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Video Game Addiction And Motivation In Emerging Adults: A Person-Centered Approach

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VIDEO GAME ADDICTION AND MOTIVATION IN EMERGING ADULTS: A PERSON-CENTERED APPROACH

by

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DISSERTATION

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DEDICATION

I dedicate my dissertation to my son, Enzo.

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CHAPTER 1 VIDEO GAME ADDICTION AND MOTIVATION: A PERSON CENTERED APPROACH

Video games are ubiquitous in modern society. With current technology, video games are no longer restricted to the bulky, cabinet games that filled arcades in the 1970's and 1980's. Instead, they are found in homes on consoles or computers, and even in cellphones. With the ubiquity of availability comes widespread usage. Approximately 97% of American adolescents aged 12-17 play video games (Lenhart, Kahne, Middaugh, Macgill, Evans, & Vitak, 2008), and for many, video game playing does not end in adolescence, but continues on into adulthood (ESA, 2012), with an estimated 81% of 18-29 year olds reporting playing (Lenhart, Jones, & Macgill, 2008). Further, the games are no longer restricted to single player or local co-player formats; consoles and computers can connect players all over the world, resulting in the existence of online gaming communities.

Due to the widespread use and availability of video games, concerns have arisen regarding the potential negative impact of video game play. One such concern is focused on the occurrence of a pattern of behaviors that has been referred to as video game addiction, or, alternatively, as problem video game play (PVGP).[1] How PVGP has been conceptualized or measured differs greatly from study to study and may account for some of the controversy surrounding how to define or categorize the phenomena. For example, some studies investigating PVGP or addiction have simply looked at the amount of time spent playing, while others have used measures based on DSM criteria for addiction that assess different thoughts and behaviors related to game play (salience, tolerance, mood modification, withdrawal, relapse, conflict, and problems). In addition, a recent meta-analysis found 5 different terms which were being used to refer to the construct, as well as 7 different assessment scales being used to assess the construct (Kuss & Griffiths, 2012).

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[1] There is a debate in the literature regarding whether the usage of the term video game addiction is appropriate. See Hellman, Schoenmakers, Nordstrom, & van Holst, 2013; Griffiths, 2008; Turner, 2007; Wood, 2007; and Wood, 2008, for an overview of the debate.

Presumably due, in part, to these differences in construct measurement, prevalence estimates of the phenomenon vary greatly. A meta-analysis of prevalence rates of PVGP found an average prevalence of 6%, with estimates ranging from 3.1% to 8.9% (Ferguson, Coulson, & Barnett, 2011).

Recent research suggests that PVGP as measured by a scale based on DSM criteria is more predictive of negative outcomes than measures of just time spent playing video games (Brunborg, Mentzoni, & Froyland, 2014). This suggests that the negative consequences associated with PVGP have less to do with the amount of time the individual spends playing, and more to do with the level of control the individual has over their game play. Thus, though some individuals may be able to work large amounts of game time into their schedules without seeing any negative consequences, individuals exhibiting PVGP may opt to play video games instead of engaging in activities related to self-preservation like studying for an exam or going to work, which could result in serious negative consequences such as failing a course or the loss of a job. Whether due to a clinically diagnosable addiction or due to simply the poor decision-making abilities or problems with time-management as posited by Wood (2007), the end result of the behavioral pattern associated with PVGP can have a negative impact on affected individuals and is a rapidly growing phenomenon which requires further investigation.

Video Game Playing in Emerging Adulthood: Who is at Risk?

Though of the majority of video game research has heretofore focused on adolescents, more recent concerns have emerged about the impact of video game playing on emerging adults. PVGP appears to peak in adolescence, beginning to decline in late adolescence and plateaus during emerging adulthood (Ream, Elliott, & Dunlap, 2013), which may suggest that developmental processes influence the development and maintenance of PVGP. Emerging adulthood can be

defined as a distinct stage of development beginning in the late teens and extending through the twenties, and can be viewed as an extended transition to adulthood (Arnett, 2000). Though no longer feeling like adolescents, in part due to gains in independence, emerging adults also do not yet feel like adults, and have not fully taken on adult roles (Arnett, 2000; Arnett, 2007). Emerging adults typically have yet to make any long term career or familial commitments, thus they are free to explore career, life-style, and relationship possibilities, while working towards becoming what they view as an adult. Thus, successful navigation of this period of life could lead to greater stability in terms of careers and relationships in adulthood.

Though the newfound freedom and independence experienced by emerging adults can provide many opportunities for personal growth, this developmental stage does not come without drawbacks. The emerging adult stage has been characterized as an age of instability; with emerging adults changing residences more often than in any other period of life, for example (Arnett, 2006). Changes in residence have long been found to contribute to stress and risk for illness (Rahe, 1968). Coincidentally, this time period also encompasses the age in which many psychopathologies begin to emerge, including major depressive disorders, bipolar disorder and schizophrenia (Schulenberg & Zarrett, 2006). In addition, emerging adults show increases in binge drinking, marijuana use, and risk-taking behavior when compared to adolescents (Schulenberg & Zarrett, 2006), which may be a result of the relative lack of parental oversight, greater personal control over time management, and increased financial means.

Because of the transitional nature of emerging adulthood, there is an increased potential for negative life course outcomes during emerging adulthood. This undergirds the need for research examining the behaviors and traits that may help identify emerging adults who are at risk for negative outcomes. Video game playing has been identified as one of these potential risks, with

researchers theorizing that time spent playing video games during emerging adulthood could have a negative impact on later development (Padilla-Walker, Nelson, Carroll, & Jensen, 2010). For example, time spent playing video games has been shown to have a negative impact on academic success (Burgess, Stermer, & Burgess, 2012). Though this would certainly affect the quality of their education, this could also impact their future career opportunities and thus their ability to successfully provide for themselves and a family in adulthood. In addition, Padilla-Walker et al. (2010) theorized that time spent playing video games could interfere with identity exploration by distracting emerging adults from serious thought and consideration of possible identities, or even have a more direct negative impact through the potential emulation of violent behaviors; though there is currently little to no research evidence to support these theories.

In addition, the potential for PVGP during the emerging adult period is high. Many emerging adults are now on their own for the first time, being left to make their own decisions, and manage their own time without parental guidance. Not having established a firm career identity may make one's current job or college classes seem less important, as they weigh the immediate rewards they receive from gaming, with the potential impact of gaming on a hypothetical career. Emerging adults have also been shown to have unwavering, yet untested optimism about their future, as Arnett (2006) put it, "In emerging adulthood, virtually no one expects to end up with a dreary, dead-end job or join the nearly 50% of Americans whose marriages end in divorce, or make mistakes that drive life into a ditch" (pg. 13). As such, the decision to play video games instead of go to work or class may come easier to emerging adults than to other age groups. Given the potential negative influence video game playing during emerging adulthood may have on the transition to adulthood and later development, PVGP during this period could have potentially serious consequences. Thus, it becomes imperative to try to further understand what motivates

emerging adults to play video games, determine who may be at risk for PVGP, and whether patterns of motivations differ in individuals at risk, in order to lay the groundwork for successful intervention strategies. Research has illuminated several factors that have been found to be related to PVGP including psychological adjustment, level of identity development, video game genre, and social capital.

Psychological adjustment. Research suggests that there may be a relationship between PVGP and psychological adjustment (Gentile, Choo, Liau, Sim, Li, Fung, & Khoo, 2011; Mehroof, & Griffiths, 2010; Mentzoni, Brunborg, Molde, Myrseth, Skouveroe, Hetland, & Palleson, 2011). A study investigating mental health associations with PVGP in adolescents (12 – 21 years), emerging adults (22 – 27 years) and young adults (28 – 33 years; Mentozoni et al., 2011) found that higher levels of PVGP were associated with higher levels of anxiety, higher levels of depression and lower levels of satisfaction with life. Likewise, Mehroof and Griffiths (2010) reported that higher levels of PVGP were associated with higher levels of both trait and state anxiety in an emerging adult sample. A two year longitudinal study of PVGP in children and adolescents found that anxiety and depression increased with changes in PVGP (Gentile et al., 2011). More specifically, children in their study who showed increases in PVGP over time also showed increases in anxiety and depression scores, while children who showed decreases in PVGP over the course of the study showed decreases in anxiety and depression. Though Gentile et al. (2011) posited that this relationship might be indicative of anxiety and depression being outcomes of the PVGP, other recent research suggests that individuals may be using video game playing to cope with depression and anxiety. For example, in a study of pediatric preoperative anxiety, playing video games was found to be an effective method of reducing preoperative anxiety (Patel, Schieble, Davidson, Tran, Schoenberg, Delphin, & Bennett, 2006). Similarly, a recent

experimental study showed that participants playing video games for an 15 – 45 minutes had reduced depressive symptoms on the post-test when compared to their pre-test levels(Valadez & Ferguson, 2012). These findings may suggest that individuals are seeking out video games as a form of self-medication. If playing video games results in a decrease in depression or anxiety, emerging adults may be more likely to spend more time playing to alleviate those symptoms, resulting in higher levels of PVGP among the most vulnerable within the population. Whether the depression or anxiety is an outcome or potential cause of PVGP, there does appear to be a demonstrable relationship between PVGP and psychological adjustment.

Identity status. Another factor that may be associated with PVGP, and one very salient to emerging adults, is the process of forming a cohesive identity. Erikson (1950, 1968) posited that an important developmental task adolescents had to undertake before their transition to adulthood was the development of a coherent sense of identity. Coined "the identity crisis," Erikson theorized that this crisis occurred in adolescence, yet recent research has supported the idea that while the process begins in adolescence, it continues through emerging adulthood, with the most serious identity exploration and consideration occurring in emerging adulthood (Arnett, 2007; Côté, 2006). Thus, identity exploration and development is one of the defining features of the emerging adulthood period (Arnett, 2000).

Marcia (1966, 1980) developed an empirical model of identity based on Erikson's writings by extracting the dimensions exploration and commitment. The exploration dimension refers to the thoughtful consideration of a variety of possible identities. The commitment dimension refers to the extent to which one has embraced possible identities. Further dividing these dimensions into high and low levels gave way to the development of four identity statuses: achievement, moratorium, foreclosure and diffusion.

Achievement is characterized as being high on exploration and high on commitment. An individual who has reached achievement status is one who has experienced an identity crisis, having explored a variety of possible identities, and finally committed to one or more of these identities (Marcia, 1966). Foreclosure is characterized by having little to no exploration and high commitment. An individual in foreclosure status is an individual who never experienced the identity crisis, but has made a commitment to an identity, often in accordance with family wishes (Marcia, 1966). Moratorium is characterized as being high in exploration, but low in commitment. An individual in moratorium is one who is experiencing the identity crisis and is actively pursuing an identity through exploration, but has yet to establish any firm commitment to an identity (Marcia, 1966). Lastly, diffusion is characterized by low levels of both exploration and commitment. An individual who is in diffusion status may or may not have ever experienced an identity crisis, is not actively exploring possible identities and could even be avoiding thinking about identity altogether. In addition, those in diffusion have not committed to any identities (Marcia, 1966).

The process of exploring and committing to an identity is challenging, and can lead to anxiety. The existential philosopher Sartre described this process as relating to freedom (Sartre, 1956), which follows a similar theme to Arnett's theory of emerging adulthood (2006). Prior to committing to an identity, individuals experience true freedom, facing a sea of endless possibilities for their lives. However, the sheer volume of possibilities to explore can be overwhelming and anxiety provoking, thus, though individuals at this stage are free, and they long to be able to commit to a path to alleviate that anxiety. In choosing a path, however, they are also faced with their own mortality by having to negate potential life paths and choose the one on which they will ultimately stay, thereby further increasing anxiety.

Research on identity statuses seems to support this philosophical view. Individuals in moratorium, those actively exploring this sea of possibilities and facing their mortality in a sense, experience significantly higher anxiety levels compared to those in other statuses (Marcia, 1967), and have higher levels of death anxiety as well (Sterling & Van Horn, 1989). Interestingly, those in diffusion who have yet to explore or commit, experience lower levels of anxiety than those in moratorium (Marcia, 1967, and Sterling & Van Horn, 1989). Individuals in foreclosure, those who committed to a path without the experience of freedom and without being confronted with mortality, have significantly lower levels of anxiety compared to other statuses (Marcia, 1967). Therefore, individuals who are in moratorium, may be experiencing higher levels of anxiety, and could play more video games as a means to alleviate some of that anxiety, putting them at a greater risk for experiencing PVGP.

Further, the lower levels of commitment seen in individuals with diffusion or moratorium statuses could play a role in whether an individual engages in PVGP behaviors. If an individual has yet to make a commitment to a given career identity, their ultimate grade for a college course may not be of high importance, so the decision to miss class or not study in lieu of more playtime may be easier to make. The same could be said about an individual who opts to call off of work to play; if they have not committed to a career path, that job may not be important to them. Thus, individuals in moratorium or diffusion statuses due to their lack of commitment to an identity may be more likely to engage in PVGP behaviors, as they may not see those behaviors as being detrimental to their future. Similarly, individuals who have committed to a social identity as a gamer may also be more likely to engage in PVGP. If an individual sees gaming as being an important component of who they are, they may be more likely to engage in PVGP behaviors as video game playing may be more important to them.

Genres and game characteristics. There are many different genres of video games on the market. A recent study examining the relationship between genre and PVGP in 15 genre categories found that longitudinal trajectories for both problem play and engagement (measured in terms of pleasure derived from gaming, self-expression, and identification) differed greatly as a function of genre (Elliott, Ream, McGinsky, & Dunlap, 2012). The differences in PVGP by genre may be due to underlying structural characteristics common within each genre.

A five feature model of video game structural characteristics was recently developed by (King, Delfabbro, & Griffiths, 2010) which included social features, manipulation and control features, narrative and identity features, reward and punishment features, and presentation features. 1) The social features of a game refer to the ways in which gamers can communicate with each other. For example, some games may offer a rich social community with guilds, teams, trading, and chat; other games may only have a single player mode or a leaderboard. 2) The manipulation and control features of a game refers to the ways in which the player physically interacts with the game, the save features of a game, and the in-game displays. For example, in some games you may be able to save the game at any point allowing a player to stop at any time, but for other games you may only be able to save progress at specific points in the game, which promotes extended play. 3) Narrative and identity features refer to the ways in which a player can assume an identity in the game and their role in storytelling. Some games allow users to customize many aspects of their character (e.g. physical characteristics, psychological characteristics, skills), and develop their character over time, while other games may limit customization to weapon choice. Role-Playing Games often allow the character to make decisions that directly influence the course of the game, effectively allowing them to take an active role in the storytelling process. 4) The reward and punishment features of a game refer to the ways in which players are reinforced for game play.

Similarly to slot machines, some video games make use of variable and fixed ratio reinforcement schedules (Chumbley and Griffiths, 2006), to keep individuals playing. Additionally, some games include special events and rare items that can take a large amount of play time to acquire. 5) Finally, presentation features refers to differences in aesthetic features of the game, such as graphics, sound, and whether the game is a part of a franchise.

The bulk of the research examining the relationship between genre and PVGP has focused on what are known as Massively Multiplayer Online Role Playing Games (MMORPGs). These are online games in which thousands of individuals assume the role of characters in what is essentially a virtual society. Many stages of the game are designed to be played in teams, and players often organize themselves into guilds in order to facilitate easy access to team making. MMORPGs have been found to be associated with PVGP (Collins & Freeman, 2013; Elliott, Ream, McGinsky, & Dunlap, 2012; Ream, Elliot, & Dunlap, 2013; and Smyth, 2007). Though individuals who are attracted to playing MMORPGs may differ from individuals who prefer other genres, there are also structural characteristics of MMORPGs that make them more likely to result in PVGP. First, MMORPGs do not have a clear ending; finishing the main storyline allows the player access to never ending endgame material. Game developers release updates to the game fairly often, adding in additional endgame material and new items to keep players committed. Second, MMORPGs have a social component as players often align themselves into guilds, which leads to social pressure to play and play well (Moon, Hossain, Sanders, Garrity, & Jo, 2013). Third, the games often involve missions that need to be completed in full. This means that a player cannot simply pause or save the game at any time to complete the mission later. Though an individual can quit a mission at any time, if they quit a team mission they jeopardize that mission for the team members and risk upsetting the other team members, which could negatively impact their ability

to play the game later. These characteristics result in a high level of time commitment from players, which has been supported by research. In a prospective study, individuals randomly assigned to MMORPGs played significantly more than those assigned to play arcade, console or computer games, playing an average of 14.4 hours per week and reporting that playing interfered with relationships and schoolwork (Smyth, 2007). Thus, even individuals who did not self-select to play an MMORPG spent significantly more time playing than individuals assigned to other game types, supporting the idea that the structural characteristics of the gam have an impact on PVGP.

Even in the absence of social pressure from an online community, Role Playing games appear to have characteristics which may contribute to PVGP. Ghuman and Griffiths (2012) investigated differences between online Real Time Strategy games, online Role Playing Games, and online First Person Shooter games. To be clear, online Role Playing games differ from their massively multiplayer counterparts in that there are far fewer players, and the games have both single player and multiplayer options. Ghuman and Griffiths (2012) found that individuals playing online Role Playing games tend to spend significantly more time playing compared to individuals playing online Real Time Strategy and online First Person Shooter games (Ghuman & Griffiths, 2012). Thus, knowing what types of games an individual plays may provide important information for determining risk for PVGP.

Interestingly, PVGP for MMORPGs appears to be related to age, with PVGP being higher in emerging adults, than in adolescents (Ream et al., 2013). This may be due to the newfound freedom experienced by emerging adults. Adolescents are still typically being supervised by their parents and may have explicit time restriction on video game playing. Even for those who do not have explicit time restrictions for gaming, they at least have a parental figure to make sure they do their homework and go to class. Emerging adults, particularly those living on their own, are for

the first time in their lives having to make decisions regarding how to manage their time. Thus, due to the lack of parental oversight, they may be more likely to opt to play instead of do homework or go to class. Emerging adults also have been found to spend more time alone than any other age group (Larson, 1990), and as a result may be interested in playing MMORPGs for the community/social aspect. Financial cost may also play a role, as MMORPGs typically either require a monthly subscription (which adolescents may not be able to afford), or offer additional items and content that have a cost, and can add to the prestige of a player within their guild. Though rates of PVGP in MMORPG players peaks in emerging adulthood, recent research has also shown that the overall trajectory eventually declines, which is consistent with the theory that as emerging adults are taking on new adult roles, they are decreasing their play time (Ream et al., 2013).

Social capital. The concept of social capital is widely used in a variety of disciplines (Lin, 1999). The term can be used in a broader community level sense, such as when Putnam (1995) wrote of the decline of civic engagement, neighborliness and social trust in America. It can also be used in reference to the individual level, in terms of social interactions. At this individual level, social capital involves investing or engaging in social interactions with the expectation of a return on that investment (Lin, 1999). The return, or capital, from these investments comes in a variety of forms and could include information about a job opportunity, influence over hiring or a promotion, heightened social status, or even emotional support. Social capital at the individual level can be further delineated into two types of capital: bridging capital and bonding capital (Putnam, 1995). Bridging capital refers to interactions between loosely tied individuals, while bonding capital refers to interactions between tight-knit individuals like close friends or family members.

Research suggests a link between PVGP and social capital. Collins and Freeman (2013) investigated social capital in PVGPs and non-PVGPs. Their results indicated that PVGPs had higher levels of online bonding and bridging capital, and lower levels of offline bonding and bridging capital when compared to non-PVGPs. Other research has examined the relationship between video game playing and aspects of social interaction that could be related to social capital, and have supported the idea that relationships within the online gaming community seem to be superior to those offline. Individuals playing online Real Time Strategy games are less likely to report making new friends in the game compared to those playing online First Person Shooters and online Role Playing games (Ghuman & Griffiths, 2012). Gamers who play First Person Shooters are more likely to have good friends in the game compared to those playing online Role Playing games or online Real Time Strategy games. Individuals playing online Role Playing games, were also more likely to date someone from the game in real life, and more likely to discuss sensitive issues with other gamers, compared to those playing Real Time Strategy or First Person Shooter games. These findings support the presence of bridging and bonding ties online, and suggest that there may be some differences in online social capital by genre. Similarly, high levels of video game and internet use in emerging adults were related to lower relationship quality with both friends and family (Padilla-Walker, Nelson, Carroll, & Jensen, 2010), further supporting a lower level of offline social capital. The methods employed in these studies, along with gamers being a self-selecting population, make causal inferences about the direction of the relationship difficult. One prospective study that assigned individuals to play either console games, arcade games or MMORPGs and found that those in the MMORPG group spent more time playing, and made more online friendships, but also reported a greater degree of interference with real-life socializing (Smyth, 2007). This is fairly consistent with the notion that MMORPGs due to their social nature

require higher levels of player commitment, and thus a person assigned to play an MMORPG would exhibit high levels of play time, have a greater need for making new in-game relationships and do so potentially at the expense of real-world interactions. However, there are some traits of self-selected gamers that could strengthen this relationship. Kowert and Oldmeadow (2013) investigated the relationship between video game involvement and social skills and found that higher levels of involvement were related to lower levels of social expressivity. Thus, those individuals with higher levels of involvement with video games had difficulty engaging other socially. Trying to socially engage individuals within the context of a video game may be perceived as easier for these individuals, as social interactions are geared towards the shared activity of game play, which could reduce social pressure by essentially allowing game play to guide the conversation.

Motivation

Certainly, people play video games for fun and for entertainment purposes (Olson, 2010), but as Maslow (1943) suggests, behaviors typically have more than one motivation. Indeed, Maslow (1943) proposed that a hierarchy of basic needs underlies human behavior: physiological needs, safety needs, belonging needs, esteem needs and self-actualization needs. According to this theory, individuals are motivated to pursue higher order needs only after satisfaction of previous needs. For example, physiological needs such as eating, drinking and sleeping are met before we experience the drive to meet safety needs, such as acquiring employment or resources. The needs however are not entirely discrete and can exhibit a sort of dynamic interplay, and thus an individual could opt to pursue a different occupation as a means of acquiring more resources to acquire greater access to food.

In this theoretical framework, for most individuals, video game playing would not be motivated by physiological and safety needs. There are certainly individuals out there for whom this would be relevant, such as professional gamers or video game testers, both of which derive income from playing video games. But for the vast majority of individuals, those needs would have to be met in some capacity to in order to facilitate video game play, as money is typically necessary to purchase video games, consoles, subscription fees, computers and internet access. However, previous research seems to support the idea that video game playing may tap into higher level needs such as belonging, esteem and self-actualization.

Maslow (1943) characterizes belonging needs as the desire to find love and have friends. Previous studies suggest that video game playing both online and offline supports social interaction, the development of friendships and even the development of romantic relationships (Ghuman & Griffiths, 2012; Smyth, 2007; Yee, 2006). Though sometimes thought of as a solitary activity, many video games provide offline multiplayer options, allowing for video game playing to provide an opportunity and context for social activity. Interestingly, beyond simply playing video games with other people, video game play provides a source of conversation outside of the context of actual game play (Olson, Kutner, & Warner, 2008), allowing individuals a topic for conversation and a chance to relate to others. Many video games are online or have online options, allowing players to connect with other players around the world. Some types of games, such as MMORPGs, make social interaction a necessary component of game play by requiring individuals to work in teams to complete levels and proceed with story and gameplay. In addition, multiple attempts at making scales to assess motivation for video game playing have resulted in social dimensions. Yee (2006) developed a scale for measuring motivation for play in MMORPG players, which yielded a social dimension, characterized by the desire to socialize with other players,

develop long-term relationship with other players and the desire to be part of a group effort or team. Ryan, Rigby, & Przybylski (2006) also attempted to measure motivation for video game play with a model derived from self-determination theory, which again resulted in the appearance of a relatedness component, which they characterized as a need being met by the opportunity video games afford individuals to work with other players to accomplish goals and to socialize within game Thus, it would appear that video game playing is driven in part by a need to relate to others.

Esteem needs were characterized by Maslow (1943) as the need for high evaluations of oneself based on the real skills, achievement and respect from others. Research on video game playing motivation seems to support the idea that the need for esteem may underlie video game playing. In Yee's (2006) measure, achievement was another dimension of video game playing motivation that surfaced. Achievement refers to the desire to achieve power or status, optimal character performance in terms of game mechanics, and successfully compete with other players. As well, Ryan et al. (2006) found in their measure that video game playing met the need for competence, as individuals attempt to meet the challenges brought by the video games with their skill levels.

Maslow's (1943) conceptualization of self-actualization is the desire to meet one's potential, or to become what one is capable of becoming. Maslow saw this need as differing from other needs in that it was not driven by any deficiency; it is considered to be a growth need. Thus, this need can be associated with things like creativity, autonomy, morality and problem solving. Research may also support video game playing as meeting the need for self-actualization. Many video games present players with a great amount of autonomy. Role Playing games, for example, typically allow players to make decisions that influence the development of their character (i.e. choosing which skills to master) or influence the story arch of the game. Yee's (2006) motivation

measure yielded a dimension he called immersion, which consisted of the desire to discover things in the game, the desire to role-play or create a character and story, and the desire to customize the appearance of their character. Similarly, Ryan et al. (2006) identified autonomy as a need in their model, which was defined as being met by the ability for players to have options and thus control over many aspects of the game including plot, character skill mastery and the look of the character. Some game types support high levels of creative expression, often by allowing more tech-savvy individuals to modify the game contents. For example, the game Starbound allows players to modify aspects of content such as creating new species, new storylines and new equipment, and has an online forum for people to share their "mods" (i.e., modifications) with other players. Additionally, some types of games allow individuals to take up leadership and teaching roles within the game community (Yee, 2006). For example, in MMORPGs, players often organize themselves into communities called guilds, which can have guild leaders who help organize activities within the guild and moderate their community. Video games also afford the players the opportunity for problem solving. The amount of strategic thinking about these problems appears to increase as a function of play frequency (Blumberg, Rosenthal, & Randall, 2008). As well, more experienced players often help new players, or "newbies", by teaching them strategies to effectively pass levels of the game. Thus, video game playing may be driven by a need for self-actualization, as it relates to opportunities for creative expression, leadership and teaching roles, and problem solving.

An additional motivating factor not directly addressed in Maslow's model involves self-regulation of emotions. In Yee's (2006) measure, one of the facets of his Immersion dimension was Escapism, essentially the extent to which one played as a means of relaxing or avoiding thinking about real world problems. Hagström and Kaldo (2014) improved upon the concept of

escapism utilized in Yee's measure by focusing solely on negative or avoidance aspects of escapism and found that this negative escapism was related to higher levels of PVGP and psychological distress, and lower levels of satisfaction with life. In addition, the usage of video games to regulate emotions appears to differ by age, as emerging adults have been found to be more likely to use games to relieve stress and anger compared to preteens (Funk, Chan, Brouwer, & Curtiss, 2006).

In summary, it may be possible that video game playing presents a positive contribution to the fulfillment of basic needs, which may motivate emerging adults to play. In particular, video games present emerging adults with opportunities to develop friendships, or enhance existing ones; to feel as though they are a part of a community; to enhance self-esteem and gain respect from others; to express themselves creatively; and can even present opportunities to teach or lead others. Video games may also provide emerging adults with an outlet for stress and anger, allowing them to use the games to regulate their emotions. It may be the case that emerging adults who express lower satisfaction with life, and lower levels of satisfaction with their basic needs, may be more likely to use video game playing for emotion regulation, or to avoid thinking about real world problems.

The Present Study

The present study employed a cross-sectional design to investigate PVGP in emerging adults. College students from a large, urban college, who play video games and are between the ages of 18 and 30 were recruited for this study. Participants completed an online survey that asked questions about depression, anxiety, satisfaction with life, identity status, social capital, video game involvement, PVGP, needs satisfaction and escapism. Results from these surveys were used

to answer two key questions: Which emerging adults are at risk for PVGP, and Why do emerging adults play video games?

Which emerging adults are at risk for PVGP? Many studies have taken a variable-centered approach to identifying factors related to PVGP. Variable-centered approaches are focused on determining relationships between variables, and do not take into account that the variables being analyzed are really psychological processes of individuals, that those processes operate together as a part of a dynamic system. As a result, the statistics generated by variable-centered approaches often fail to accurately describe individuals in the sample (von Eye, & Bergman, 2003). Person-centered approaches keep the relationships between variables within individuals intact, and focus on grouping individuals with similar trait organizations. This type of approach may be more useful in identifying individuals at risk for PVGP, who may not be adequately described by variable-centered analyses. Thus, the present study utilized a person-centered approach to group emerging adults based on their identity status; level of depression; level of anxiety; level of satisfaction with life; levels of online and offline social capital; and video game involvement. Though it can be difficult to predict the number of groups that will manifest in a cluster analysis, it was expected that there would be at least 3 groups representing differing levels of PVGP risk: a high risk group, a medium risk group and a low risk group. Based on the findings of previous research, it was expected that a high PVGP risk group would emerge characterized by high levels of depression, anxiety, online capital, and video game involvement (higher levels of play time, higher level of identification as a gamer, and more likely to play higher commitment games such as MMORPGs or RPGs); low levels of life satisfaction, and offline social capital; and moratorium or diffusion identity statuses. It was similarly expected that a low PVGP risk group

would emerge exhibiting low levels of depression, anxiety, online capital and video game involvement; high levels of offline social capital; and achievement or foreclosure status.

Why do emerging adults play video games? In investigating motivation for video game play in emerging adults, a few hypotheses were proposed. It was expected that motivation for play would vary as a function of PVGP risk for such that individuals in the higher risk cluster would exhibit higher levels of need satisfaction from video game play, than those in the medium or low risk clusters. In addition, it was expected that individuals in the high risk cluster would exhibit higher levels of escapism than those in other clusters. Finally, it was expected that lower levels of satisfaction with physiological and safety needs would be related to higher levels of escapism.

CHAPTER 2 METHOD

Participants

Seven hundred undergraduate students were recruited from psychology courses to participate in this study. Of these 700 participants, 5 participants dropped out of the study. Participants with a survey duration less than 15 minutes were dropped from the sample, as the average survey duration was 39.71 minutes and it is unlikely that participants could provide serious consideration of the questions within that time frame. In addition, one participant was dropped from the sample due to indicating an age outside of the study range (0), bringing the total number of participants included in the sample to 668.

Of these 668, 467 participants were gamers, and the remaining 201 participants were non-gamers recruited for comparison. Individuals were identified as gamers if they listed a game preference. The mean age for the sample (N = 668) was 20.63 (*SD* = 2.50), with participants ranging in age from 18 – 30 years. The sample had a disproportionate number of females, with females making up approximately 71.6% of the sample (see Table 1). In terms of ethnicity, 39.1% of the sample identified as Caucasian, 17.5% identified as Middle Eastern, 17.2% identified as African-American, 14.1% identified as Asian-American, 4.6% identified as Multiracial, 3.6% identified as Other, 3.3% identified as Hispanic, 0.4% of the sample identified as Native American, and 0.10% of the sample identified as Pacific Islander. Most participants in the sample identified as single (92.4%), with only 2.2% identifying as being married, and 0.1% of the sample identifying as having been divorced. The majority of the sample indicated working part-time (56.9%), with 30.4% having indicated unemployment, and 12.7% having indicated full-time employment. Sample characteristics are presented in Table 1. Though previous research found high levels of

game play in emerging adult populations, only 48.1% of the sample reported an average play time per week greater than 0, and 69.9% reported having a favorite type of game.

Because individuals between 18 and 30 years of age can vary in terms of how well they fit the characteristics of emerging adulthood. The Inventory of the Dimensions of Emerging Adulthood (IDEA; see Appendix K; Reifman, Arnett, & Colwell, 2007) was used. The IDEA is a 31 question self-report measure that assesses individuals on six dimensions of emerging adulthood: Identity Exploration, Experimentation, Instability, Other-Focused, Self-Focused, and Feeling "In-Between". Participants are asked questions like, "Is this period of your life a time of exploration?", and must respond on a 4 point scale ranging from strongly disagree to strongly agree, with higher scale scores indicating a higher level of each dimension. For the full sample on average, this appears to be a time of moderate identity exploration, experimentation, instability, self-focus, and "feeling-in-between", and a low-to-moderate time of focusing on others (see Table 2). This would suggest that this sample as a whole fits well with the criteria of an emerging adult population.

Measures

Identity status. Identity status was assessed with The Objective Measure of Ego Identity Status (OM-EIS; Adams, Shea, & Fitch, 1979). The OM-EIS is a 24 item self-report measure of identity status in the domains of occupation, politics and religion (See Appendix B). Respondents indicated the extent to which they agreed with each statement utilizing a 6 point scale ranging from Strongly Agree to Strongly Disagree. The scale provides continuous scores on the four identity statuses: Achievement, Moratorium, Foreclosure, and Diffusion. Data concerning reliability and validity of the OM-EIS is presented in Adams (1999).

Video game involvement. This study assessed game involvement utilizing a similar involvement measure employed by Kowert and Oldmeadow (2013). With this measure, game

involvement is conceptualized as being comprised of play frequency, game variety, and social identity. Play frequency was assessed by having participants report average weekly play time in hours. Participants were asked which genre (i.e., Action-Adventure, MMORPG, Role Playing, First Person Shooter, Other Shooter, Real Time Strategy, Other Strategy, Board/Card Games, Sports, Puzzle, Rhythm, Driving, Platformer) they play the most often (See Appendix C). The extent to which participants identify with the gaming community was assessed with a measure developed by Doosje, Ellis and Spears (1995) and revised by Kowart and Oldmeadow (2013). The measure is a four item scale where participants were asked to indicate their level of agreement on a 7-point Likert scale ranging from Strongly Disagree to Strongly Agree (See Appendix C). The scale has a reported coefficient alpha of .96 (Kowart and Oldmeadow, 2013).

Social capital. Social capital was measured with the Internet Social Capital Scales (ISCS; Williams, 2006). The ISCS is a 40 item self-report measure that assesses social capital in both online and offline domains. The measure consists of two 10 item subscales evaluating bridging and bonding social capital offline, and an additional two 10 item susbscales evaluating bridging and bonding social capital online (See Appendix D). Offline and online subscales only differ by 1 word (offline/online). Participants indicated their level of agreement on a 5-point Likert-type scale ranging from Strongly Agree to Strongly Disagree, with higher scores indicating higher levels of social capital. All subscales have been found to have good reliability, with coefficient alphas of .92, .94, .89 and .92 being reported for the offline bridging, online bridging, offline bonding and online bonding scales respectively (Collins & Freeman, 2013).

Depression. Depression was assessed with the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a self-report measure designed to assess depression symptoms in non-clinical populations. The scale consists of 20 statements describing a

variety of feelings and behaviors (See Appendix E). Participants were asked to rate how often they experienced each feeling in the past week. Responses include "rarely or none of the time (less than 1 day)", "some or a little of the time (1-2 days)", "occasionally or a moderate amount of the time (3-4 days)", and "most or all of the time (5-7 days)". Scores range from 0-60, with scores ≥ 16 indicating depression. The reliability coefficient of the CES-D for use in the general population is .85, and for use in the clinical population is .90.

Anxiety. Anxiety was assessed with the Trait scale of the State-Trait Anxiety Inventory (STAI-T; Spielberger, Gorsuch, & Lushene, 1970). The STAI-T is a 20 item questionnaire designed to measure enduring symptoms of anxiety (See Appendix F). For each item, participants were asked to indicate how they generally feel on a 4-point Likert type scale ranging from 1 (almost never) to 4 (almost always). Scores range from 20-80. Internal consistency for the STAI-T has been found to range between .83 - .92 (Foa, Feske, Murdoch, Kozak & McCarthy, 1991).

Satisfaction with life. The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) consists of five statements intended to measure global life satisfaction (See Appendix G). Participants indicated their level of agreement with the statements on a 7 point Likert-type scale ranging from Strongly Agree to Strongly Disagree, with greater scores indicating greater levels of life satisfaction. The SWLS has been shown to exhibit strong internal reliability, with a coefficient alpha of .87 (Diener et al., 1985). In addition, the measure has been found in a variety of studies to exhibit good construct and discriminant validity (Pavot & Diener, 1993).

PVGP. PVGP was assessed with the Game Addiction scale (GA; Lemmens, Valkenburg, & Peter, 2009). The GA is a 21 item self-report measure of PVGP, with questions evaluating Salience, Tolerance, Mood Modification, Withdrawal, Relapse, Conflict, and Problems associated with video game play (See Appendix H). Participants were asked to indicate how often thoughts

or behaviors occurred on a 5-point Likert type scale ranging from Never to Very Often. Lemmens et al. (2009) reported a coefficient alpha of .95.

Needs Satisfaction. Needs satisfaction was measured utilizing The Five Need Satisfaction Measures (FNSM; Taormina & Gao, 2013). The FNSM consists of four 15 item scales measuring Physiological Needs, Safety-Security Needs, Belongingness Needs, Esteem Needs, and one 12 item scale measuring Self-Actualization (See Appendix I). Respondents were asked to indicate the extent to which they agreed or disagreed with being completely satisfied with each item on a 5-point Likert type scale ranging from Strongly Disagree to Strongly Agree. Taormina and Gao (2013) reported good reliability for all scales, with coefficients ranging between .81 and .91. In addition, for each item participants will be asked, "How much does video game playing contribute to your satisfaction with this?" and participants will respond with a percentage ranging from 0% - 100%.

Negative escapism. Negative escapism was measured with a 3 item self-report scale created by Hagström and Kaldo (2014, See Appendix J). Participants responded to the items on a 5 point scale ranging from Never to Always. Hagström and Kaldo (2014) reported a Cronbach's alpha of .85.

Procedure

Participants volunteered and were selected through the SONA research participation system. Once selected for the study, they completed informed consent and answered the questionnaires online through the SONA system.

CHAPTER 3 RESULTS

Preliminary analysis

Data were analyzed in SPSS 23. Of the 668 participants, only 354 participants had complete data, which is problematic for the primary analysis strategy employed. A missing value analysis was conducted with Little's Missing Completely at Random test, which was not significant (χ^2 (6), $p = 0.64$), suggesting that the missing data were missing completely at random. However, in examining the individual items of the three variables with the largest quantity of missing data, three potential patterns appear to emerge. Belongingness Needs was the variable with the most missing data (41.7%), as shown in Table 3. An examination of the missing data for individual items of the assessment showed that questions 3, and 10 had high levels of missing data (204, and 213 respectively). These items pertain to satisfaction with the love they receive from their spouse/partner, and their satisfaction with how much their spouse/partner cares for them. Furthermore, Physiological Needs also had a large amount of missing data (28.4% as shown in Table 3), and examination of the individual questions showed that the two questions with the most missing data (question 8, missing 148; question 9, missing 169) pertained to their satisfaction with the quality and amount of sex they were having. A correlation between Belongingness Needs and Physiological Needs was significant ($\Phi = 0.40$, p < .05), with 139 participants (20.8% of the overall sample) having missing data for both variables, which could suggest that individuals missing data on those variables may not be in a relationship. Two other questions on the Belongingness assessment had high rates of missing data: question 1 (missing 11%), and question 5 (missing 11.7%). Question 1 assesses satisfaction with the amount of rapport they share with people, and question 5 assesses camaraderie with colleagues. It is possible that the vocabulary in these questions was problematic, or that these concepts are not pertinent to an emerging adult sample.

Identity Status also had a large amount of missing data (34%). An investigation of the individual items in the assessment showed that questions 13, 17, and 21 (missing 9.7%, 8.2%, and 14%, respectively) had large amounts of missing data. Two of these questions assess foreclosure of political views, and the third assesses foreclosure of religion. Though the implications of this pattern of missing data are unclear, it does suggest a pattern associated with identity foreclosure.

Due to the large amount of incomplete cases, missing data were imputed using the Expectation-Maximization (EM) algorithm. Though multiple imputation is a superior method of imputation, the cluster analysis cannot be done with multiple imputation. In SPSS, multiple imputation generates multiple data sets of estimates, and uses these multiple sets when performing analyses. Once these data sets have been generated, SPSS provides a limited number of statistical tests that will work with multiply imputed data, which does not include cluster analysis.

Given that the aim of clustering is to classify individuals in a sample of a population based on their unique characteristics, outliers were not removed from the sample unless the outlier was outside the range of possible scores for the variable, and thus an outlier due to error (Romesburg, 1984). No outliers met this exclusion criteria. Depression, Online Bonding, Offline Bridging, Offline bonding, Belongingness Needs, and Esteem Needs exhibited significant skew. Square root transformations were conducted to normalize Depression and Online Bonding. Reflected square root transformations were conducted to normalize Offline Bonding, Offline Bridging, Belongingness Needs and Esteem Needs. Average Weekly Gaming Hours, PVGP, Social Identification as a Gamer, Escapism, Percentage of Needs Satisfied by Gaming (Physiological, Safety, Belongingness, Esteem, and Self-Actualization), and Online Bridging exhibited severe skews due to a disproportionate amount of participants indicating the lowest score possible for each scale. Average Weekly Gaming Hours, PVGP, Social Identification as a Gamer, Escapism

and Online Bridging were transformed into ordinal level data. Percentage of Needs Satisfied by Gaming for each of the five needs was dichotomized (attribute satisfaction to gaming; do not attribute satisfaction to gaming).

Gamer and non-gamer comparisons

Gamers and non-gamers were compared on ethnicity, marital status, employment status, and identity status with chi-square tests of independence. There was a significant relationship between gaming status and ethnicity ($\chi^2(8, N = 668) = 28.19$, $p < 0.05$, Cramer's V = 0.21). As shown in Table 1, there were more Caucasians in the gaming group compared to non-gamers. There was a significant relationship between gaming status and employment ($\chi^2(2, N = 668) = 7.40$, $p < 0.05$, Cramer's V = 0.11), as shown in Figure 1. Gaming status was not related to marital status or identity status.

Scores for depression, trait anxiety, online and offline social capital, need satisfaction, and satisfaction with life for gamers and non-gamers were compared using Independent Samples t-tests for continuous DVs, and with Kruskal-Wallis tests conducted for ordinal DVs. Gamers and non-gamers did not significantly differ on their level of depression, trait-anxiety, satisfaction with life, offline bridging capital, online bonding capital, offline bonding capital, and overall satisfaction with each of the 5 needs (see Table 4). The Kruskal-Wallis test examining online bridging was significant ($\chi^2 (2, N = 668) = 200.43$, $p < 0.05$), indicating that the ranked online bridging was not equally distributed across gamers and non-gamers. Gamers ($M = 31.01$, $SD = 10.84$) had a significantly higher rank order of online bridging compared to non-gamers ($M = 28.53$, $SD = 10.90$).

Hypothesis 1

It is expected that there will be at least 3 groups representing differing levels of PVGP risk: a high risk group, a medium risk group and a low risk group.

Cluster analysis. Identity status, video game preference, number of play hours per week, gamer social identity, online bonding capital, online bridging capital, offline bonding capital, offline bridging capital, depression, anxiety, and satisfaction with life were analyzed with a hierarchical cluster analysis utilizing squared Euclidian distance and Ward's method to identify the appropriate number of clusters. Ward's method is an agglomerative hierarchical clustering method aimed at minimizing the within group variance of clusters (Romesburg, 1984). The method starts with *N* clusters and at each step 2 clusters are combined to minimize the error sum of squares. This agglomeration process continues until all *N* are placed within a single cluster.

Variables in the cluster analysis were standardized by transformation to Z scores prior to entry in order to prevent variables with larger metrics from having a disproportionate influence on the distance measure used in the analysis (Norusis, 2012). Typically, the dendrogram and agglomeration tables are used to determine the appropriate numbers of clusters (Burns & Burns, 2008; Norusis, 2012; Romesburg, 1984). The agglomeration table was examined, but the coefficient increased at a steady increment at each step; typically a large jump in the size of the coefficient is a good indicator of the number of clusters that should be derived from the analysis (Burns & Burns, 2008; Norusis, 2012; Romesburg, 1984). The distances between branches on the dendrogram suggested a 3 cluster solution. The cluster analysis was run a second time using the same methodology, and forced the procedure to determine a 3 cluster solution. Descriptive statistics for each cluster are provided in Table 5.

Identity Status. To characterize the population of each cluster, a variety of statistical tests were performed. A chi-square test of independence was executed to determine the relationship

between cluster membership and identity status. There was a significant relationship between cluster membership and identity status ($\chi^2(4, N = 467) = 37.75$, $p < 0.05$, Cramer's V = 0.20). As shown in Figure 2, no participants in Cluster 1 were in moratorium, while a higher than expected number of participants in Cluster 2 were in moratorium. Cluster 3 had a higher than expected number of individuals in diffusion. It is also important to note that no participants in either cluster were categorized as having achieved identity.

   Psychological adjustment. To characterize the groups in terms of their psychological adjustment, three one-way ANOVAs were conducted examining depression, trait anxiety, and life satisfaction. Levene's test of homogeneity of variance was conducted for the ANOVA investigating the relationship between cluster membership and depression, and was significant (F (2,464) = 4.24, p < 0.05), indicating heterogeneity of variance for the clusters on each variable. Due to the violation of that assumption, Welch's test was conducted, and was significant (F (2,277.10) = 176.09, p < .05, $\omega^2 = 0.43$) as shown in Table 6. Post hoc analyses were conducted using Games-Howell, and indicated significant differences between all three clusters as shown in Table 7. Participants in Cluster 1 ($M = 12.35$, $SD = 5.38$) had significantly lower depression scores compared to participants in Cluster 2 ($M = 24.71$, $SD = 10.01$). Participants in Cluster 3 ($M = 10.24$, $SD = 5.80$) had significantly lower levels of depression compared to both Cluster 1 and Cluster 2.

   Levene's test was also significant for the one-way ANOVA examining the relationship between trait anxiety and cluster membership (F (2, 464) = 4.24, p < .05), indicating heterogeneity of variance between the clusters. Welch's test was conducted, and showed that clusters differed on the basis of anxiety (F (2, 263.14) = 218.60, p < .05, $\omega^2 = 0.48$). Post hoc analyses were conducted using Games-Howell, and indicated significant differences between the three clusters, as shown in

Table 8. Participants in Cluster 1 ($M = 37.43$, $SD = 7.55$) had significantly lower trait anxiety scores compared to participants in Cluster 2 ($M = 541.27$, $SD = 8.82$). Participants in Cluster 3 ($M = 34.69$, $SD = 6.90$) had significantly lower trait anxiety scores compared to both Cluster 1 and Cluster 2.

Levene's test was significant for the one-way ANOVA examining the relationship between life satisfaction and cluster membership (F (2, 464) = 6.79, p < .05). Welch's test was conducted and was significant (F (2, 255.85) = 148.80, p < .05, $\omega^2 = 0.39$). Post hoc analyses were conducted using Games-Howell, and indicated significant differences between the three clusters, as shown in Table 9. Participants in Cluster 1 ($M = 24.40$, $SD = 5.45$) had significantly higher life satisfaction scores compared to participants in Cluster 2 ($M = 17.83$, $SD = 5.78$). Participants in Cluster 3 ($M = 27.03$, $SD = 4.52$) had significantly higher life satisfaction scores compared to both Cluster 1 and Cluster 2.

Social capital. To characterize the clusters in terms of social capital three one-way ANOVAs were conducted examining online bonding capital, offline bridging capital, and offline bonding capital. In addition, one Kruskal-Wallis test was conducted examining online bridging capital, as that variable was transformed into ordinal level data due to an extreme skew. Levene's test was conducted to determine homogeneity of variance for the one-way ANOVA examining the relationship between online bonding capital and cluster membership, and was significant (F (2,464) = 3.78, p < 0.05). Due to the assumption of homogeneity of variance being violated, Welch's test was conducted, and was significant (F (2, 251.73) = 36.92, p < .05, $\omega^2 = 0.13$). Games-Howell post hoc analyses were conducted and indicated that participants in Cluster 3 ($M = 19.23$, $SD = 5.72$) had a significantly lower amount of online bonding capital compared to both

Cluster 2 ($M = 24.05$, $SD = 7.59$) and Cluster 1 ($M = 26.25$, $SD = 8.19$), as shown in Table 10. Participants in Clusters 1 and 2 did not differ significantly in their level of online bonding capital.

For the one-way ANOVA investigating the relationship between cluster membership and offline bonding capital, Levene's test of homogeneity of variance was not significant, indicating homogeneity of variance between clusters. The one-way ANOVA was significant ($F(2, 464) = 31.04$, $p < .05$, $\eta^2 = 0.12$) indicating that clusters differed on the basis of offline bonding capital, as shown in Table 11. Post-hoc analyses were conducted using Tukey's HSD, and indicated that participants in Cluster 2 ($M = 37.75$, $SD = 7.24$) had significantly lower levels of offline bonding capital compared to participants in Cluster 1 ($M = 42.69$, $SD = 6.61$) and Cluster 3 ($M = 42.39$, $SD = 7.06$), as shown in Table 12. Cluster 1 and Cluster 2 did not differ significantly in their level of offline bonding capital.

For the one-way ANOVA investigating the relationship between cluster membership and offline bridging capital, Levene's test of homogeneity of variance was significant ($F (2,464) = 8.25$, $p < 0.05$), indicating heterogeneity of variance between clusters. Welch's test was significant ($F(2, 252.96) = 24.91$, $p < .05$, $\omega^2 = 0.09$) indicating that clusters differed on the basis of offline bridging capital. Post-hoc analyses were conducted using Games-Howell, and indicated that participants in Cluster 2 ($M = 37.28$, $SD = 6.94$) had significantly lower levels of offline bridging capital compared to participants in Cluster 1 ($M = 41.15$, $SD = 5.24$) and Cluster 3 ($M = 41.36$, $SD = 7.68$), as shown in Table 13. Cluster 1 and Cluster 2 did not differ significantly in their level of offline bridging capital.

The Kruskal-Wallis test examining the relationship between online bridging capital and cluster membership was significant ($\chi^2 (2, N = 467) = 63.55$, $p < 0.05$, $\eta^2 = 0.14$), indicating that online bridging capital was not equally distributed across clusters, as shown in Table 14. Post-hoc

analyses were performed with a Bonferroni adjustment to control for Type I error. The pairwise comparisons indicated that Cluster 3 ($M = 26.16$, $SD = 10.30$) had a significantly lower mean rank of reflected online bridging capital compared to both Cluster 1 ($M = 36.23$, $SD = 9.57$) and Cluster 2 ($M = 32.08$, $SD = 10.38$), as shown in Table 15. Cluster 1 had a significantly higher mean rank compared to Cluster 2.

Game involvement. To characterize the clusters in terms of game involvement, two Kruskal-Wallis tests were conducted examining the number of gaming hours per week, and social identification as a gamer, and a Chi-square test of independence was conducted for game preference. The Kruskal-Wallis test examining the relationship between cluster membership and gaming hours per week was significant (χ^2 (2, N =467) = 70.53, p < 0.05, η^2 = 0.18), indicating that the ranked gaming hours per week was not equally distributed across clusters, as shown in Table 16. Post-hoc analyses were performed with a Bonferroni adjustment to control Type I error. These analyses indicated that Cluster 1 ($M = 8.05$, $SD = 7.18$) had a significantly higher rank order of gaming hours per week compared to both Cluster 2 ($M = 4.11$, $SD = 6.72$) and Cluster 3 ($M = 1.58$, $SD = 2.21$), as shown in Table 17 . Cluster 2 had a higher rank order compared to Cluster 3. The Kruskal-Wallis test examining the relationship between cluster membership and social identification as a gamer was also significant (χ^2 (2, N = 191) = 76.23, p < .05, η^2 = 0.25), indicating that the ranked social identification as a gamer was not equally distributed across clusters, as shown in Table 18. Post-hoc analyses were performed with a Bonferroni adjustment to control Type I error. These analyses indicated that Cluster 1 ($M = 19.24$, $SD = 6.25$) had a significantly higher rank order of social identification as a gamer compared to both Cluster 2 ($M = 13.25$, $SD = 7.23$) and Cluster 3 ($M = 8.94$, $SD = 4.57$), as shown in Table 19. Cluster 2 also had a significantly higher rank order compared to Cluster 3. The chi-square analysis examining the

relationship between cluster membership and game preference was significant ($\chi^2(24, N = 467) = 96.38$, $p < 0.05$, Cramer's V = 0.32). Table 19 displays the differences in game preference between the clusters.

PVGP. A Kruskal-Wallis test was performed to examine the relationship between PVGP and cluster membership. The test was significant ($\chi^2 (2) = 64.97$, p < 0.05, $\eta^2 = 0.14$), as shown in Table 21. Cluster 1($M = 38.60$, $SD = 10.34$) had a significantly higher mean rank compared to Cluster 2 ($M = 34$, $SD = 12.67$) and Cluster 3($M = 25.77$, $SD = 6.29$), as shown in Table 22. Cluster 2 had a significantly higher mean rank compared to Cluster 3.

To summarize, the clusters seem to represent a high risk, medium risk, and low risk group. The cluster with the highest level of PVGP appears to be characterized by moderate levels of depression and anxiety; moderate levels of life satisfaction; greater amount of time spent gaming per week; high social identity as a gamer; and relatively higher levels of both online and offline bridging and bonding capital; as well as having no members in moratorium. As such, this cluster will now be referred to as the High Functioning/High Gaming (HF/HG) cluster. Cluster 2 appears to be characterized by higher levels of depression and anxiety; lower levels of life satisfaction; a moderate amount of time spent gaming and social identity as a gamer; moderate levels of PVGP; lower levels of offline bonding and bridging capital, and moderate levels of online bonding and bridging capital; and having a disproportionate amount of members in moratorium. Based on these characteristics, Cluster 2 will now be referred to as the Low Functioning/Moderate Gaming (LF/MG) cluster. Cluster 3 appears to have lower levels of anxiety and depression; high levels of life satisfaction; having less time spent gaming and being less likely to identify as a gamer; having lower levels of PVGP; and having high levels of offline bonding and bridging capital, but lower

levels of online bonding and bridging capital. Cluster 3 will be referred to as the High Functioning/Low Gaming (HF/LG) cluster.

Hypothesis 2

It is expected that motivation for play will vary as a function of PVGP risk such that individuals in the higher risk cluster will exhibit higher levels of need satisfaction from video game play, than those in the medium or low risk clusters. Due to the high risk cluster not having the characteristics that were hypothesized, and the low number of participants indicating need satisfaction from gaming, this hypothesis was addressed with six analyses: an ordinal regression was conducted with need satisfaction from gaming predicting PVGP instead of cluster membership, and five one-way ANOVAs examining the relationship of cluster membership and overall satisfaction on each need. For the ordinal regression of need satisfaction from gaming predicting PVGP, the full model of dichotomized percentage of need satisfaction from video game playing for all 5 needs predicting PVGP was statistically significant (χ^2 (5) = 182.90, p < 0.05, Nagelkerke r^2 = 0.45), as shown in Table 23. Participants who did not attribute satisfaction of physical, and safety needs to video game playing had a decrease in likelihood of PVGP.

For the ANOVA examining the relationship between cluster membership and satisfaction of physiological needs, Levine's test of homogeneity of variance was not significant (F (2,464) = 0.65, p < 0.05). The results of the ANOVA indicate that Cluster membership was related to level of satisfaction with physiological needs (F (2,464) = 54.20, p < 0.05, η^2 = 0.19), as shown in Table 24. Post hoc analyses were conducted with Tukey's HSD, and showed that participants in the LF/MG cluster (M = 3.13, SD = 0.53) had significantly lower levels of satisfaction with physiological needs compared to participants in the HF/HG cluster (M = 3.63, SD = 0.53) and the

HF/LG cluster ($M = 3.70$, $SD = 0.55$), as shown in Table 25. Participants in the HF/HG and HF/LG clusters did not differ on their level of satisfaction with physiological needs.

The ANOVA examining the relationship between cluster membership and safety needs was significant (F (2,464) = 36.76, p < 0.05, $\eta^2 = 0.14$), as shown in Table 26. Levene's test of homogeneity of variance was not significant (F (2,464) = 1.32, p < 0.05) Post hoc analyses were conducted with Tukey's HSD, and indicated that participants in the LF/MG cluster ($M = 3.30$, $SD = 0.62$) had significantly lower levels of satisfaction with safety needs compared to participants in the HF/HG cluster ($M = 3.84$, $SD = 0.54$) and the HF/LG cluster ($M = 3.72$, $SD = 0.60$), as shown in Table 27. Participants in HF/HG and HF/LG clusters did not differ on their level of satisfaction with safety needs.

For the ANOVA examining the relationship between cluster membership and satisfaction of belongingness needs, Levine's test of homogeneity of variance was not significant (F (2,464) = 0.95, p < 0.05). The results of the ANOVA indicate that Cluster membership was related to level of satisfaction with belongingness needs (F (2,464) = 54.20, p < 0.05, $\eta^2 = 0.19$), as shown in Table 28. Post hoc analyses were conducted with Tukey's HSD, and showed that participants in the LF/MG cluster ($M = 3.50$, $SD = 0.54$) had significantly lower levels of satisfaction with belongingness needs compared to participants in the HF/HG cluster ($M = 4.09$, $SD = 0.45$) and the HF/LG cluster ($M = 4.12$, $SD = 0.54$), as shown in Table 29. Participants in the HF/HG and HF/LG clusters did not differ on their level of satisfaction with belongingness needs.

For the ANOVA examining the relationship between cluster membership and satisfaction of esteem needs, Levine's test of homogeneity of variance was not significant (F (2,464) = 1.63, p < 0.05). The results of the ANOVA indicate that Cluster membership was related to level of satisfaction with esteem needs (F (2,464) = 76.33, p < 0.05, $\eta^2 = 0.25$), as shown in Table 30. Post

hoc analyses were conducted with Tukey's HSD, and showed that participants in the LF/MG cluster ($M = 3.36$, $SD = 0.70$) had significantly lower levels of satisfaction with esteem needs compared to participants in the HF/HG cluster ($M = 4.01$, $SD = 0.55$) and the HF/LG clusters ($M = 4.12$, $SD = 0.54$), as shown in Table 31. Participants in the HF/HG and HF/LG clusters did not differ on their level of satisfaction with esteem needs.

For the ANOVA examining the relationship between cluster membership and satisfaction of self-actualization needs, Levine's test of homogeneity of variance was not significant (F (2,464) $= 0.65$, p < 0.05). The results of the ANOVA indicate that Cluster membership was related to level of satisfaction with self-actualization needs (F (2,464) $= 54.20$, p < 0.05, $\eta^2 = 0.19$), as shown in Table 32. Post hoc analyses were conducted with Tukey's HSD, and showed that participants in the LF/MG cluster ($M = 3.13$, $SD = 0.53$) had significantly lower levels of satisfaction with self-actualization needs compared to participants in the HF/HG cluster ($M = 3.63$, $SD = 0.53$) and the HF/LG cluster ($M = 3.70$, $SD = 0.55$), as shown in Table 33. Participants in the HF/HG and HF/LG clusters did not differ on their level of satisfaction with self-actualization needs.

Hypothesis 3

It is expected that individuals in the high risk cluster will exhibit higher levels of escapism than those in other clusters. The Kruskal-Wallis examining the relationship between escapism and cluster membership was significant (χ^2 (2, N = 456) = 69.04, p < 0.05, $\eta^2 = 0.15$), as shown in Table 34, indicating that escapism was not normally distributed across clusters. Post-hoc tests were conducted and adjusted using the Bonferroni method. The HF/LG cluster ($M = 3.80$, $SD = 1.51$) had a lower rank order of escapism when compared to HF/HG cluster ($M = 5.90$, $SD = 2.53$), and the LF/MG cluster ($M = 5.79$, $SD = 3.03$) and the, as shown in Table 35. The LF/MG cluster and HF/HG cluster did not significantly differ.

Hypothesis 4

It is expected that lower levels of satisfaction with physiological and safety needs will be related to higher levels of escapism. To test the fourth hypothesis, an ordinal regression was conducted with overall satisfaction of physiological needs and safety needs predicting escapism. The overall model of physiological needs satisfaction and safety needs satisfaction predicting escape was statistically significant (χ^2 (5) = 13.60, p < 0.05, Nagelkerke r^2 = 0.03), as shown in Table 36. As satisfaction with physiological needs increases, the odds of having a higher score on escapism decreased significantly 0.57 (95% CI, 0.40 to 0.81), Wald χ^2(1) = 10.01, *p* < .05. Safety needs was not a significant predictor in the model.

CHAPTER 4 DISCUSSION

This study investigated PVGP risk and motivation for play in emerging adult college students. In terms of motivation, it was found that individuals who derived satisfaction for their higher order needs from video game play had an increased likelihood of video game related problems. Further, individuals who were less satisfied with physiological needs were more likely to play video games as a means of escape. Utilizing a person-centered approach to further elucidate how psychological adjustment, social capital, identity status and video game involvement come together within individuals and relate to PVGP risk, 3 clusters emerged, as hypothesized, representing different levels of PVGP risk: a High Functioning High Gaming cluster, a Low Functioning Moderate Gaming cluster, and a High Functioning Low Gaming cluster.

The HF/HG cluster was characterized by having higher online and offline social capital; moderate levels of depression, anxiety and life satisfaction; a greater level of identification as a gamer, and more hours per week spent gaming compared to other groups. With regards to identity status, individuals in the HF/HG cluster were largely in diffusion, with a small amount of cluster members in foreclosure. Individuals in the HF/HG cluster had higher levels of PVGP compared to individuals in the other clusters, and were more likely to play as a means of escape. Additionally, individuals in the HF/HG cluster had high levels of overall satisfaction on each of the five needs.

The LF/MG cluster was characterized by having higher online social capital, but lower levels of offline social capital; higher levels of depression and anxiety; lower levels of life satisfaction; moderate identification as a gamer, and a moderate amount of hours spent gaming per week. Similar to the HF/HG cluster, many of the cluster members were in identity diffusion, though there were a small group in identity foreclosure, and a group in moratorium. Individuals in this cluster had moderate levels of PVGP and escapism relative to other clusters. In terms of overall

needs satisfaction, members of the LF/MG cluster had the lowest rate of overall basic need satisfaction when compared to the other two clusters.

The HF/LG cluster was characterized by having high levels of offline capital, and lower levels of online capital; lower levels of depression and anxiety; high levels of life satisfaction; low identification as a gamer, and less hours per week spent gaming. Similar to the LF/MG cluster, a large portion of cluster members were in identity diffusion, with smaller amount of individuals in identity foreclosure and moratorium. Individuals in this cluster had the lowest levels of PVGP, and escapism. Similar to the HF/HG cluster, individuals in this cluster had high levels of overall satisfaction with the five basic needs.

Though a high PVGP risk cluster with low levels of psychological adjustment, social capital, and overall needs satisfaction was proposed, this cluster did not appear in the sample. This may be due to sample bias. The sample was restricted to emerging adults attending a large, urban university. Individuals who are the most at risk for PVGP may be so at risk that they are unable to attend college, either due to excessive video game use, or other demographic factors. The two PVGP risk groups that did emerge in the sample differed from the risk groups that were proposed. Despite having higher levels of PVGP and time spent gaming, individuals in the HF/HG cluster had higher levels of psychological adjustment, social capital, and overall needs satisfaction compared to the LF/MG group. This seems to contradict previous research finding PVGP to be associated with higher levels of depression and anxiety, and lower levels of life satisfaction (Gentile et. al, 2011; Mehroof, & Griffiths, 2010; Mentzoni et al., 2011). Further, though the individuals in the HF/HG cluster spent more time gaming, and had higher levels of PVGP compared to the LF/MG cluster, they were no more likely to develop video game addiction. According to recent research, though the GAS (used to measure PVGP in this study) is a commonly

used measure, it may be measuring both game engagement, and PVGP (Brunborg, Hanss, Mentzoni, & Pallesen, 2015). Though engagement and PVGP are certainly related, an individual could have high levels of engagement without experiencing a high level of game-related problems. Thus, though the HF/HG group has a higher score on PVGP, the score may be more indicative of higher levels of engagement with video games, opposed to higher levels of problems with video games.

Alternatively, the difference in anxiety and depression seen between the HF/HG and LF/MG clusters is consistent with experimental investigations that found a reduction in both depression and anxiety (Patel et al., 2006, Valadez & Ferguson, 2012) from video game play. These findings could suggest that individuals in the HF/HG cluster may be using video games as a means of emotion regulation. To further support this assertion, individuals in the HF/HG cluster were more likely than individuals in the LF/MG cluster to play as a means of escape. Similarly, a recent study investigating the relationship between PVGP and both depression and anxiety found that coping skills completely mediated the relationship between video game engagement and psychological adjustment (Loton, Borkoles, Lubman, & Polman, 2015). Individuals with high video game engagement were more likely to use withdrawal and resignation coping strategies than approach strategies. Though withdrawal and resignation strategies are typically seen as being less effective compared to approach strategies, they were effective at reducing depression and anxiety for those who were highly engaged in video games. Interestingly, the withdrawal and resignation strategies were ineffective for those who met the criteria for addiction.

Previous research found PVGP to be related to higher levels of online social capital, and lower levels of offline capital (Collins & Freeman, 2013). Similarly, this study found that the LF/MG cluster had high levels of online bonding capital, and the lowest levels of offline social

capital and online bridging capital of the three clusters. Interestingly though, this cluster only had moderate levels of PVGP. The HF/HG cluster, with the highest level of PVGP, had high levels of both online and offline social capital. The different levels of social capital between these two groups may also relate to the aforementioned differences in psychological adjustment. Research has shown that individuals with higher levels of social capital less likely to develop major depression, and have lower levels of anxiety than individuals with lower levels of social capital (De Silva, Huttly, Harpham, & Kenward, 2007; Fujiwara & Kawachi, 2008). Thus it could be the case that the additional social capital individuals in the HF/HG cluster had provided them some resilience. Future research should investigate how coping skills and social capital influence the relationship between PVGP and psychological adjustment.

Though it was hypothesized that escapism would vary as a function of physiological and safety needs satisfaction, only physiological needs was a significant predictor. Individuals were more likely to play for escape when they were less satisfied with their basic physiological needs. Interestingly, safety needs was not a significant predictor in the model as hypothesized. Some of the items on the safety needs scale were focused on war, terrorism, and natural disasters. Perhaps these are not as concerning for college students living in a metropolitan area in the U.S.A that rarely sees natural disasters. For future studies, a version of this scale revised for college students to include date rape, campus shootings, and other safety concerns more relevant to a college population, may yield different results.

The emerging adult period can be seen as a prolonged transition to adulthood, and one of the main features of this period is identity exploration (Arnett, 2000). Because identity formation coincides with the successful transition to adulthood, there has been some concern that time spent gaming during this period could have a negative impact on identity development by distracting

emerging adults from identity exploration (Padilla-Walker et al., 2010). This study found that there does appear to be a relationship between identity status and PVGP. While the fact that the HFHG group did not have any members in moratorium could suggest that PVGP disrupts identity exploration, the level of identity formation in this group may not be unusual for the typical emerging adult. The mean age for this sample was 20.63, and approximately 43% of the sample was under the age of twenty. Côté (2006) found that for some individuals, moratorium continued into the late twenties, with gains in identity formation being made in the early twenties. For many individuals in the sample it may be too early for serious consideration of identity, which may not be detrimental to their ability to achieve an identity and transition into adult roles. Research examining the relationship of the timing of transition to adulthood to identity formation found that though individuals who adopt adult roles in their early twenties had strong identity development by age twenty, those who transitioned into adult roles later, and those who perceived themselves as being adult at age 27, had strong identity formation at 36 and 43 (Fadjukoff, Kokko, & Pulkinnen, 2007). Interestingly though, the LFMG group had moderate levels of PVGP and the highest percentage of group members in moratorium, which could suggest the opposite: that the identity formation process, and transition to adulthood, is influencing PVGP. This would be consistent with the research of Ream et al. (2013) who found that PVGP decreased over the course of emerging adulthood, and theorized that taking on more adult roles was leading to the reduction in PVGP. Future research should aim to investigate this complex relationship, utilizing longitudinal modeling to examine the trajectories of identity formation and transition to adult roles in relation to PVGP.

This study found a smaller percentage of emerging adults who play games compared to previous estimates (Lenhart et. al, 2008). This could be due to differing perceptions on what is considered a video game; some individuals may only associate the term video game with console and PC gaming, and may not consider phone or tablet applications to be in the same category. This difference could also be due to sample bias, as the sample was limited to college students. Of those who did play, many indicated an average weekly play time of 0 hours. It may be the case that determining a weekly average for play time is difficult due to the fluctuation of gaming time that coincides with new game releases; individuals may play a lot more when new games are released, and much less or not at all in the interim.

One major limitation of this study was the immense amount of missing data. Approximately 47% of the sample was missing data on variables included in the cluster analysis. Though Little's test indicated the data were missing completely at random, it appeared from examination of common missing test items that there may be patterns in the missing data. As previously mentioned, some of the most commonly missed items pertained to relationships, which could indicate that the individuals missing data on those variables were not in relationships. Given that the potential impact of video game playing on relationships is a characteristic of PVGP, deletion of individuals with missing data could bias the results, potentially excluding individuals in the target population and limiting generalizability. Because of this, the data were imputed using the EM algorithm. However, there is a major drawback to using this method; EM estimated means and variances fit the data well, but the standard deviation is underestimated, which results in the overestimation of relationships between variables (Kang, 2013). Thus caution should be used when interpreting the findings of this study.

Though variable centered approaches have pinpointed psychological adjustment, social capital, and game involvement as risk factors of PVGP, a somewhat different picture emerges when a person-centered approach is used. The most surprising difference is that there appears to be a cluster of emerging adult college students who, despite spending a relatively large amount of time gaming and having more game-related problems compared to the other groups, seem to be doing ok. Though variable-centered research suggests that individuals with high levels PVGP have lower levels of social capital and have lower levels of psychological adjustment, these individuals appear to have somewhat effective coping strategies, and people in their lives, both online and offline, who they feel they can count on for support. This study also found that individuals seem to use video games as a means of satisfying needs, though individuals who were less satisfied with their physiological needs appear to use video games as a means of escapism as well. Future research should further investigate this demographic to better understand the nature of this resilience. Additionally, it would be interesting to pursue a longitudinal investigation with a person-centered approach to see how these different groups of emerging adults transition into adulthood.

APPENDIX A

Background Questionnaire

Please respond to the following questions (where applicable):

1) Age (in years): _____

2)Sex:
       ☐ ___Female   ☐ ___Male

3) Which of the following best describes your ethnicity?
- African American
- Asian-American
- Caucasian
- Hispanic
- Middle Eastern
- Native American
- Pacific Islander
- Other (please specify)_____
- Multiracial (please specify)_____

4) What is your current GPA? _____

5) Who do you live with (check all that apply)?
___ Alone
___Parent/Parents
___Grandparents
___Siblings
___Roommate
___Friend
___Romantic partner
___Spouse
___Other (please specify) _____

7) Are you employed?
      Occupation _____
         ___Part Time or ___Full Time

8) Which of the following best describes your marital status? (check one)
___ Single   ___Married   ___ Divorced
___Separated   ___Widowed   Other _____

APPENDIX B

Objective Measure of Ego Identity Status

Response Scale:

1 = strongly agree	4 = disagree
2 = moderately agree	5 = moderately disagree
3 = agree	6 = strongly disagree.

1. I haven't really considered politics. They just don't excite me much.
2. I might have thought about a lot of different things but there has never really been a decision since my parents said what they wanted.
3. When it comes to religion I just haven't found any that I'm really into myself.
4. My parents had it decided a long time ago what I should go into and I'm following their plans.
5. There are so many different political parties and ideals. I can't decide which to follow until I figure it all out.
6. I don't give religion much thought and it doesn't bother me one way or the other.
7. I guess I'm pretty much like my folks when it comes to politics. I follow what they do in terms of voting and such.
8. I haven't chosen the occupation I really want to get into, but I'm working toward becoming a _____ until something better comes along.
9. A person's faith is unique to each individual. I've considered and reconsidered it myself and know what I can believe.
10. It took me a long time to decide but now I know for sure what direction to move in for a career.
11. I really never was involved in politics enough to have to make a firm stand one way or the other.
12. I'm not so sure what religion means to me. I'd like to make up my mind but I'm not done looking yet.
13. I've thought my political beliefs through and realize I may or may not agree with many of my parent's beliefs.
14. It took me awhile to figure it out, but now I really know what I want for a career.
15. Religion is confusing to me right now. I keep changing my views on what is right and wrong to me.
16. I'm sure it will be pretty easy for me to change my occupational goals when something better comes along.
17. My folks have always had their own political and moral beliefs about issues like abortion and mercy killing and I've always gone along accepting what they have.
18. I've gone through a period of serious questioning about faith and can now say I understand what I believe in as an individual.
19. I'm not sure about my political beliefs, but I'm trying to figure out what I can truly believe in.
20. I just can't decide how capable I am as a person and what jobs I'll be right for.
21. I attend the same church as my family has always attended. I've never really questioned why.
22. I just can't decide what to do for an occupation. There are so many possibilities.
23. I've never really questioned my religion. If it's right for my parents it must be right for me.
24. Politics are something that I can never be too sure about because things change so fast. But I do think it's important to know what I believe in.

APPENDIX C

How many hours per week do you spend playing video games on average?

Which of the following is your preferred type of video game?
- o Action Adventure
- o MMORPG
- o RPG
- o FPS
- o Other Shooter
- o RTS
- o Other strategy
- o Board/Card Games
- o Sports
- o Puzzle
- o Rhythm
- o Driving
- o Platformer

Do you prefer to play single-player, co-op, or online? Single-player refers to playing the game completely by yourself with no other people playing with you in-person or online. Co-op refers to playing a video game with friends in person. Online refers to playing a game with other people online.

Please indicate with this scale the extent to which you agree with the following statements:
1 – Strongly Disagree
2 – Disagree
3 – Somewhat Disagree
4 – Neither Agree nor Disagree
5 – Somewhat Agree
6 – Agree
7 – Strongly Agree

1. I see myself as a gamer.
2. I am pleased to be a gamer.
3. I identify with other gamers.
4. I feel strong ties with other gamers.

APPENDIX D

Internet Social Capital Scales

Directions: The following 20 questions are concerned with people you interact with **offline**, or in other words, in person. Using the provided scale, indicate the extent to which you agree with the following statements.

Scale:
1 – Strongly Agree
2 – Agree
3 – Neither Agree nor Disagree
4 – Disagree
5 – Strongly Disagree

Offline Bonding Subscale

1. There are several people offline I trust to help solve my problems.
2. There is someone offline I can turn to for advice about making very important decisions.
3. There is no one offline that I feel comfortable talking to about intimate personal problems.
4. When I feel lonely, there are several people offline I can talk to.
5. If I needed an emergency loan of $500, I know someone offline I can turn to.
6. The people I interact with offline would put their reputation on the line for me.
7. The people I interact with offline would be good job references for me.
8. The people I interact with offline would share their last dollar with me.
9. I do not know people offline well enough to get them to do anything important.
10. The people I interact with offline would help me fight an injustice.

Offline Bridging Subscale

1. Interacting with people offline makes me interested in things that happen outside of my town.
2. Interacting with people offline makes me want to try new things.
3. Interacting with people offline makes me interested in what people unlike me are thinking.
4. Talking with people offline makes me curious about other places in the world.
5. Interacting with people offline makes me feel like part of a larger community.
6. Interacting with people offline makes me feel connected to the bigger picture.
7. Interacting with people offline reminds me that everyone in the world is connected.
8. I am willing to spend time to support general offline community activities.
9. Interacting with people offline gives me new people to talk to.
10. Offline, I come in contact with new people all the time.

Directions: The following 20 questions are concerned with people you interact with **online**. Using the provided scale, indicate the extent to which you agree with the following statements.

Scale:
1 – Strongly Agree
2 – Agree
3 – Neither Agree nor Disagree
4 – Disagree
5 – Strongly Disagree

Online Bonding Subscale

1. There are several people online I trust to help solve my problems.
2. There is someone online I can turn to for advice about making very important decisions.
3. There is no one online that I feel comfortable talking to about intimate personal problems.
4. When I feel lonely, there are several people online I can talk to.
5. If I needed an emergency loan of $500, I know someone online I can turn to.
6. The people I interact with online would put their reputation on the line for me.
7. The people I interact with online would be good job references for me.
8. The people I interact with online would share their last dollar with me.
9. I do not know people online well enough to get them to do anything important.
10. The people I interact with online would help me fight an injustice.

Online Bridging Subscale

1. Interacting with people online makes me interested in things that happen outside of my town.
2. Interacting with people online makes me want to try new things.
3. Interacting with people online makes me interested in what people unlike me are thinking.
4. Talking with people online makes me curious about other places in the world.
5. Interacting with people online makes me feel like part of a larger community.
6. Interacting with people online makes me feel connected to the bigger picture.
7. Interacting with people online reminds me that everyone in the world is connected.
8. I am willing to spend time to support general online community activities.
9. Interacting with people online gives me new people to talk to.
10. Online, I come in contact with new people all the time.

Center for Epidemiologic Studies Depression (CES-D)
Directions: Below is a list of some ways you may have felt or behaved. Please indicate how often you have felt this way during the last week on the provided scale. Please only provide one answer to each question.

Scale:
Some or a little of the time (1-2 days)
Occasionally or a moderate amount of time (3-4 days)
Most or all of the time (5-7 days)
Rarely or none of the time (less than 1 day)

1. I was bothered by things that usually don't bother me.
2. I did not feel like eating; my appetite was poor.
3 I felt that I could not shake off the blues even with help from my family or friends.
4. I felt I was just as good as other people.
5. I had trouble keeping my mind on what I was doing.
6. I felt depressed.
7. I felt that everything I did was an effort.
8. I felt hopeful about the future.
9. I thought my life had been a failure.
10. I felt fearful.
11. My sleep was restless.
12. I was happy.
13. I talked less than usual.
14. I felt lonely.
15. People were unfriendly.
16. I enjoyed life.
17. I had crying spells.
18. I felt sad.
19. I felt that people disliked me.
20. I could not get going

APPENDIX F

Trait Anxiety

Directions: A number of statements which people have used to describe themselves are given below. Read each statement, then select the appropriate answer to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

Scale:
1. Almost never
2. Sometimes
3. Often
4. Almost always

1. I feel pleasant
2. I feel nervous and restless
3. I feel satisfied with myself
4. I wish I could be as happy as others seem to be
5. I feel like a failure
6. I feel rested
7. I am "calm, cool, and collected"
8. I feel that difficulties are piling up so that I cannot overcome them
9. I worry too much over something that doesn't really matter
10. I am happy
11. I have disturbing thoughts
12. I lack self-confidence
13. I feel secure
14. I make decisions easily
15. I feel inadequate
16. I am content
17. Some unimportant thought runs through my mind and bothers me
18. I take disappointments so keenly that I can't put them out of my mind
19. I am a steady person
20. I get in a state of tension or turmoil as I think over my recent concerns and interests

The Satisfaction with Life Scale

Directions: Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

Scale:
1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree or Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

_____1. In most ways my life is close to my ideal.
_____2. The conditions of my life are excellent.
_____3. I am satisfied with life.
_____4. So far I have gotten the important things I want in life.
_____5. If I could live my life over, I would change almost nothing

Game Addiction Scale

Directions: Indicate on the provided scale how often in the *last 6 months* the following thoughts or behaviors have occurred.

Scale:

1 – Never

2 – Rarely

3 – Often

4 – Very often

How often during the last 6 months…

1. Did you think about playing a game all day long?

2. Did you spend much free time on video games?

3. Have you felt addicted to a game?

4. Did you play longer than intended?

5. Did you spend increasing amount of time on games?

6. Were you unable to stop once you started playing?

7. Did you play games to forget about real life?

8. Have you played games to release stress?

9. Have you played games to feel better/

10. Were you unable to reduce your game time?

11. Have others unsuccessfully tried to reduce your game time?

12. Have you failed when trying to reduce game time?

13. Have you felt bad when you were unable to play?

14. Have you become angry when unable to play?

15. Have you become stressed when unable to play?

16. Did you have fights with others (e.g. family, friends) over your time spent on games?

17. Have you neglected others (e.g. family, friends) because you were playing games?

18. Have you lied about time spent on games?

19. Has your time on games caused sleep deprivation?

20. Have you neglected other important activities (e.g. school, work, sports) to play games?

21. Did you feel bad after playing for a long time?

The Five Need Satisfaction Measures
Directions: For the following statements, indicate how much you agree or disagree with the statement "I am completely satisfied with" (the items in the list) on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*)

Physiological Needs Satisfaction Scale
1. The quality of the food I eat every day
2. The amount of food that I eat every day
3. The quality of the water I drink every day
4. The amount of water that I drink every day
5. The amount of heating I have when the weather is cold
6. The amount of cooling I have when the weather is hot
7. The quality of the air I breathe every day
8. The amount of sex I am having
9. The quality of sex I am having
10. Every aspect of my physical health
11. The amount of sleep I get to feel thoroughly relaxed
12. The quality of sleep I get to feel fully refreshed
13. The amount of exercise I get to keep me healthy
14. The type of exercise I get to keep my body toned
15. My overall physical strength

Safety–Security Needs Satisfaction Scale
1. The quality of the house/apartment I am living in
2. The space available for me in my house/apartment
3. How secure I am in my house/apartment
4. How safe I am from being physically attacked
5. The safety of my neighborhood
6. How safe I am from catching any diseases
7. How secure I am from disasters
8. How protected I am from dangers in the environment
9. The protection that the police provide for me
10. The protection that the law provides for me
11. How safe I am from destructive terrorist acts
12. How safe I am from acts of war
13. My financial security
14. My ability to get money whenever I need it
15. The money I reserved for me to have a secure retirement

Belongingness Needs Satisfaction Scale
1. The amount of rapport I share with the people I know
2. The quality of the relationships I have with my friends
3. The love I receive from my spouse/partner
4. The intimacy I share with my immediate family
5. The camaraderie I share with my colleagues

6. How much I am welcomed in my community
7. The warmth I share with my relatives
8. The emotional support I receive from my friends
9. The feeling of togetherness I have with my family
10. How much I am cared for by my spouse/partner
11. The happiness I share with my companions
12. The sympathy I receive from my confidants
13. The enjoyment I share with associates
14. The affection shown to me by my friends
15. The closeness I feel with my associates

Esteem Needs Satisfaction Scale
1. The admiration given to me by others
2. The honor that many people give me
3. How much other people respect me as a person
4. The prestige I have in the eyes of other people
5. How highly other people think of me
6. The high esteem that other people have for me
7. The recognition I receive from various people
8. The high regard that other people have for me
9. How much I like the person that I am
10. How sure I am of myself
11. How much respect I have for myself
12. All the good qualities I have as a person
13. My sense of self-worth
14. The amount of esteem I have for myself
15. How positive I feel about myself as a person

Self-Actualization Satisfaction Scale
For this measure, indicate how much you agree or disagree that the items describe you using a 5-point Likert scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*).

1. I am totally comfortable with all facets of my personality.
2. I feel that I am completely self-fulfilled.
3. I am now being the person I always wanted to be.
4. I am finally realizing all of my innermost desires.
5. I indulge myself as much as I want.
6. I am now enjoying everything I ever wanted from my life.
7. I completely accept all aspects of myself.
8. My actions are always according to my own values.
9. I am living my life the way I want.
10. I do the things I like to do whenever I want.
11. I am actually living up to all my capabilities.
12. I am living my life to the fullest.

Escapism

Directions: Answer the following questions with the provided scale.

Scale:

1 – Never
2 – Seldom
3 – Sometimes
4 – Often
5 – Always

Items:

1. How often do you play so you can avoid thinking about some of your real-life problems or worries?
2. How often do you play to avoid real-life social encounters or situations?
3. How often do you continue to play so that you won't have to deal with everyday problems and issues?

APPENDIX K

Table 1

Sample Demographics

Variable		Cluster 1 n (%)	Cluster 2 n (%)	Cluster 3 n (%)	Non-gamer n (%)	Total n(%)
Gender						
	Female	81 (80.20%)	141 (66.80%)	121 (78.10%)	186 (92%)	478 (71.60%)
	Male	20 (19.80%)	70 (33.20%)	34 (21.9%)	16 (7.90%)	190 (28.40%)
Ethnicity						
	African-American	16 (15.80%)	37 (17.50%)	28 (18.10%)	34 (16.80%)	115 (17.20%)
	Asian-American	10 (9.90%)	40 (19%)	18 (11.60%)	26 (12.90%)	94(14.10%)
	Caucasian	51 (50.50%)	79 (37.40%)	73 (47.10%)	57 (28.80%)	261 (39.10%)
	Hispanic	1 (1%)	8 (3.80%)	5 (3.20%)	8 (4%)	22 (3.30%)
	Middle Eastern	16 (15.80%)	25 (11.80%)	20 (12.90%)	57 (28.20%)	117 (17.50%
	Native American	0 (0%)	1 (0.50%)	1 (0.60%)	1 (0.50%)	3 (0.40%)

Pacific Islander	0 (0%)	1 (0.50%)	0 (0%)	0 (0%)	1 (0.10%)
Other	3 (3%)	7 (3.30%)	4 (2.6%)	10 (5%)	24 (3.60%)
Multiracial	4 (4%)	13 (6.20%)	6 (3.90%)	8 (4%)	31 (4.60%)
Marital Status					
Single	94 (93.10%)	196 (92.90%)	145 (93.50%)	183 (90.60%)	617 (92.40%)
Married	2 (2%)	1 (0.50%)	6 (3.90%)	5 (2.50%)	15 (2.20%)
Divorced	1 (1%)	0 (0%)	0 (0%)	0 (0%)	1 (0.10%)
Other	4 (4%)	14 (6.60%)	4 (2.60%)	13 (6.40%)	35 (5.20%)
Employment					
Full-time	63 (13.50%)	22 (10.80%)	19 (12.30%)	36 (17.80%)	85 (12.70%)
Part-time	59 (58.40%)	113 (55.40%)	91 (58.70%)	110 (55.60%)	380 (56.90%)
Unemployed	34 (33.70%)	69 (33.80%)	45 (29%)	55 (27.20%)	203 (30.40%)

Table 2

Mean Scores on IDEA Scales

Variable	Cluster 1			Cluster 2			Cluster 3			Non-gamer			Total		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Identity Exploration	96	3.31	0.43	196	3.32	0.46	143	3.37	0.40	190	3.31	0.45	628	3.33	0.44
Experimentation	99	3.40	0.46	203	3.32	0.53	153	3.42	0.42	197	3.33	0.48	655	3.36	0.48
Instability	96	2.92	0.47	198	3.19	0.44	149	2.93	0.49	193	3.07	0.49	639	3.05	0.48
Other-Focused	96	2.52	0.56	195	2.40	0.63	149	2.43	0.61	188	2.60	0.65	631	2.49	0.63
Self_Focused	93	3.35	0.34	200	3.24	0.46	151	3.37	0.38	188	3.33	0.42	635	3.31	0.42
"Feeling-in-Between"	100	3.25	0.52	205	3.25	0.56	151	3.19	0.55	193	3.22	0.53	652	3.23	0.54

Table 3

Percentage of missing values

Variable	Percent Missing
Anxiety	13%
Bonding Capital	
Offline	7.80%
Online	9.70%
Bridging Capital	
Offline	6.40%
Online	9.40%
Depression	13.30%
Escape	3.40%
Gamer ID	17.90%
Identity Status	34.00%
Needs Satisfaction	
Belongingness Needs	41.70%
Esteem Needs	10.20%
Physiological Needs	28.40%
Safety-Security Needs	14.50%
Self-Actualization Needs	7.90%
Satisfaction with Life	2.50%

Table 4

Descriptive Statistics

Variable		Non-gamers M	SD	SEM	Gamers M	SD	SEM
Age		20.86	3.01	0.21	20.47	2.40	0.11
Anxiety*		43.77	10.96	0.78	42.77	11.12	0.51
Bonding Capital							
	Offline*	39.06	8.05	0.57	40.36	7.42	0.35
	Online*	23.15	7.77	0.55	22.92	7.66	0.35
Bridging Capital							
	Offline*	38.68	9.07	0.64	39.53	7.16	0.33
	Online*	28.54	10.93	0.78	31.01	10.84	0.50
Depression*		17.35	10.82	0.77	17.23	10.45	0.48
Escape		3.44	1.51	0.11	5.15	2.68	0.13
Game playing hours per week*		--	--	--	4.12	6.20	0.29
Gamer Identification*		7.15	4.97	0.35	13.11	7.27	0.34
Need Satisfaction							
	Belongingness	3.87	0.66	0.05	3.85	0.59	0.03
	Esteem	3.73	0.76	0.05	3.75	0.71	0.03
	Physiological	3.48	0.56	0.04	3.43	0.62	0.03
	Safety	3.63	0.66	0.05	3.55	0.64	0.03
	Self-Actualization	3.40	0.77	0.05	3.30	0.77	0.04
PVGP		23.70	7.72	0.59	32.35	11.52	0.57
Satisfaction with Life*		22.52	6.75	0.48	22.30	6.76	0.31

*Included in cluster analysis

Table 6

Welch's Test for the Effect of Cluster Membership on Anxiety, Depression, Offline Bridging Capital, Online Bridging Capital and Satisfaction with Life

Variable	df Between	df Within	F	ω^2
Anxiety	2	263.4	218.60*	0.48
Depression	2	277.1	176.09*	0.43
Offline Bridging Capital	2	252.96	24.91*	0.09
Online Bonding Capital	2	251.73	36.92*	0.13
Satisfaction with Life	2	255.85	148.80*	0.31

* p < .05

Table 7

Games-Howell Post Hoc Pairwise Comparisons
for the Effect of Cluster Membership on Depression

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	-1.44*	0.11	-1.70	-1.17
Cluster 1 vs. Cluster 3	0.37*	0.12	0.09	0.65
Cluster 2 vs Cluster 3	1.8*	0.1	1.57	2.04

* $p < 0.05$

Table 8

Games-Howell Post Hoc Pairwise Comparisons
for the Effect of Cluster Membership on Anxiety

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	-13.84*	0.97	-16.12	-11.56
Cluster 1 vs. Cluster 3	2.74*	0.93	0.54	4.95
Cluster 2 vs Cluster 3	16.58*	0.82	14.65	18.52

* $p < 0.05$

Table 9

Games-Howell Post Hoc Pairwise Comparisons for the
Effect of Cluster Membership on Satisfaction with Life

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	6.57*	0.64	4.98	8.16
Cluster 1 vs. Cluster 3	-2.63*	0.68	-4.17	-1.09
Cluster 2 vs Cluster 3	-9.20*	0.56	-10.47	-7.93

* $p < 0.05$

Table 10

Games-Howell Post Hoc Pairwise Comparisons for the
Effect of Cluster Membership on Online Bonding Capital

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	0.22	0.1	-0.01	0.45
Cluster 1 vs. Cluster 3	0.73*	0.1	0.5	0.95
Cluster 2 vs Cluster 3	0.51*	0.08	0.33	0.68

* *p* < 0.05

Table 11

One-way Analysis of Variance for Offline Bonding Capital
by Cluster Membership

Source	df	SS	MS	F	η2
Between Groups	2	76.64	37.32	31.04*	0.12
Within Groups	464	557.85	1.2		
Total	466	632.49			

* $p < 0.05$

Table 12

Tukey's HSD Post Hoc Pairwise Comparisons for the Effect of
Cluster Membership on Offline Bonding Capital

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	-0.82*	0.13	-1.14	-0.51
Cluster 1 vs. Cluster 3	-0.04	0.14	-0.37	0.29
Cluster 2 vs Cluster 3	0.79*	0.12	0.52	1.06

* $p < 0.05$

Table 13

Games-Howell Post Hoc Pairwise Comparisons for the
Effect of Cluster Membership on Offline Bridging Capital

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	-0.64*	0.12	-0.92	-0.36
Cluster 1 vs. Cluster 3	0.08	0.14	-0.24	0.41
Cluster 2 vs Cluster 3	0.72*	0.12	0.44	1.00

* *p* < 0.05

Table 14

Kruskal-Wallis Test for Differences in Online Bridging Mean Rank by Cluster Membership

	Cluster 1	Cluster 2	Cluster 3
Mean Rank	294.78	251.6	170.44

χ^2 (2, N = 467) = 63.55, p < 0.05, η^2 = 0.14

Table 15

Kruskal-Wallis Pairwise Comparisons of Online Bridging Mean Rank by Cluster Membership

Comparison	t	SE
Cluster 1 vs. Cluster 2	43.16*	2.76
Cluster 1 vs. Cluster 3	124.33*	16.55
Cluster 2 vs. Cluster 3	81.17*	13.7

* $p < 0.05$

Table 16

Kruskal-Wallis Test for Differences in Weekly
Gaming Hours Mean Rank by Cluster Membership

	Cluster 1	Cluster 2	Cluster 3
Mean Rank	331.36	226.64	180.57

χ^2 (2, N =467) = 70.53, p < 0.05, η^2 = 0.18

Table 17

Kruskal-Wallis Pairwise Comparisons of Weekly Gaming Hours Mean Rank by Cluster Membership

Comparison	t	SE
Cluster 1 vs. Cluster 2	104.72*	15.72
Cluster 1 vs. Cluster 3	150.79*	16.61
Cluster 2 vs. Cluster 3	46.07*	13.74

*$p < 0.05$

Table 18

Kruskal-Wallis Test for Differences in Gamer ID Mean Rank by Cluster
Membership

	Cluster 1	Cluster 2	Cluster 3
Mean Rank	340.47	236.86	160.74

χ^2 (2, N = 191) = 76.23, p < .05, η^2 = 0.25

Table 19

Kruskal-Wallis Pairwise Comparisons of Gamer ID Mean Rank by Cluster Membership

Comparison	t	SE
Cluster 1 vs. Cluster 2	103.62*	15.91
Cluster 1 vs. Cluster 3	179.74*	16.82
Cluster 2 vs. Cluster 3	76.12*	13.91

*$p < 0.05$

Table 20

Crosstabulation for Game Preference by Cluster Membership

Game Type	Cluster 1 n (%)	Cluster 2 n (%)	Cluster 3 n (%)
Action-Adventure	27 (26.70%)	25 (11.80%)	10 (6.50%)
MMORPG	5 (5.00%)	6 (2.80%)	2 (1.30%)
RPG	20 (19.80%)	16 (7.60%)	8 (5.20%)
FPS	23 (22.8%)	21 (10.00%)	15 (9.70%)
RTS	2 (2.00%)	5 (2.40%)	1 (0.60%)
Other Strategy	1 (1.00%)	4 (1.90%)	0 (0%)
Board or Card Games	4 (4%)	17 (8.10%)	19 (12.30%)
Platformer	2 (2%)	19 (9%)	17 (11%)
Sports	12 (11.90%)	37 (17.50%)	20 (12.90%)
Puzzle	3 (16.20%)	35 (16.60%)	37 (23.90%)
Rhythm	0 (0%)	7 (3.30%)	10 (6.3%)
Driving	2 (2.0%)	13 (6.20%)	11 (7.10%)
Simulation	0 (0%)	6 (2.80%)	5 (3.20%)

$\chi^2(24) = 96.38$, *p* < 0.05, Cramer's V = 0.32

Table 21

Kruskal-Wallis Test for Differences in PVGP Mean Rank by Cluster Membership

	Cluster 1	Cluster 2	Cluster 3
Mean Rank	257.17	216.06	152.15

χ^2 (2) = 64.97, p < 0.05, η^2 = 0.14

Table 22

Kruskal-Wallis Pairwise Comparisons of PVGP Mean Rank
by Cluster Membership

Comparison	*t*	*SE*
Cluster 1 vs. Cluster 2	41.11*	12.73
Cluster 1 vs. Cluster 3	105.02*	13.5
Cluster 2 vs. Cluster 3	63.09*	11.35

*p < 0.05

Table 23

PLUM Ordinal Regression with Satisfaction of Needs from Gaming Predicting PVGP

Variables	Odds Ratio	Lower Bound	95% Confidence Interval	Upper Bound
Physiological Needs	0.18*	0.10		0.31
Safety Needs	0.46*	0.23		0.96
Belongingness Needs	0.64	0.29		1.39
Esteem Needs	0.40	0.16		1.01
Self-Actualization Needs	0.74	0.3		1.79

Full Model χ^2 (5) = 182.90, p < 0.05, Nagelkerke r^2 = 0.45

* p < 0.05

Table 24

One-way Analysis of Variance for Physiological Needs

Source	df	SS	MS	F	η^2
Between Groups	2	34.11	17.06	54.21*	0.19
Within Groups	464	145.99	0.32		
Total	466	180.1			

*$p < 0.05$

Table 25

Tukey's HSD Post Hoc Pairwise Comparisons for the Effect of Cluster Membership on Level of Satisfaction with Physiological Needs

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	0.50*	0.07	0.34	0.66
Cluster 1 vs. Cluster 3	-0.06	0.07	-0.23	0.11
Cluster 2 vs Cluster 3	-0.57	0.06	-0.71	-0.43

* $p < 0.05$

Table 26

One-way Analysis of Variance for Safety Needs by Cluster

Source	df	SS	MS	F	η²
Between Groups	2	26.47	13.24	36.76*	0.14
Within Groups	464	167.08	0.36		
Total	466	193.55			

* $p < 0.05$

Table 27

Tukey's HSD Post Hoc Pairwise Comparisons for the Effect of Cluster Membership on Level of Satisfaction of Safety Needs

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	0.54*	0.07	0.37	0.71
Cluster 1 vs. Cluster 3	0.12	0.08	-0.06	0.3
Cluster 2 vs Cluster 3	-0.42*	0.06	-0.57	-0.27

* $p < 0.05$

Table 28

One-way Analysis of Variance for Belongingness Need Satisfaction by Cluster Membership

Source	df	SS	MS	F	η2
Between Groups	2	5.40	2.7	91.88*	0.28
Within Groups	464	13.63	0.03		
Total	466	19.03			

* *p*< 0.05

Table 29

Tukey's HSD Post Hoc Pairwise Comparisons for the Effect of Cluster Membership
on Level of Satisfaction of Belongingness Needs

| Comparison | Mean Difference | *SEM* | 95% Confidence Interval | |
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	-0.20*	0.03	-0.25	-0.15
Cluster 1 vs. Cluster 3	0.03	0.02	-0.02	0.08
Cluster 2 vs Cluster 3	0.23*	0.02	0.18	0.27

* $p < 0.05$

Table 30

One-way Analysis of Variance for Esteem Needs by Cluster Membership

Source	df	SS	MS	F	η^2
Between Groups	2	6.61	3.3	76.33*	0.25
Within Groups	464	20.08	0.04		
Total	466	26.69			

* $p < 0.05$

Table 31

Tukey's HSD Post Hoc Pairwise Comparisons for the Effect of Cluster Membership on Level of Satisfaction with Esteem Needs

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	-0.21*	0.03	-0.27	-0.15
Cluster 1 vs. Cluster 3	0.04	0.03	-0.02	0.10
Cluster 2 vs Cluster 3	0.25*	0.03	0.2	0.3

* p < 0.05

Table 32

One-way Analysis of Variance for Self-Actualization Needs by Cluster Membership

Source	df	SS	MS	F	η^2
Between Groups	2	64.23	32.12	69.52	0.23
Within Groups	464	214.34	0.46		
Total	466	278.57			

$* p < 0.05$

Table 33

Tukey's HSD Post Hoc Pairwise Comparisons for the Effect of Cluster Membership on Level of Satisfaction of Self-Actualization Needs

Comparison	Mean Difference	*SEM*	95% Confidence Interval	
			Lower Bound	Upper Bound
Cluster 1 vs. Cluster 2	0.66*	0.08	0.47	0.86
Cluster 1 vs. Cluster 3	-0.13	0.09	-0.33	0.08
Cluster 2 vs Cluster 3	-0.79*	0.07	-0.96	-0.62

*$p < 0.05$

Table 34

Kruskal-Wallis Test for Differences in Escape Mean Rank
by Cluster Membership

	Cluster 1	Cluster 2	Cluster 3
Mean Rank	274.86	256.32	160.54

χ^2 (2, N =467) = 69.04, p < 0.05, η^2 = 0.15

Table 35

Kruskal-Wallis Pairwise Comparisons of Escape Mean Rank by Cluster Membership

Comparison	*t*	*SE*
Cluster 1 vs. Cluster 2	18.54	15.2
Cluster 1 vs. Cluster 3	114.31*	16.03
Cluster 2 vs. Cluster 3	95.78*	13.39

*$p < 0.05$

Table 36

PLUM Ordinal Regression with Physiological Needs and Safety Needs Predicting Escapism

Variables	Odds Ratio	95% Confidence Interval	
		Lower Bound	Upper Bound
Physiological Needs	0.57*	0.40	0.81
Safety Needs	1.09	0.78	1.52

Full Model $\chi 2$ (5) = 13.60, p < 0.05, Nagelkerke r^2 = 0.03

* *p* < 0.05

Figure 1

Employment Status for Gamers and Non-Gamers

Figure 2

Figure 2: Identity Status by Cluster

Figure 3

Sample Characteristics by Cluster
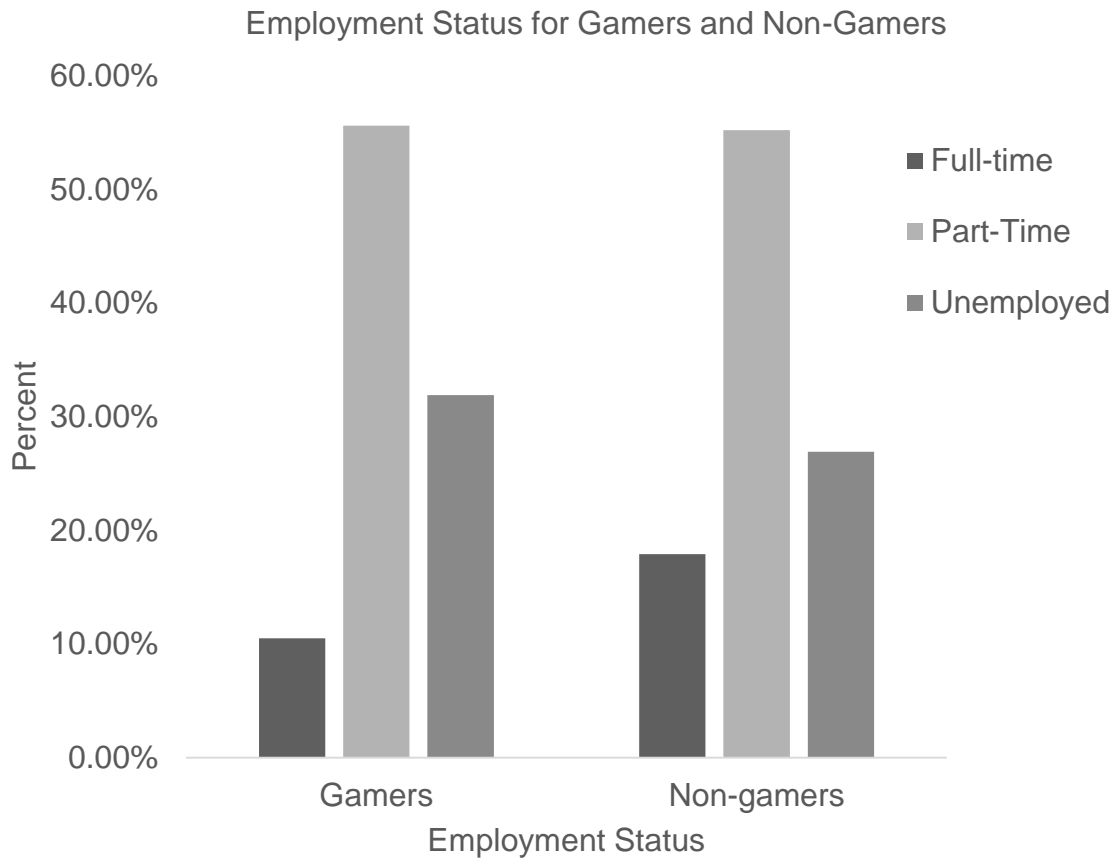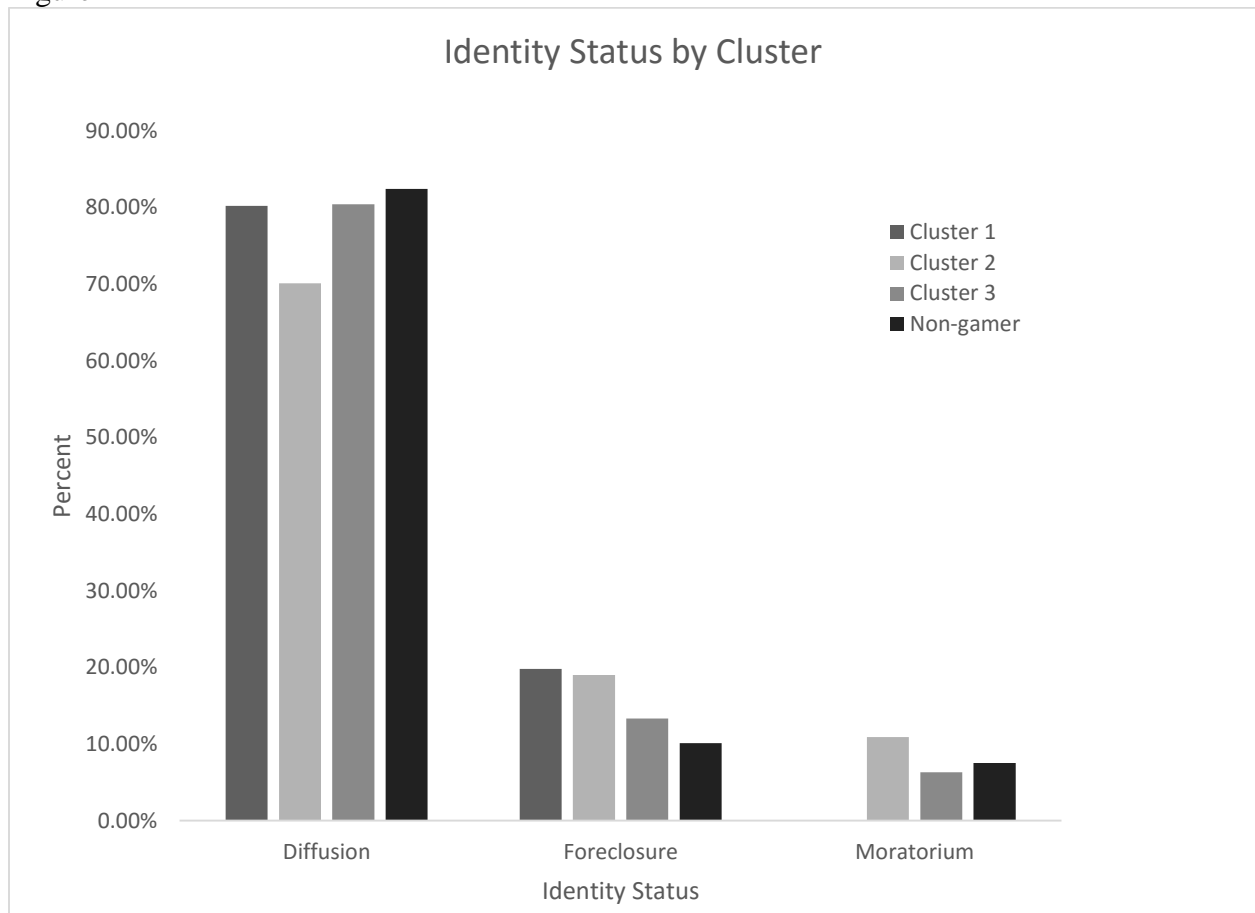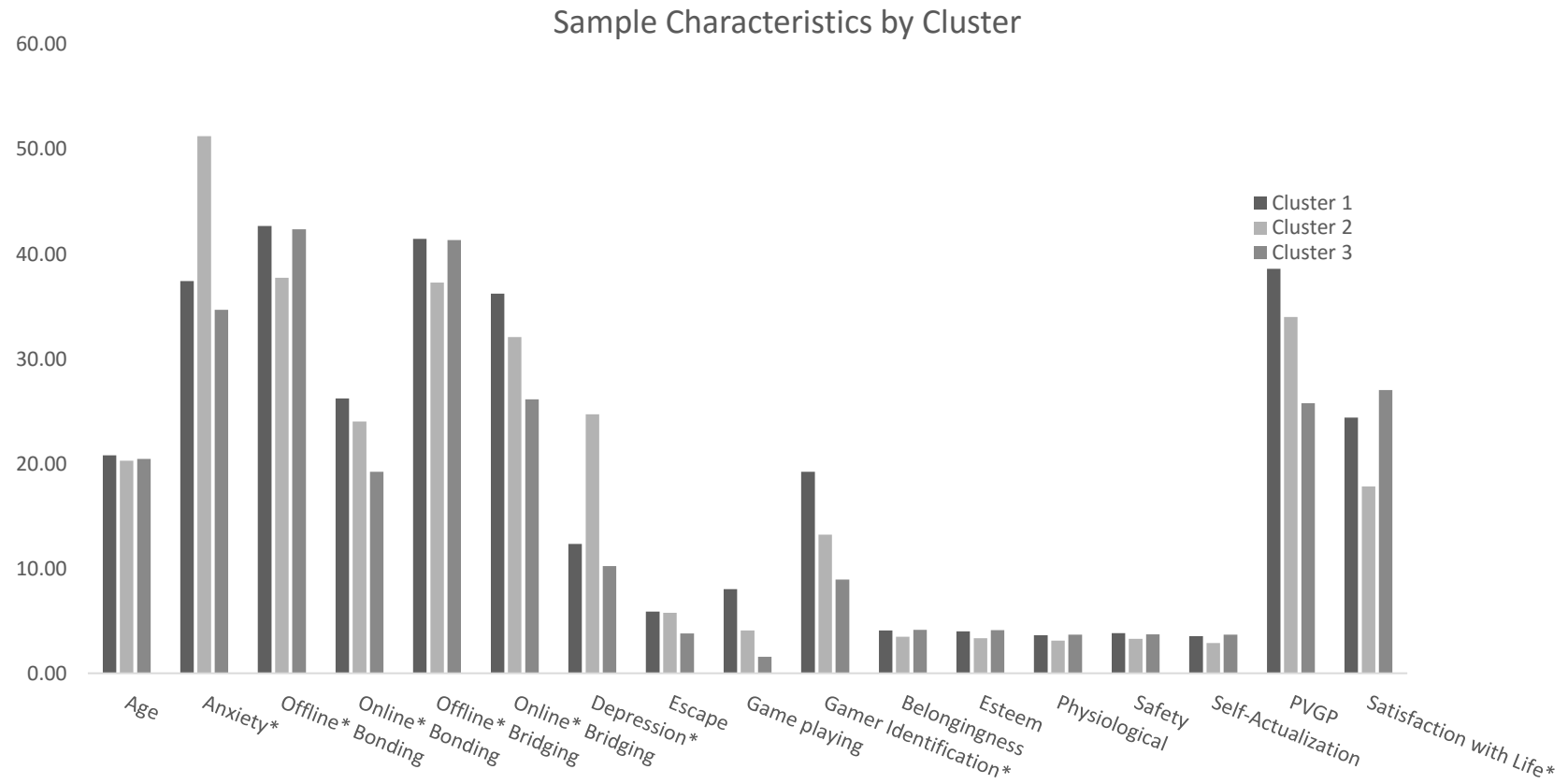
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ABSTRACT

VIDEO GAME PLAYING AND MOTIVATION IN EMERGING ADULTS: A PERSON CENTERED APPROACH

by

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Degree: Doctor of Philosophy

This study investigated risk for problem video game play (PVGP) and motivation for play in emerging adult college students. A sample of 700 undergraduate students were recruited to participate in an online survey. A person-centered approach was utilized to examine risk for PVGP, and found three clusters of individuals representing a High Functioning/High Gaming group, A Low Functioning/Moderate Gaming group, and a High Functioning/Low Gaming group. For motivation it was found that participants who derived satisfaction of higher order needs from video game play had an increased likelihood of PVGP. In addition, individuals who had lower satisfaction with physiological needs, were more likely to play video games as a means of escape.

AUTOBIOGRAPHICAL STATEMENT

I have been involved in research concerning developmental psychology for the past 9 years, and during that time I developed an interest in Emerging Adulthood, and am specifically interested in the characteristics and motivations of problem video game playing. During my graduate studies, I have been lucky enough to be awarded two prestigious fellowships: The Children's Bridge Fellowship and the Merrill Palmer Skillman Institute Pre-Doctoral Fellowship. As a part of my graduate school experience, I have taught courses at Wayne State University, Southern New Hampshire University, and Eastern Michigan University. I have found that I really enjoy teaching, and have a passion for helping students find their way to success both in and out of the classroom.