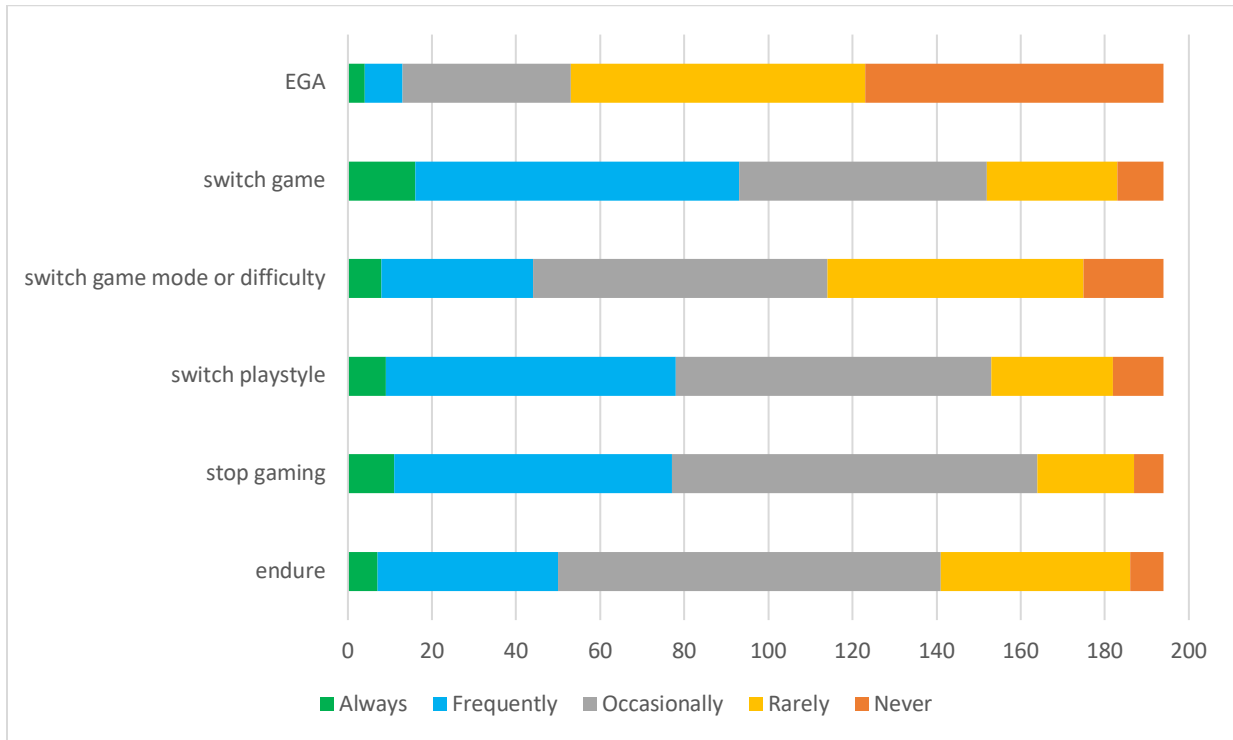
T-tests show significant differences between Single game players and Multiple game players on "Stop gaming", "Switch playstyle or tasks", "Switch game mode or difficulty" and "switch game" (see Table 17).

Single Game Players Mean (SD)	Multiple Game Players Mean (SD)	t	p
"Endure it"			
2.96 (0.807)	3.06 (0.916)	0.7697	0.4425
"Stop Gaming"			
2.92 (0.954)	2.63 (0.808)	2.2605	0.0249
"Switch to a different playstyle or focus on other tasks in the game"			
3.08 (0.997)	2.67 (0.898)	2.9546	0.0035
"Switch to a different game mode or difficulty setting"			
3.49 (0.915)	3.09 (1.025)	2.7396	0.0067
"Switch to a different game"			
3.15 (1.114)	2.45 (0.856)	4.9155	<0.0001
"Use an extraneous game advantage (e.g. cheat codes, walkthroughs, game mods, loopholes/exploits)"			
3.95 (1.092)	4.04 (0.898)	0.6227	0.5342

4.5.2 The Most Often Used Coping Strategy

Likewise, we asked participants about the one strategy that they rely on the most to cope with negative emotions in gameplay ("Of all the options in the previous question (endure it, stop gaming, switch, etc.), which one do you do the most often, and why?"), results are shown in Table 18 with a comparison between single-game players and multiple game players.

	ALL		Single Game Players		Multiple Game Players	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
switch game	58	29.9	11	15.1	47	38.8
stop playing	57	29.4	27	37	30	24.8
endure	43	22.2	21	28.8	22	18.2
switch playstyle	9	4.6	4	5.5	5	4.1
switch mode	8	4.1	1	1.4	7	5.8
play different parts of the game	6	3.1	2	2.7	4	3.3
walkthrough	4	2.1	2	2.7	2	1.7
switch media	3	1.5	0	0	2	1.7
change difficulty	3	1.5	2	2.7	1	0.8
switch to physical activity	2	1	0	0	1	0.8
cheats/ mods	1	0.5	3	4.1	0	0
Total	194	100	73	100	121	100

We take out 3 main factors ("switch game", "endure", "stop playing") that were prevalent in both groups ("mg", "oo") to see the subtle differences:

(1) "use cheats/mods" and "change difficulty" were used exclusively by single-game players.

(2) "switch media" and "switch to physical activity" were used exclusively by multiple-game players.

4.5.3 Use of EGA

To see if single-game players are more inclined to use EGA to tailor their gaming experience because they typically don't have the option of switching games, we asked participants "How often have you used an extraneous game advantage (e.g. cheat codes, walkthroughs, game mods, loopholes/exploits) to alter gameplay to suit your preferred playstyle(s)?" provided with 5-point Likert scale. Results are shown in Table 19.

Table 19: Usage of EGA with Comparison Between Single-game Players and Multiple-game Players (participants response in a Likert scale from 1 to 5 with higher indicating lower frequency)

	Single Game Players (N=73)	Multiple Game players (N=121)	All (N=194)
Always (1)	0	0	0
Frequently (2)	5	5	10
Occasionally (3)	15	15	30
Rarely (4)	28	66	94
Never (5)	25	35	60
Total	73	121	194

T-test shows no significant difference in responses between single-game players and multiple-game players (see Table 20).

Table 20: Comparison Between Single-game Players and Multiple-game Players on the Use of EGA (Mean and standard deviation, higher score indicating lower frequency)

All (N=194)	SG (N=73)	MG (N=121)	t	p-value
4.05 (0.819)	4.00 (0.913)	4.08 (0.759)	0.6582	0.5112

CHAPTER 5:   DISCUSSION

In this chapter, we discuss how the results of our work map with our research questions. We also further expand on the thematic coding, and discuss some of the implications surrounding those codes.

5.1   MOOD, GAME SELECTION AND GAME SWITCHING

The following section discusses our results in relation to RQ.1, RQ1.1, RQ1.2, & RQ1.3, framed through the context of impacts on mood. The pattern of results suggests that game selection and game switching behavior are each influenced by a motivation for mood repair in a majority of players.

Do people choose which game to play in order to facilitate mood repair?

Yes—some (but not all) people make game selections in order to facilitate mood repair. Through our thematic analysis, "Mood" was coded in 47.9% of responses as determinants for game selection (subthemes include "Feeling" and "Tailoring experience to different 'Mood'"). Some players choose which game to play based on intervention potential of the games, such that players who are seeking a relaxing experience tend to choose casual games like RPGs; and those who are seeking an energetic experience tend to choose games that are of higher task demand level, more intense and of faster pace, such as FPS or action games. This is consistent with Bowman and Tamborini's findings (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010) that increased task demand results in higher intervention potential and that people in bored affective state prefer high level of task demand, while people in stress prefer lower or moderate level of task demand.

Do people actively play a variety of games?

Over 60% of participants tend to actively play multiple games within the same general period of time, such that they will switch between games when they feel inclined to do so. In addition, 75.7% of participants reported that they tend to have one primary game that they play more of the time than other games. While this does not preclude switching games to facilitate

mood repair, it suggests that there is still a relative degree of stability and continuity in terms of game selection.

To gain further insight, we also compare players' game consumption patterns with their consumption patterns on traditional media. As shown in Table 1, the content consumption pattern of videogames is similar to TV viewing in terms of the proportions of people who consume multiple instances of content and singular content. Pairwise comparison indicates that people tend to switch content more on TV and videogame than on book or podcast.

Participants who play only one game scored significantly lower on self-reported content switching for both TV and podcast. People who play multiple games and switch between them also have a higher tendency to switch content on other media forms (see Table 4). One interpretation of this result is that some people have a lower preference for switching content regardless of content type. From this, we suspect that one distinction between single-game players and multiple-game players is their generalized media switching preference—a trait characteristic that makes an individual more likely or less likely to switch content—regardless of platform. Further supporting this, in response to the question "It is important to me that games have multiple modes", people who play multiple games agree significantly higher than single-game players. People who play a single game tend to focus solely on the specific game mode in a specific game.

If people switch between games, what is their motivation for doing so?

We explored the motivations behind why people choose to play either multiple games or just a single game in the same epoch of time. Our thematic analysis coded four themes within the responses of players who play multiple games: "Mood", "Variety", "Avoiding burnout on game" and "Affordance". In addition, the thematic analysis coded three themes for players that play one single game: "Individual focus on one game", "Preference" and "Affordance". We also asked participants about their determinants of game selection and game switching, which coded "Mood", "Affordance", "Preference" and "Intrinsic motivation" as the main determinants for

players to decide which game to play at any given moment. To give structure to the discussion, we will first address RQ1.3, and return to other motivations for switching between games.

Do people switch between videogames to facilitate mood repair?

Yes—there is evidence that people play multiple games, and switch between them to facilitate mood repair. "Mood" is the dominant theme that drives players to play multiple games (4.2.3 Reasons for multiple games), accounting for 43.9% (N=53) of our coded responses. In addition to this, "Mood" also accounts for 62.7% as determinants for game switching (subthemes include "Avoiding boredom", "Tailoring experience to different 'Mood'" and "Avoid frustration") and is the most common reason for players to play multiple games.

This provides strong evidence to support that people do switch videogames to facilitate mood repair. This result is in line with the consumption patterns seen in other studies investigating mood management and selective exposure on traditional media: media consumers in a particular mood state tend to select content that is supportive to their mood repair needs (D. R. Anderson et al., 1996; Greenwood & Long, 2009; Helregel & Weaver, 1989; Larson, 1995; Meadowcroft & Zillmann, 1987; Moskalenko & Heine, 2003). As with other forms of media, video games also have a varying degree of message-behavioral affinity and hedonic valence (Y.-S. Chen & Raney, 2009). Players may intuitively understand these differences, and depending on the genre, pace, mechanic, storytelling, etc., they may select a game that is more likely to promote their desired level of arousal or stimulate different valences (e.g., excitement or relaxation) for the players. Having multiple games available allows players to choose to play a game that has higher message-behavioral affinity and a more positive hedonic valence to the player's current mood state. In effect, having multiple games affords players with a greater variety of options, and allows them to choose a game that is more supportive of their mood repair needs.

5.2 OTHER MOTIVATIONS FOR SELECTING AND SWITCHING

To more fully address RQ1.2 (If people switch between games, what is their motivation for doing so?), this section will provide detail into other motivational themes that were coded.

Theme: Affordance

"Affordance" was coded in both reasons for playing multiple games (9.9%) and reasons for playing one single game (8.2%), which includes "Time/location constraints" and "Socializing". However, these two subthemes drive players to different gaming behaviors in two different contexts.

For multiple game players, "Time/location constraints" means that they choose different games to play according to their time available for the present play session or the gaming devices they have access to at the given moment. For example, if they have a two-hour time slot available to play games, they tend to choose the games that support longer play sessions, such as an RPG. In contrast, when they only have 30 minutes or less available, they tend to choose the games that support shorter play sessions, such as mobile casual games. If players are commuting or otherwise in-transit, only mobile devices are available—increasing their transient affordance—and the probability that they will be used to play games. But for people who focus on playing a single game, "Time constraints" means that their gaming time is limited so they choose to devote all the gaming time into the one game which they want to play the most.

People who primarily play videogames to socialize with their friends often switch between playing either multiple games or one single game, depending on the number of games that their friends' play. When most of an individual's friends play the same game, these players tend to focus on playing the group selected game. However, when the individual plays with different friend groups, it's more likely that they would play multiple different games. This gaming behavior may have some interesting implications for mood management theory, as the choice of media selection becomes a group facilitated selection rather than an individual's selection. There is limited understanding of how groups making media selections may impact upon mood management theory, and mood repair more generally.

Theme: Intrinsic Motivation

13.4% of participants responses were coded as "Intrinsic Motivation" (subtheme includes "interest" and "enjoyment") as a determinant for game selection. "Enjoyment" also appears as one of the reasons some players choose to play exclusively one game in the same period of time. Of note, the Intrinsic Motivation Inventory (IMI), which is widely used within games research,

uses "interest" and "enjoyment" as the primary subjective measure for intrinsic motivation. This is consistent with Ryan's finding (Ryan et al., 2006) on psychological need satisfaction as gaming motivation. Although the focus of this thesis is primarily on mood management using videogames, it's worth noting that playing for mood repair and emotion regulation isn't the only psychologically-beneficial motivation for players to engage in virtual worlds. Satisfaction of psychological needs (in the context of Self-determination Theory: competence, autonomy and relatedness) is also an important aspect of player motivation and enjoyment.

Theme: Variety & Avoiding Burnout

"Variety" was coded as a theme and represents 33% of the responses as one of the reasons for players to play multiple games in the same period of time, and 5.7% of determinants of game switching.

In the context of mood management theory, playing a variety of games and having them available to choose from could be considered as a way of actively arranging media stimuli so that the player would be able to expose oneself to the game with higher affinity (which might stems from certain elements in the gameplay) to one's current mood state, to promote positive mood and alleviate negative mood. Although the mood management perspective might not be the only reason behind this theme.

"I like to have a game I play competitively as well as games I play to relax."

"It allows me to choose to interact with a story based on how I feel while I'm gaming. Some days I want to be Batman, other days I just want to fish."

"They stimulate me in different ways. Sometimes you get bored of fast paced action and you need something more relaxing."

Similarly, "Avoiding burnout on game" also appears on both reasons for playing multiple games (13.2%) and determinants of game switching (5.2%). When a player plays the same game over and over again for a long period of time, the player is likely to build up tolerance for the same stimulation which could lead to boredom and fatigue.

"I play multiple games to take a break from a game and/or increase it's longevity of enjoyment."

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"If I play the same game forever I will get burned out and stop playing it altogether. I enjoy playing a game for a little while and then switching to something different."

5.3 CONTENT SWITCHING WITHIN GAME

The following section explores content switching within games with a focus on exploring mood repair outcomes.

Do people switch game modes or adjust in-game choices for mood repair?

To answer RQ2, we asked participants to "Think of your recent gaming experiences, provide two examples of how your mood influences how you play, or explain why it doesn't.". Thematic analysis of the responses suggests that while a few participants report that pre-game mood state doesn't change the way they play and strategize in the game, pre-game mood state influences how most of them play in the given gaming session, specifically influencing their decisions on game selection, game mode selection and playstyle, leading to an impact on performance and post-game mood. These decisions reflect their pre-game mood states and facilitate mood repair.

When different game modes are available, do people choose different modes for mood repair?

To avoid biasing participants, we didn't explicitly ask participants if they switch game modes to facilitate mood repair. However, we gained some insight on this by asking about their perception of the importance of the availability of different game modes. As shown in 4.3.3 (importance of game mode), about 60% (N=116) of the participants agree that it's important to have different game modes in the games.

Moreover, multiple-game players consider the availability of different game modes important significantly more than single-game players (p=0.0006). One possible interpretation would be the dominant theme of "Individual focus on one game" in responses to reason for playing only one game in a period by single-game players. Single-game players don't care much about variety, but more about acquiring mastery, completion of the game and the feeling of achievement in gameplay.

What other adjustments in gameplay do players make based on their current mood state?

We asked participants to "Think of your recent gaming experiences, provide two examples of how your mood influences how you play, or explain why it doesn't." Thematic analysis of the responses reveals that while a few participants report that pre-game mood state doesn't change the way they play and strategize in the game, pre-game mood state influences how most participants play in a given gaming session, specifically influencing their decisions on game selection, game mode selection and playstyle. This in turn leads to an impact on performance and post-game mood. These decisions reflect their pre-game mood states and facilitate mood repair.

When dealing with negative emotions, multiple-game players are significantly more likely to "stop gaming", "switch to a different playstyle or other tasks in the game", "switch game mode and difficulty setting" or "switch game", and single-game players are more likely (although not significantly) to "endure it" or "use an extraneous game advantage". One interpretation of this result is that multiple-game players have a higher "switch preference"—a tendency that is also exhibited when these players are dealing with negative emotions in gameplay.

5.4 HOW PRE-GAME MOOD STATE IMPACTS PLAYER BEHAVIORS

Pre-game affective states and playstyles

We visualized the emotions associated with pre-game affective states in the arousal-valence system, for analyzing the association between different playstyles and emotions, as shown in Figure 10.

Arousal
high

tense	excited
more aggressive 1	more exploratory 1
only main quests 1	more competitive 2
more conservatively 1	

angry
more aggressive 7
play harder 1
less patient 1

happy
more casual 1
more exploratory 1

frustrated
more aggressive 3
less patient 1
only main quests 1

Valence
negative

Valence
positive

depressed / sad
more careful 1
more exploratory 1

content
confident 1
chatty 1
more exploratory 2

bored
more carelessly 2
less aggressive 1

relaxed
more carelfree 1
more patient 1

tired
less patient 1

calm
more exploratory 1
more relaxed 1

Arousal
low

In general, emotions in negative valence and high arousal (e.g., angry, frustrated, tense) tend to associate with more aggressive playstyles and less patience in game. Players reported that while playing in negative valence and high arousal they play with less patience and strategy, more recklessly. This aggressive playstyle tends to lead to poor in-game performance (although a few players reported recklessness leading to increased performance). Players in such states also tend to only play to advance the story and skip grinding or collecting items during gameplay.

In contrast, when in a more positive affective state, players tend to play at a more relaxed and slower pace, and with more patience and confidence. Participants suggested that this leads to increased performance. In addition to this, players in more positive mood states also reported that they tend to engage in more exploratory activities in the virtual world.

In some games like MOBA games, playing different characters or roles requires different playstyles, some characters require the player to be more aggressive in order to be more effective in a collective team strategy, and some characters requires more strategies, sneakiness and carefulness. In several cases players reported that they chose different characters/roles in game to accommodate their desired playstyle at the moment because of their pre-game mood states.

Game selection and game mode selection

There are 40 cases of which participants state that they make their game selection based on mood (e.g., "stressed", "angry", "relaxed", "energetic"). 13 cases stated that their pre-game mood determined their game mode selection. Games like FPS and fighting action games are more likely to be played to take out aggression and frustration, whereas strategy games, puzzle games, casual games and RPGs tend to be consumed more often when players are in a lower arousal state. However, there are few cases where participants choose FPS or action games to relax when tired. This finding is in line with Bowman's (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010) study about selective exposure on task demand level of games, suggesting a correlation between participants' arousal level and task demand level of the chosen games: higher task demand of videogames leads to greater capacity to reduce stress and boredom. In our finding, FPS and action games demand higher task control, therefore they're favored by the player when they are trying to reduce negative mood states with high arousal.

Playstyle

In general, mood states in negative valence and high arousal (e.g., angry, frustrated, tense) tend to be associated with more aggressive playstyles and less patience in game. Players reported that in such case they play with less patience and strategy behind actions, more recklessly, especially in FPS and RPG games, and aggressiveness tend to lead to more deaths of the player's character (i.e., poor performance) (although recklessness leading to better performance was also mentioned in rare cases). Such a playstyle is likely a way for the frustrated players to let out their aggression and tension. Players in such states also tend to only play to advance the story and skip grinding and collecting items during gameplay.

Qualitive analysis shows that players in a negative valence and high arousal emotional state (e.g., angry, frustration, stressed) tend to engage in a more aggressive playstyle, and also tend to "skip the grinding". It's possible that aggressive playstyle is likely a way for the frustrated players to let out their aggression and tension, similar to playing sports as a way to sublimate aggression and anger. On the other hand, it's reported that when in a positive mood states, players chose to play with more patience and confidence, and also more likely to explore the virtual world or do more side-quests. We speculate that player type (e.g., explorer, achiever, socializer and kill proposed by Bartle (Bartle, 1996)) of one individual may differ in different gaming sessions due to different pre-occurred factors (mood state, time constraint for gaming session), although further investigation is needed for test and verification.

Performance

Results show that pre-game mood state would have a positive or negative impact on game performance, and negative emotions don't necessarily lead to worse self-reported performance. Although negative emotions tend to associate with worse performance, in some cases they could also lead to better performance. This is consistent with the conclusion that in-game success predicts players' mood repair effect by Rieger's experimental study (Rieger et al., 2014), and Fling's finding from a survey study in which adolescent gamers reported that their feelings after gaming was determined by their triumph or defeat in the game(Fling et al., 2006).

5.5 IN-GAME BEHAVIORS THAT PROMOTE MOOD REPAIR

What in-game behaviors do players engage in to help alleviate negative mood?

When dealing with negative emotions, multiple-game players are significantly more likely to "stop gaming", "switch to a different playstyle or other tasks in the game", "switch game mode and difficulty setting" or "switch game", and single-game players are more likely (although not significantly) to "endure it" or "use an extraneous game advantage". Speculatively, multiple-game players may have a higher "switch preference", such that their switching behavior extends to coping with negative emotions experienced during gameplay.

In addition to this, the majority of participants use cheats to customize their gaming experience (although some only rarely). Only 30.93% (N=60) of the participants reported that they never use extraneous game advantages (EGA) to alter gameplay to suit their preferred playstyle. When making a different game selection or game mode selection isn't an available option, players are motivated to use EGA to alleviate negative emotions. One way that they do this is by altering the game's difficulty, which in turn changes the game's pacing. In theory, this would modify the game's arousal levels, as seen in dynamic difficulty adjustment examples. In effect, using EGAs is a good way to tailor the experience to meet mood repair needs. In addition to difficulty moderation, this can be done by customizing the player's avatar or by directly changing the game's pace to fit the time slot available of the current gaming session ("Time constraint" is a theme that emerges across both single-game players and multiple-game players). Cheats or mods provide a variety of additional possibilities to the original game design, enhancing players' play experience with greater autonomy, and more importantly, modify the intervention potential and message-behavior affinity of the content to amplify positive emotional outcome and reduce negative stressors. Using EGA is also considered a way to extend the content of the current game beyond the developers' design, helping players add new elements to the game to "avoid burnout on the same game" without changing the game that they play and have mastery over.

An analogue for EGA doesn't exist in traditional media, affording videogames unique customization options. This further evidences claims by previous researchers that interactivity affords greater control over mood repair (Y.-S. Chen & Raney, 2009) .

5.6 THE PROCESS OF MOOD REPAIR THROUGH NEED SATISFACTION AND PLAYER EXPERIENCE TAILORING

Figure 11: The process for mechanism of mood repair through need satisfaction and gaming experience tailoring
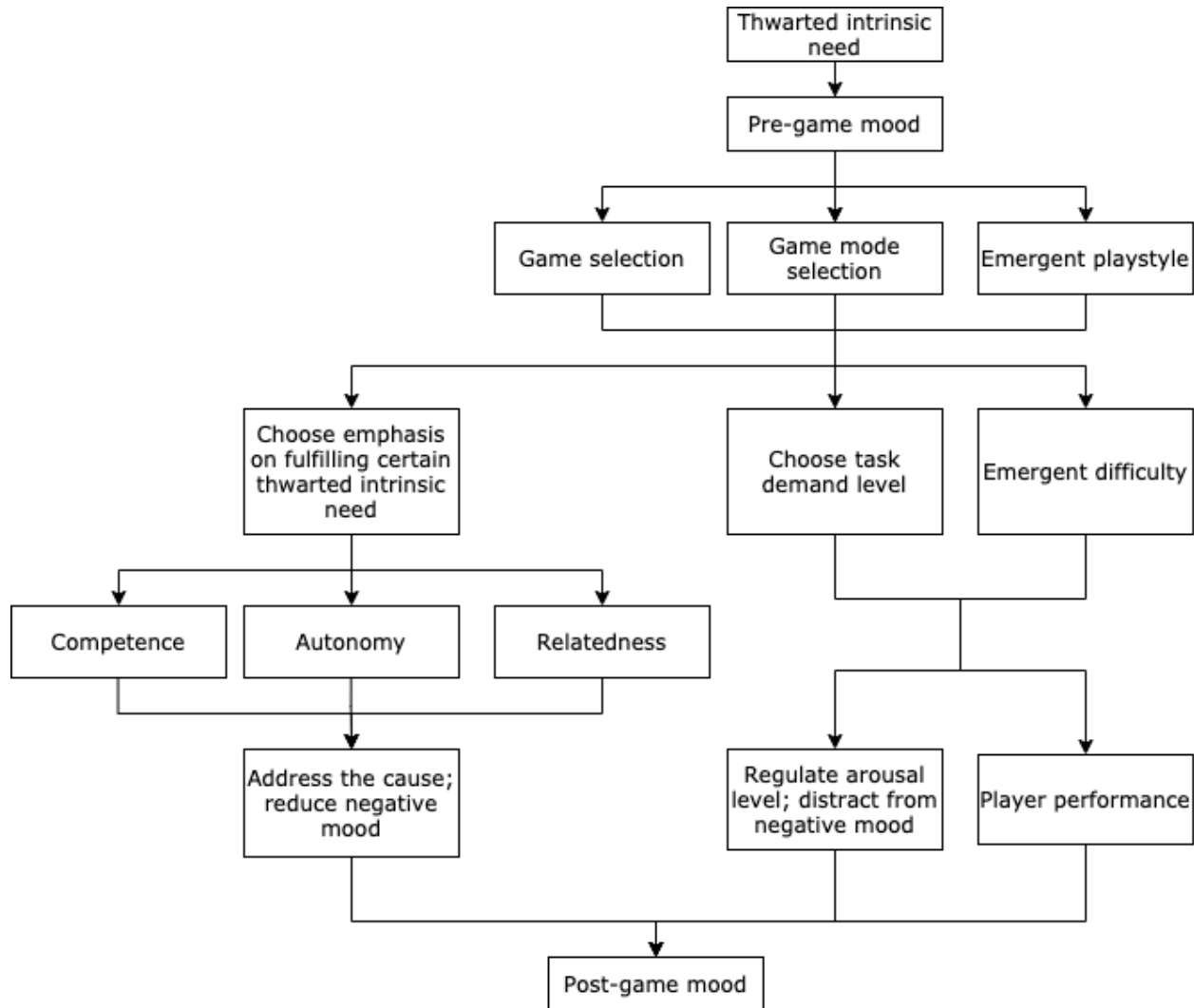
Based on our findings, we propose a process (as shown in Figure 11) through which mood management mechanisms interact with need satisfaction as suggested by Reinecke (Reinecke et al., 2012) and findings on mood repair by Rieger (Rieger et al., 2015, 2014), which stemmed from SDT, MMT and selective exposure theory.

First, negative pre-game mood state would be a result of the player's thwarted intrinsic needs according to SDT. And our findings (4.3.1, 4.4.2) suggest that a player's pre-game mood state could greatly impact the player's choices on game selection, or game mode selection, or

emergent playstyle. This is also similar to Reinecke and Tamborini's (Nicholas D. Bowman & Tamborini, 2012; Nicholas D Bowman & Tamborini, 2015; Nicholas David Bowman, 2010) empirical revelation that frustrated intrinsic needs significantly predict players' choice of task demand level, which suggested that higher task demand of videogames results in higher intervention potential to reduce stress and boredom.

Second, a study on mood management conducted by Rieger (Rieger et al., 2015) suggested that mood repair via videogames was achieved through two underlying mechanisms: addressing the cause of negative mood by need satisfaction and distraction from negative mood by regulating the player's arousal level. Although our study didn't emphasize on the first mechanism, the second mechanism was reflected on our findings (4.4.2). By choosing different games, different game modes or different playstyles, players are able to customize the emergent difficulty and task demand level (e.g., an online FPS game is usually more demanding in quick reaction and coordination than a casual mobile tile-matching game; in MOBA games, "Ranked play" mode is more competitive and difficult than "Quick match"; playing an RPG in a quick and strategic style demands more cognitive attention and quick action on input than playing in a slow and casual style) to regulate their arousal levels. Furthermore, difficulty hugely impacts players' performance and in-game success, which positively correlates with post-game mood states (4.4.2).

Further experimental studies are needed to verify this process empirically. Another thing worth pointing out here is that the use of videogames for enjoyment is different from using videogames for mood repair. As shown in 4.2 and discussed in 5.1, there are various determinant motivations for game selection and game switching, primarily for mood and for enjoyment, and the model here only accounts for the case when players choose videogames for the function of mood repair. As suggested by Rieger (Rieger et al., 2014) and Fling (Fling et al., 2006), the investigation of mood repair as one capacity of videogames should be separated from the investigation of enjoyment, because "Sometimes, some gamers may simply want to compete for the 'thrill of victory' and they may even be willing to accept 'the agony of the defeat' (Fling et al., 2006).

5.7 Advantages of videogames compared to traditional media

Players use game selection, game mode selection, and switching playstyle to tailor their experience to accommodate their mood state. In other words, the interactive nature of videogames allows players to selectively make adjustments in the game to tailor their experience to their needs. Traditional media only affords selective exposure choices, limiting mood repair to the type of content available for consumption. This represents a key advantage in terms of mood repair, in that games allow players to better control the type of content that they would like to experience.

5.8 Implication For Game Designers

For game designers who want to provide players with games that promote mood repair, or simply want the players to spend more of their gaming time in the game (less switching), our suggestion is to increase the affordance for diverse and flexible gaming experiences. Potential implementations include but are not limited to: providing different game modes for different levels of task demand (e.g., competitive and casual), adding various interrelated elements in the game that could be combined in different and creative ways, and granting different playstyles to different characters. Providing the affordance for diverse and flexible gaming experiences allows players to tailor their own gameplay experience to cater different mood states and present varying stimulations in a player-created way.

5.9 Limitations and Future Work

Due to the nature of an unmanipulated study, although we can see some correlations of different behaviors or selections with different pre-game mood states, we can't be sure about the cause and effect relation of these connections. Future manipulated experiments are needed to explore the causal mechanisms underlying these correlations.

We found the impact of different mood states on gaming choices (game, mode, playstyle) and performance in general gaming experience, especially in certain game genres such as RPG

and FPS where players have more degrees of freedom and agency. Future studies could potentially narrow the focus on such impact on these specific genres.

There could have been a few more questions in the survey to help provide more information in the context of the participants' responses. For example, the availability and difficulty of switching games or game modes could vary based on external factors such as the player's time constraint or money available to spare on more games or gaming devices. For some players, switching between games based on their mood states is an obvious and easy option, but for some players this option might not be as accessible.

CHAPTER 6:   CONCLUSION

6.1 CONTRIBUTIONS

First, to investigate videogame players' options and patterns of content switching, especially in the context of mood repair, we gathered data and compared the consumption pattern (i.e., do people consume multiple instances of the same media form during a period of time, or focus on one instance?) between videogames and traditional media forms. We found that the consumption pattern of videogames is similar to TV, where people were more likely to consume multiple instances during a period of time, while podcast and book consumers tend to stick with one instance at a time. Furthermore, players who played multiple games during the same period of time are more likely to consume multiple instances of other media forms as well; in contrast, players who played one single game during a period of time also tended to stick with one instance of other media forms. Also, even for multi-game players, they also tended to have a primary game where they spend most of their gaming time. We investigated the reasons behind playing multiple games and playing only one game during a period of time. The most common determinant theme for playing multiple games was "Mood", while the most common reasons for playing only one game was "Individual focus on one game".

Second, we explored factors of consideration when players were deciding which game to play at any given session, and why players decided to switch to a different game. Thematic analysis revealed that, "Mood" was the primary determinants for both game selection and game switching. 59.8% of the participants considered multiple game modes to be important to their gaming experience. It showed that in relatively frequent occasions, players accommodated different mood states using videogames, by choosing different games or game modes to customize their play experience (e.g., choose a slow-pace RPG for a relaxing oneself, choose a competitive mode to let out aggression) for current session.

Third, we investigated what other adjustments besides game selection and game mode selection players make to tailor their gaming experience based on their mood states. Thematic analysis revealed that players also make adjustments with their playstyle in their gameplay: players in negative valence and high arousal level tended to adapt an aggressive playstyle, and

tended to focus on advancing in the game progress rather than exploring or collecting, while players in a positive mood state tended to be more exploratory, play with more patience and confidence, and often resulted in a better performance. Conversely, players' performance could also have an effect on the players' post-game mood state, in both positive and negative ways. We proposed a process attempting to explain the mechanism of how players' pre-game mood state impacted their decisions on game selection, game mode selection and emergent playstyle in order to accommodate their mood states, and how that influence their post-game mood state and the effect of mood repair.

Finally, we also looked at how players coped with negative emotions in their gameplay, with "switch game", "endure" and "stop playing" as the most popular strategies. Players who played multiple games during the same period of time used "switch game" and "switch game mode" more often, and used "endure" less than players playing only one game during the same period of time.

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APPENDICES

APPENDIX A: SURVEY QUESTIONS

1. Demographics

(1) "What is your age?"

(2) "Indicate your gender:"

["Non-binary", "Female", "Male", "Prefer not to disclose"]

(3) "Do you identify as LGBTQI2+?"

["Yes", "I prefer not to disclose", "No"]

(4) "What is your yearly household income (approximately)?"

["≤ $24,999", "$25,000 - $34,999", "$35,000 - $49,999", "$50,000 - $74,999", "$75,000 - $99,999", "$100,000 or more"]

(5) Please indicate your marital status:"

["Single, never married", "Married or domestic partnership", "Widowed", "Divorced", "Separated", "I prefer not to answer"]

(6) "What is the highest degree or level of school you have completed? If currently enrolled, mark the previous grade or highest degree received:"

["No schooling completed", "Nursery school to 8th grade", "9th, 10th or 11th grade", "12th grade, no diploma", "High school graduate - high school diploma or the equivalent (for example: GED)", "Some college credit, but less than 1 year", "1 or more years of college, no degree", "Associate degree", "Bachelor's degree", "Master's degree", "Professional degree", "Doctorate degree", "I prefer not to answer"]

(7) "Do you have any permanent disabilities (mental and/or physical)?"

["Yes", "No", "I prefer not to disclose"]

(8) "How are you formally identified in terms of race/ethnicity? (Check all that apply)"

["Native American or Indigenous American", "Asian", "Pacific Islander", "Black/African", "Hispanic/Latinx", "White, non-Hispanic", "Two or more of the above or multi-racial", "I prefer not to answer"]

(9) "If you think of yourself in terms of heritage, ancestry, family, or community, how would you describe your race and/or ethnicity?"

(10) "If your family immigrated to the United States, what generation are you?"

["N/A", "1", "2", "3", "4+", "Prefer not to disclose"]

2. Gaming-background

(1) "How many hours per week do you have available to game (including transit, lunch breaks, while working, etc.)?"

["0", "1-10", "11-20", "21-30", "31-40", "41+"]

(2) "How many hours per week do you typically spend playing games (including transit, lunch breaks, while working, etc.)?"

["0", "1-10", "11-20", "21-30", "31-40", "41+"]

(3) "Overall, which genres of games do you generally play?"

["I do not play digital games", "Action", "Platform games", "First Person Shooter", "Beat 'em up", "Adventure", "Role Playing Games", "Mass Multiplayer Role Playing Games (MMORPG)", "Simulation", "Vehicle simulation", "Strategy", "Music games", "Puzzle games", "Sport games", "Multiplayer Online Battle Arena (MOBA)", "Casual games", "Other genre(s) not listed here"]

(4) "At any given time, I tend to be actively playing more than one game - i.e., I tend to play a variety of games and switch between them based on various factors"

["Strongly disagree", "Disagree", "Somewhat disagree", "Neutral", "Somewhat agree", "Agree", "Strongly agree", "Does not apply"]

(5) "At any given time, I tend to be actively watch more than one television series - i.e., I tend to watch a variety of television series and switch between them based on various factors"

["Strongly disagree", "Disagree", "Somewhat disagree", "Neutral", "Somewhat agree", "Agree", "Strongly agree", "Does not apply"]

(6) "At any given time, I tend to be actively reading more than one book - i.e., I tend to read a variety of books and switch between them based on various factors"

["Strongly disagree", "Disagree", "Somewhat disagree", "Neutral", "Somewhat agree", "Agree", "Strongly agree", "Does not apply"]

(7) "At any given time, I tend to be actively listening to more than one podcast - i.e., I tend to listen to a variety of podcasts and switch between them based on various factors"

["Strongly disagree", "Disagree", "Somewhat disagree", "Neutral", "Somewhat agree", "Agree", "Strongly agree", "Does not apply"]

(8) "When I switch between games, I still tend to have one dominant game that I play more than the others. (If you don't switch between games, select does not apply)"

["Strongly disagree", "Disagree", "Somewhat disagree", "Neutral", "Somewhat agree", "Agree", "Strongly agree", "Does not apply"]

(9) "Why do you prefer (or not prefer) to play multiple games at once?"

(10) "How do you decide which game you are going to play at any given time?"

(11) "What is your primary motivation for switching to a different game?"

(12) "It's important to me that games have multiple modes (single player or multiplayer, story/campaign modes vs. battle, competitive-cooperative, ranking vs. casual, etc.)"

["Strongly disagree", "Disagree", "Somewhat disagree", "Neutral", "Somewhat agree", "Agree", "Strongly agree", "Does not apply"]

3. Gaming behavior

(1) "Does your mood change what you want to do in a game, or how you want to do it?"

["Always", "Frequently", "Occasionally", "Rarely", "Never"]

(2) "Does what you do in a game change your mood?"

["Always", "Frequently", "Occasionally", "Rarely", "Never"]

(3) "Other than your performance, does your mood influence the way you play a game?"\
["Always", "Frequently", "Occasionally", "Rarely", "Never"]

(4) "Thinking of your recent gaming experiences, provide two examples of how your mood influences how you play, or explain why it doesn't."

"Second example (if applicable)"

(5) "When frustrated, upset, or bored during gameplay, I...", (5-point Likert scale)

["Endure it", "Stop Gaming", "Switch to a different playstyle or focus on other tasks in the game", "Switch to a different game mode or difficulty setting", "Switch to a different game", "Use an extraneous game advantage (e.g. cheat codes, walkthroughs, game mods, loopholes/exploits)"]

(6) "Of all the options in the previous question (endure it, stop gaming, switch, etc), which one do you do the most often, and why?"

(7) "How often have you used an extraneous game advantage (e.g. cheat codes, walkthroughs, game mods, loopholes/exploits) to alter gameplay to suit your preferred playstyle(s)?"

["Always", "Frequently", "Occasionally", "Rarely", "Never"]

(8) "How often have you used an extraneous game advantage (e.g. cheat codes, walkthroughs, game mods, loopholes/exploits) to alter gameplay to suit your preferred playstyle(s) because the game lacked alternate modes or variations in gameplay?"

["Always", "Frequently", "Occasionally", "Rarely", "Never"]

APPENDIX B: TABLES

Table 21: Content consumption patterns of traditional media and videogames (7 Likert-scale)

Media Form	Videogame	TV	Podcasts	Book
Strongly disagree (1)	15 (7.7%)	12 (6.2%)	35 (18%)	55 (28.4%)
Disagree (2)	30 (15.5%)	24 (12.4%)	30 (15.5%)	54 (27.8%)
Somewhat disagree (3)	18 (9.3%)	17 (8.8%)	12 (6.2%)	24 (12.4%)
Neutral (4)	6 (3.1%)	6 (3.1%)	16 (8.2%)	9 (4.6%)
Somewhat agree (5)	36 (18.6%)	31 (16%)	19 (9.8%)	15 (7.7%)
Agree (6)	44 (22.7%)	42 (21.6%)	20 (10.3%)	17 (8.8%)
Strongly agree (7)	41 (21.1%)	54 (27.8%)	23 (11.9%)	9 (4.6%)
Does not apply	4 (2.1%)	8 (4.1%)	39 (20.1%)	11 (5.7%)
Total	194	194	194	194