Video Gamers' Personas: A Five Factor Study Exploring Personality Elements of the Video Gamer

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VIDEO GAMERS' PERSONAS: A FIVE FACTOR STUDY EXPLORING PERSONALITY ELEMENTS OF THE VIDEO GAMER

A dissertation submitted

by

ANTHONY MARTIN BEAN

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ABSTRACT

Video Gamers' Personas:
A Five Factor Study Exploring Personality Elements of the Video Gamer
by

Anthony Martin Bean

This dissertation explored personality traits of video gamers utilizing the Big Five Inventory (BFI) totaling 19,416 video gamer participants across seven genres of video game play. The purpose was to uncover and explore personality differences among the different preferred genres of video gamers. Different personality profiles were explored by employing correlations, t-tests, and multivariate analysis of variances (MANOVAs). Mapping of the BFI personality traits of video gamers across video game genres was conducted using latent profile analysis (LPA) to identify video gamer personality profiles and personality formations across preferred genres of play, to examine the pattern of relationships among the variables, to compare the personality formations to a proposed antisocial personality pattern suggested by Markey and Markey (2010), and to determine whether different personalities gravitate to specific genres of play. Results found four distinct and statistically different personality profiles—Introversive, Extroversive, Secure Ambiversive, and Insecure Ambiversive—and indicated no support indicated for the different classification of video gamers possessing statistically different personality traits (i.e. causal, regular, hardcore). Different genres of video game play did have different personality types playing each genre, but personalities found did not fit into the criteria proposed by Markey and Markey (2010) of an antisocial personality (i.e. high neuroticism, low agreeableness, and low conscientiousness). As such, evidence is

provided for different personalities gravitating towards different genres of play and Carl Jung's (1923) idea of the introversion/extroversion continuum. Limitations observed were that some results became statistically significant with small effect sizes and the BFI possibly not being nuanced enough to detect smaller personality traits. Strengths were the large participant base, the generalizability of the study to the video gamer population, and the study providing a basis for personality playing a role in virtual worlds.

Keywords: Video Gamers, Video Games, Big Five Inventory, Personality, Introversion, Extroversion, Ambiversion, Video Game Aggression, Typology, Video Gamer Personality.

Dedication and Acknowledgments

This dissertation is dedicated to my wife, Holiday Bean, my family, and my fellow video gamers, without whom this work would not be possible. My wife continuously listened to me ramble about video gamers and showed interest while providing ideas and support. Thanks also to my family, without whom I would never have been able to understand the video game worlds or video gamers as well as I do. And to my fellow video gamers, who spent much of their time taking my research and passing it along to their friends, creating an audience of over 19,000 total video gamers. I thank you all.

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The style used throughout this dissertation is in accordance with the *Publication Manual of the American Psychological Association* (6th Edition, 2009), and *Pacifica Graduate Institute's Dissertation Handbook* (2014-2015).

Chapter 1

Introduction

Video Gamers' Relevance for Clinical Psychology

In the United States, video games have become a contentious topic in public discussion due to controversial events inferentially correlated with video game playing, including the Columbine, Sandy Hook, and Virginia Tech shootings (Brown v. EMA, 2011; Ferguson, 2007; 2013; Parents Television Council, 2011). Since these incidents took place, serious deliberation has occurred about the effects of playing violent video games on individuals and their relationship to negative and prosocial behaviors. Interest in the video game play has increased significantly, as shown by attempts to understand motivational roles, personality profiles, and effects of playing video games on the gamer (Anderson & Bushman, 2001; Anderson & Dill, 2000; Bean & Groth-Marnat, 2014; Yee, 2005; 2007). Even with the increase in research, much of the literature has focused on video games' connection to violence. Within this literature, a significant portion of research supported the idea of video games causing aggressive and violent tendencies within the individual. In contrast, other studies found no evidence to uphold this argument (Anderson & Bushman, 2001; Ferguson, 2007) suggesting, first, that there is no effect on the person playing violent video games, and second, that much of the current research linking increased aggression with video games is unfounded and flawed (Brown v. EMA, 2011; Ferguson, 2007; 2013; Olson, 2010). Alternative points of view suggest that increased aggressive reactions to video game play may be moderated by multi causal effects and tendencies found within the video gamers' social environment and individual game play (Ferguson, 2013 Przybylski, Deci, Rigby, & Ryan, 2014). However, with

much of the research focusing upon the violence and aggression debate, other avenues of exploring video gamers and their video games have been overlooked. Within these often ignored areas of video game play and video gamers, much has been introduced to the video game literature on personality traits, competitiveness, varying genres, preferred playing styles, and more.

Personality is a key feature of any person and is foundational to understanding an individual. It is well known that personality is a developmental trait formed throughout young adulthood that becomes solidified later in life (Carver & Scheier, 2004; McAdams, 2009; Phares & Chaplin, 1997). However, in youth and early adulthood, personality is not as stable or consistent as it is later in life. It is continually being shaped by the experiences of an individual related to family dynamics, friendships, and academic environments. This forming and reforming of key individual characteristics is fluid and continuously changing, with parts of the personality being reinforced while other parts are discarded due to necessity of the trait or lack thereof (Montemayor, Brown, & Adams, 1985; Phares & Chaplin, 1997). Because many young people are involved in video game experiences, it is important to discover a potential impact of video game playing on personality development.

In order to study the personality elements of gamers in general, online surveys will be utilized to obtain a wide range of participants. Participants in the study will be adults (individuals over the age of 18) who live in the United States, who consider themselves to be video gamers, who have an Internet connection, and who can take a 10-15 minute survey online. Conducting this research and collecting this data will allow a first-time compilation of gamer personality profiles to explore the population from a

personality-centered orientation establishing normative data. This exploration will allow a personality focused approach that views gamers' habits and will produce multiple personality profiles that can be compared to the BFI norms and a suggested antisocial personality profile of the BFI (low conscientiousness, low agreeableness, and high neuroticism) by Markey and Markey (2010). Therefore, this dissertation will attempt to build upon the current literature by exploring personality traits of video gamers who play specific genres of video games.

Researcher's Interest in the Topic

My interest in this topic is derived from my personal experiences of video gaming and the influential virtual worlds that gamers are able to play in. As a self-described gamer, I have partaken in many different explorations of virtual worlds and have immensely enjoyed the variation of experiences the different genres of gaming have had to offer. Each genre is a unique area to explore, tame, and master in its own right. My experience of being a gamer has changed as I have traversed through my own personal journey and has changed how the external world has viewed me. I have found through my personality and playing styles that I am more drawn to character development and Massive Multiplayer Online Role Playing Games (MMORPG) styles of playing. My expectation is that different personality profiles are drawn towards the different genres of gaming and that within these genres, when explored, variations of personality elements characterize players depending on their chosen playing styles or characters.

Hypotheses

It is expected that different typologies of gamers (i.e., casual, regular, hardcore video gamers) will produce different personality profiles. Dependent upon the video

gamers' preferred genres of play, it is predicted that the different genres played will attract different personality profiles. It is also hypothesized that a majority of gamers will not fit into a personality profile that is considered antisocial (e.g., high Neuroticism, and low Conscientiousness and Agreeableness), but individuals who enjoy competition may show more defined antisocial personality traits compared to those who do not enjoy competition as much (Markey & Markey 2010). Finally, a latent class analysis (LCA) will be performed to diagram out possible class associations among variables (i.e., preferred genres of play), thus creating a multifactorial map for video gamer's personality motivations for playing specific genres of video games and examining the pattern of relationships among the variables.

Chapter 2

Literature Review

Video Games

Video games have been a normalized function of entertainment since the arrival of the Nintendo Entertainment System in 1985 (Sheff, 1993). Since then, many new games, ideas, virtual worlds, and consoles have emerged in multiple forms that have catered to the gamer. Although general facts are known about the gamer population (e.g., the average age of the gamer in the United States is 30, and the typical gamer has been playing for an average of 13 years), there are multiple facts that are still unknown, including motivations, personality traits, and effects on individuals of game play (ESA, 2015; Ferguson, 2013). Entertainment Software Association (2013) reported that puzzle, board games, game shows, trivia games, and card games are the most often played online video games (34%) followed by action, sports, strategy, and role-playing (26%), casual and social (19%), persistent multiplayer universe (14%), and finally other uncategorized online games (7%). Additionally, 58% of Americans play video games, the average household in the United States owns at least one video game console and has two gamers, and the gender ratio of video game players is slightly larger in the favor of males (55%) over females (45%; ESA, 2015).

Research shows that video games have positive effects on individuals serving a wide range of emotional needs along with intellectual stimulation (Granic, Lobel, & Engels, 2014; Kato, 2010; Redd, Jacobsen, DieTrill, Dermatis, McEvoy, & Holland, 1987; Turkle, 1994; Vasterling, Jenkins, Tope, & Burish, 1993). Olson (2010) found that youth who played video games were able to express creativity more easily and had

increased social and intellectual curiosity and a larger focus to discover the real world compared to youth who did not play video games. Within the medical field, video games have been shown to help with the engagement of patients, pain management for chemotherapy treatments, and prevention of certain asthma attacks (Kato, 2010; Redd et al., 1987; Vasterling et al., 1993). Furthermore, video games are currently being used in some mental health settings and have resulted in clients being more cooperative and enthusiastic about psychotherapy (Kato, 2010). Finally, video games have been utilized in education to improve grades, learning, reading, and working with abstract ideas (Gee, 2007; Koster, 2005; Squire & Barab, 2004). However, non-replication of visuospatial information processing video game research conducted by Van Ravenzwaaij, Boekel, Forstmann, Ratcliff, and Wagenmakers (2014) concluded that although playing action video games does not improve the speed of information processing of a video gamer, with enough practice, playing any video game can improve information processing.

Aggressive behaviors associated with playing video games have also been noted in the video game research literature (Anderson & Bushman, 2001; Arriaga, Esteves, Carneiro, & Monteiro, 2006; Dill & Dill, 1998). Studies have specifically examined increased propensity for violent behavior, poor social skills, lower grades, poor achievement, and reduced interpersonal relationships of participants (Anderson & Bushman, 2001; Anderson & Dill, 2000; Arriaga et al., 2006; Dill & Dill, 1998). Scholars have emphasized that playing violent video games can increase violent tendencies and aggression. Additionally, it is thought that individuals who identify with their character within the virtual world may integrate aspects of the avatar's persona (i.e., assassin, soldier, hero, villain, etc.) in their actual lives (Anderson & Bushman, 2001;

Dill & Dill, 1998; Seung-A, 2011; Yoon & Vargas, 2014). Although a large amount of research has concluded that individuals who play violent video games are more likely to behave antisocially, only short term effects have been noted. In addition, replication studies have been unable to recreate similar results, suggesting that further research is required on possible long-term effects of aggression (Anderson & Bushman, 2001; Dill & Dill, 1998; Ferguson, 2007).

Przybylski, Ryan, and Rigby (2009) researched whether individuals played video games because of a motivating role of violence and violent content. They concluded that individuals did not play video games due to the violence found in the games, but rather because the games resulted in feelings of competency, mastery, and meaningful choices. These intrinsic satisfactions were found to deliver feelings of in-game presence and allow personal fulfillment from the sense of immersion within the virtual game (Ryan, Rigby, & Przybylski, 2006).

McGonigal (2011) has discussed gaming within the context that virtual worlds allow meaningful effort and purposeful activity that stimulates a part of an individual's self that is associated with completing work. McGonigal further stated that when gamers choose their own actions and busy work, they attain a sense of fulfillment. In essence, this outlook on the gamer world can be considered a restatement of the happiness hypothesis: work that individuals find to be meaningful provides intrinsic satisfaction (Haidt, 2006). Although this may be an important feature of gaming, it does not advance the understanding video games and their effect upon the video gamer.

Markey and Markey (2010) found that the combination of high neuroticism, low agreeableness, and low conscientiousness were found to validly and reliably predict

whether an individual would become hostile after playing violent video games. Utilizing this finding, Markey and Markey conducted further research utilizing archival data with 118 teenagers playing a violent or nonviolent video game. Using this new method, the participants' personality levels were assessed, and the study showed that individuals who were highly neurotic, less conscientious, and less agreeable were more likely to be hostile and aggressive after video game play compared to other personality formulations or even opposite personality traits in one of the three domains listed (neuroticism, conscientiousness, and agreeableness; main effect of high neuroticism, low agreeableness, and low conscientiousness: $r = .31$, 9.6% of the variance). Furthermore, as an individual's personality traits varied (i.e. increased or decreased among all five domains), the predisposition for aggressive behaviors after playing video games was reduced (e.g. low neuroticism, high agreeableness and conscientiousness; high neuroticism, agreeableness, and conscientiousness, etc.) Additionally, individuals who characteristically did not have these traits were not found to be as affected or unaffected by the violent video games. This finding leads researchers to believe that individuals who possess certain personality traits are more likely to be influenced by violent video games; however social, environmental, and situational factors may prove to be more indicative of aggression (personality markers equal 9.6% of the variance; Markey & Markey, 2010). This research further suggests that individual personality traits (i.e. agreeableness, conscientiousness, and neuroticism) appear to interact on a more significant level with virtual reality game play than once thought. However, one of these personality traits by itself does not constitute an antisocial marker, and Markey and Markey strongly suggest utilizing a cumulative effect of these three personality traits

(neuroticism, agreeableness, and conscientiousness) to determine antisocial or psychoticism-type personalities and a greater predisposition for aggressive behaviors.

Video games allow individuals to perceive different virtual realities (Goode, 2013). This finding suggests a move towards progressively more people becoming immersed in virtual worlds. Research has suggested that the effects range from detrimental (i.e., poor relationships and propensity for violence) to positive (higher intellect and faster reaction time). Therefore, researchers are continuing to explore video games and the individuals playing them (see Kato, 2010; Przybylski, Ryan, & Rigby, 2009; Redd et al., 1987). Despite this trend, little research has been conducted on the personality of individuals and their choice of character elements. However, sufficient research on the different typologies and elements of video game players to construct multiple perspectives of gamer profiles does exist.

Video Game Violence

The degree of whether violence within video games has a negative impact or influences behavior is a topic that has generated global discussion (Australian Government, Attorney General's Department, 2010, p. 32; Brown v. EMA, 2011). The debate is centered on the notion that what gamers are exposed to and are able to do within video games desensitizes them to the same experiences in real life situations (Anderson & Bushman, 2001; Anderson & Dill, 2000; Arriaga et al., 2006; Dill & Dill, 1998; Funk, Buchman, Jenks, & Bechtoldt, 2003; Huesmann, 2007). Due to the interactive nature of video games, the potential of engaging in activities in a virtual environment that would be deemed otherwise unacceptable in the real world suggests that video games promote and encourage anti-social behavior. Extensive research investigated the effects that exposure

to the themes found in violent video games (e.g., violence, sex, and drug use) is promoting the wrong message—that these kind of behaviors are considered acceptable (Parents Television Council, 2011). However, although there is considerable research investigating the negative effects associated with children playing violent video games, there is also substantial research asserting a lack of conclusive evidence to support the connection between aggression in video gamers and their engagement with violent video game content (Bean & Groth-Marnat, 2014; Brown v. EMA, 2011; Ferguson, 2007; 2013; Markey & Markey, 2010; Olson, 2010).

In the United States these arguments climaxed in a Supreme Court ruling stating that video games enjoy full speech protection from the Constitution (Brown v. EMA, 2011). Additionally, the Supreme Court raised concerns about the current state of video game research primarily citing evidence of methodological flaws found within the literature. Furthermore, researchers within the field have raised questions about the conclusiveness of the findings of the current research given claims of authorship bias, confounded methodologies, and possible moral panic agendas (Ferguson 2007, 2013). Because the research appears to be misinforming the public and is controversial at best, there is a transparent need for more research on video games in general and their effects on gamers to be provided to the public.

Personality

Personality is comprised of thought patterns, emotions, social perspectives, and behaviors exhibited consistently over time that influence and nurture one's expectations, self-concept, motivations, values, and attitudes (McAdams, 2009; Phares & Chaplin, 1997). Personality is inherent in every living person, a crucial element to understand the

individual, and a foundational pillar of psychology due to the various elements, adaptations, and traits found in individual persons (Carver & Scheier, 2004; Erikson, 1950, 1968). Within each person's personality, clusters and dimensions of personality traits show and describe how that person will interact with the world. These dimensions, traits, and clusters can be measured by various personality inventories (e.g. Minnesota Multiphasic Personality Inventory, Big Five Inventory, Personality Assessment Inventory, etc.) Personality behaviors, in general, are considered to be dimensions of the individual's internal mechanisms and features reflecting and reacting, directly and indirectly due to pressures from and experiences in society (Carver & Scheier, 2004; McAdams, 2009). Society may recognize these behavioral outcomes as negative or positive.

Personality develops in childhood, whereas identity begins to form in the adolescent stage of development (i.e., 10-18 years of age). Personality identity during the adolescent stage is considered to be malleable and flowing and can be easily changed (Montemayor, Brown, & Adams, 1985; Phares & Chaplin, 1997). During this time adolescents are attempting new ideas and concepts and are finding their own voice in the world. They are constantly being subjected to numerous unfamiliar thoughts and responsibilities in education, family, and social circles. From these experiences, adolescent personalities are emerging and forming new identities (Carver & Scheier, 2004; Erikson, 1950, 1968). Personalities are thought to be fully formed later in life, after the adolescent stage, when more life experience has been acquired. Due to the impressionability of the adolescent personality, scholars state that the capacity for proper decision making can be considered careless (DeLisi, Vaughn, Gentile, Anderson, &

Shook, 2012). The possibility of rash judgments and personal identity formation may be influenced from outside sources because of where adolescents are developmentally. Once personality elements have been interjected and "finalized," they become a solid part of the personality structure as the individual progresses through emerging adulthood.

Although personality is in part created by the environment, it is additionally believed to be dependent upon variants of genetic structure and heritability factors. Both in turn nurture adaptive and maladaptive personality traits and behaviors among individuals. If maladaptive behaviors are not curbed or intervened upon appropriately, these maladaptive personality traits become ingrained as a part of the individual and relied upon primarily. Such personality traits have also been linked to personality disorders and current taxonomies of personality, with current thought being not whether personality is influenced by genetics, but by how much (Bouchard, 2004).

Personality disorders are considered to be maladaptive behaviors, cognitions, and reactional thoughts stemming from the base personality of the individual. Researchers Distel et al. (2009) attempted to discover whether the five-factor model (FFM) of personality (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism) could be linked to Borderline Personality Disorder through phenotypic and genetic associations of monozygotic and dizygotic twins and siblings from Dutch, Belgian, and Australian families. Results suggested high heritability estimates of the FFM higher order variables ranging from 36-54% with higher phenotypic correlations for neuroticism and agreeableness. Conclusions drawn through the utilization of multiple regression analysis suggested the best predictors of borderline personality traits are high neuroticism and low agreeableness, proposing that personality traits have a genetic

loading susceptibly being nurtured via nature. As such, it is important to remember that personality is comprised of both nurture and nature (Bouchard, 2004).

Typology of Video Gamers

The development of player typologies has been a recent development over the past decade. Scholars have provided their own quasi-lexicon with the intention to identify personality traits of individual behaviors during play in an attempt to classify gamer typology from Multi User Dungeons (MUDs) and other virtual world video games (Bartle 2004, 2006; Fullerton, 2008; Radoff, 2011a, 2011b). A MUD is a real-time virtual world that is based entirely on text and was one of the first online virtual environments allowing people to interact with it (Bartle, 2004; 2006). Between 1989 and 1990 a lengthy debate broke out among users of MUDs on online forums to answer Bartle's question of "what do people want out of a MUD?"

Bartle (2004; 2006), a professor of computer science and co-inventor of Multi User Dungeons (MUDs), identified four player categories from an investigation of online forums based on in-game play styles: *Achievers, Socializers, Explorers,* or *Killers*. *Achievers* play within the virtual world to attain and accomplish hard goals, therefore giving an intrinsic sense of achievement through the progression. *Socializers* interact with other players in the virtual world and find the greatest satisfaction of playing the video game from these interactions. *Explorers* explore the virtual realms and find pleasure and excitement from discovering new areas and gaining knowledge of the newly discovered areas. Finally, *Killers* find it enjoyable to dominate other players within the virtual world by attacking, killing, or making other players' general experience of the game hard or annoying (Bartle, 2004; 2006).

Bartle's model has been criticized due to the exclusions of motivations of the gamer and their genre of focus (Fullerton, 2008; Radoff, 2011a, 2011b; Yee, 2007). Radoff (2011a) criticized Bartle's model by suggesting that it rejects various motivations and that "the concept of the explorer seems to overemphasize the idea of mapping out and literally exploring a landscape," suggesting an overarching and broad domain (p. 79). Furthermore, Radoff (2011a) rebukes the categorization of Bartle's player's typology due to overemphasizing the concepts, lack of concreteness in the typology, and over-broad categorization.

Fullerton's (2008), Radoff's (2011a, 2011b), and Yee's (2007) revised typologies recognized the diversity of gamers and their motivations when it comes to engaging and interacting with virtual worlds. In the case of such diversity not only with players, but also with games, it is possible to consider that more personal information (i.e., personality types and traits) may be required to form a more solid understanding of player motivations. This information would assist in distinguishing individual preferences to more completely identify what it is, exactly, that gamers are drawn to in virtual worlds.

The relationship between personality, aspects, and features in video games (e.g. game elements and mechanics) has gained interest among the academic community (Bean & Groth-Marnat, 2014; Ferro, Walz, & Greuter, 2013; Markey & Markey, 2010; Zammitto, 2010). It is becoming clearer that the relationship between both empirical and theoretical analyses of the personality of gamers, game elements, mechanics, game genres, and themes (i.e. violence) have connections to the personality of the gamers and the virtual worlds played (Bean & Groth-Marnat, 2014; Ferro, Walz, & Greuter, 2013; Markey & Markey, 2010; Zammitto, 2010). However, due to the inconclusiveness and

debate of current typologies, it is important to continue researching possible personality traits that may be pertinent to the typology of the player (e.g. personality) in order to further understand the video game player.

Video Game Genres

With the continual development of video games, various genres or categories have emerged throughout the years (Apperley, 2006; Crawford, 1997; McAllister, 2013). As video gamers' desires changed and technology improved, different genres of video games evolved as well. A video game genre is based upon the in-game play challenges, storyline, and game-world context (McAllister, 2013). Crawford (1997) suggested a then current taxonomy of video game genres divided into two main areas: *skill-and-action games* and *strategy games*. Within both main types were six individual *subtypes* or *subgenres*. A subgenre is a subcategory within a specific larger and overarching genre. For *skill-and-action games,* the six subtypes of subgenres were *combat games, maze games, sports games, paddle games, race games,* and *miscellaneous games*. Within the *strategy games* main genre were six subgenres of *adventures, D&D games, war games, games of chance, educational and children's games,* and *interpersonal games.* Since Crawford's (1997) taxonomy however, video games genres and subgenres have increased significantly.

Mark Wolf's book *The Medium of the Video Game* (2002) outlined a classification of video game genres based upon the developed categorization by the Library of Congress Moving Imagery Genre-Form Guide. Ultimately, Wolf systematically conceptualized video game genres into 42 categories: *Abstract, Adaptation, Adventure, Artificial Life, Board Games, Capturing, Card Games, Catching,*

Chase, Collecting, Combat, Demo, Diagnostic, Dodging, Driving, Educational, Escape, Fighting, Flying, Gambling, Interactive Movie, Management Simulation, Maze, Obstacle Course, Pencil-and-Paper Games, Pinball, Platform, Programming Games, Puzzle, Quiz, Racing, Role-Playing, Rhythm and Dance, Shoot 'Em Up, Simulation, Sports, Strategy, Table-Top Games, Target, Text Adventure, Training Simulation, and *Utility*. Although the list may appear comprehensive, it is not considered exhaustive, and many of the categories have strong similarities.

Apperley (2006, p. 6) is highly critical of the genres created for video games, stating that "*they cannot be regarded as a consistent medium."* Apperley stated that a larger issue for video game genres is their heavy emphasis upon "*diverse representation strategies at the expense of other common features*" (p. 7). Apperley suggested that the primary problem with generating specific genres for video games is based upon aesthetic groupings linked to previous forms of media (e.g. television, movies, board games, etc.) instead of an "ergodic interaction," how often a virtual player participates in a general action or interaction of events, within the virtual realm. As such, Apperley has conservatively represented video games into the following four main differentiating genres: *simulation, strategy, action,* and *role-playing.*

A more recent taxonomy proposed by McAllister (2013) includes the following eleven genres: *action, action-adventure, adventure, horrors, racing, shoot 'em ups, simulations, sport simulations, strategy, role-playing,* and *other*. However, similarities exist between some of the proposed genres, whereas others can be subsumed under other genres. An example of this would be the *horror* genre in that it could be included as an *action-adventure* subgenre, or a *shoot 'em up* could even be considered a subgenre of

action. However, there is still a lack of consensus of definitive video game genres (Apperley, 2006; McAllister, 2013). Although the debate for a consensus will continue as video games continue to evolve, McAllister's taxonomy will be utilized for defining the video game genres.

Video Game Genres Defined

Action video games challenge the video gamer in tests of physical skill, high reaction speeds, and good hand-eye coordination. Additionally, the *action* genre incorporates other elements that are not considered to be central to game play such as races, puzzles, challenges, and exploration demands. Individuals playing *action* video games are usually under time pressure to complete an objective while maintaining heightened attention and cognitive processes to meet the demands of the video game. *Shoot 'em ups* can be considered to be subsumed as a subgenre of *action* (McAllister, 2013).

Adventure video games began with computer text adventures and evolved into more elaborate interfaces and graphics as technology increased. This genre is generally not defined by a story or relied as heavily upon in game content, but describes a video game about solving puzzles by interacting with other in-game avatars or the environment in non-confrontational manners. Reflex challenges or action within the game are usually not a focus or part of the game play (McAllister, 2013).

Action-adventure genre games consist of elements found in *action* and *adventure* video games. Usually, the player is required to obtain a tool or in game item found within the virtual world that must be used to overcome larger obstacles or enemies in order to progress in the game. Within the virtual world of *action-adventure*, there are

consistent smaller obstacles that require navigation, combat, gathering, and simple puzzle solving in order to progress. These games tend to focus more heavily on exploration and item-gathering. *Horror* video games tend to be considered as a subgenre under *action-adventure* (McAllister, 2013).

Role-playing video games portray their game play as similar to role-playing board games like Dungeons & Dragons and World of Warcraft. The video game player specializes in a specific set of skills and role for group adventuring. The storyline of the game is usually linear, with progression mandatory for continual character development. Players must adventure through a large virtual over world inhabited by monsters of varying character levels. In order to progress through this type of game, you must acquire experience points and obtain stronger weapons and clothing, referred to as "gear." Character development is usually a main focal point of the video game, and fighting monsters in the virtual world is considered to be in "real-time," meaning instantaneous and continual instead of turn based (McAllister, 2013).

Simulation video games may be considered to be one of the most diverse categories of video games due to the simulation of real or fictional life. Video games in this genre attempt to replicate "real life" in the form of virtual reality for entertainment, job training, prediction, or analysis of situational outcomes. Usually there are few, if any, goal oriented actions within these virtual games besides experiencing different livable and life scenarios. As such, *racing* and *sports simulations* can be considered to be subgenres of this category for the pure simulation or experience of the virtual simulation (McAllister, 2013).

Strategy video games have a greater focus upon careful, methodical, and skillful planning. In most *strategy* genre video games, the individual creates, manages, and controls units within the virtual world in order to achieve victory against a computer or another human adversary. There are various strategy game plays such as real-time strategy (RTS), turn-based (TBS), and a mixture of the two. Real-time strategy video games do not progress in turns, but simultaneously as every player is continually creating, managing, and controlling units in an attempt to destroy the other avatars. Turn-based video games are exactly such; distinct periods of turn-based actions. Each player gets one turn in which to input a command, and then the control moves onto the next player in line, similar to a board game (McAllister, 2013).

The video game category of *other* is reserved for video games that do not fit into one of the other six categories such as music, party, programming, puzzle, electronic board games, trivia, and more. This area is set aside for video games who may not have a distinct genre yet or which may fit into multiple genres at once therefore defining a need for a new classification (McAllister, 2013).

The Big Five Inventory and Video Games

The Big Five Inventory (BFI) has been used in numerous studies to explore personality traits and other nuances found within gamer culture (i.e., motivation, behavior, linguistic metrics, and text analysis). Research has examined behavioral, written text, and linguistic correlates of personality, discovering connections of personality and motivations to behaviors in virtual worlds (Shen, Brdiczka, Ducheneaut, Yee, & Begole, 2012; Yee, 2005; 2007; Yee, Ducheneaut, Nelson, & Likarish, 2011; Yee, Harris, Jabon, & Bailenson, 2011). The relationship between personality and

motivation for playing online games was also investigated by Jeng and Teng (2008), who confirmed that personality traits influence player motivations. Additionally, Bean and Groth-Marnat (2014) explored personality traits and game play styles of World of Warcraft (WoW) players and discovered that different personalities preferred different styles of play. Furthermore, Graham and Gosling (2013) investigated the WoW player's personality and motivations for playing the Massive Multiplayer Online Role Playing Game (MMORPG) and observed that different motivations for playing were associated with different personality traits. In conclusion, the BFI has proven to be a reliable and consistent assessment tool, obtaining personality information and linking it to other areas of gaming with great success.

Gamers and gaming are a growing and expanding topic in the field of clinical psychology. A large focus of research has discussed the negative effects of gaming on the individual. Although early studies on the effects of gaming on gamers may have been a polarized approach to the effects of gaming, it has not been the only view to emerge. Recent studies have incorporated other areas of gaming such as motivational roles, medical usages, and positive aspects of gaming. However, there have been very few studies on understanding personality elements of gamers and their characters (Bean & Groth-Marnat, 2014; Yee, 2007). This study will be one of the first to collect necessary types of data to explore the personality of the gamer, preferred genres of play, character elements, and behavior in virtual worlds.

Chapter 3

Methods

Research Approach

This study utilized a quantitative approach (Creswell, 2003) that employed a systematic empirical investigation of social phenomena via statistical and mathematical procedures. Survey design, specifically, help to provide a numeric description of social trends or opinions of a population (Creswell, 2003; Gravetter & Wallnau, 2008). Through the use of statistical procedures and survey data, it was possible to compare large numbers of participants simultaneously using advanced statistical analysis (Field, 2009).

In the past decades, multivariate statistics used in research has become common, allowing large data sets to be analyzed in seconds instead of days through the use of software such as Statistical Package for the Social Sciences and MPlus (SPSS; Field, 2009; Geiser, 2013). Multivariate analysis supplies a method of analyzing multiple independent and dependent variables simultaneously (Grimm & Yarnold, 2003). This study utilized Bivariate Pearson Correlations, *t* tests, Multivariate Analysis of Variances (MANOVAs), and Latent Class Analysis (LCA) to explore, analyze, compare personality traits of gamers and their gaming habits, and create classes examining the role of personality traits in choosing a preferred genre of video game play (Field, 2009; Geiser, 2013; Grimm & Yarnold, 2003). This rationale for this procedure of analyzing the data was obvious: as the data itself will be numerical, there will be thousands of participants, and each survey will have multiple variables to analyze, providing an easy avenue in

which to properly evaluate the large data set efficiently (Gravetter & Wallnau, 2008; Geiser, 2013; Grimm & Yarnold, 2003).

Data Collection

In the data collection phase, participants were asked for demographic information pertaining to gaming habits, education (current and attained), age, gender, ethnicity, and time spent playing video games. In addition, participants completed the BFI via the online survey tool Surveygizmo. Furthermore, participants provided an email address if they wanted their results emailed to them.

Phase 1 consisted of gamers from seven defined genres of gaming (*action/shooter, action/adventure, adventure, role-playing, simulation, strategy,* and *other*). Gamers were asked additional gaming habit information. This information included video gamer's choice of primary console played, favorite games, self-categorization of gamer (hardcore, regular, casual, not a gamer), types of machines played on, and machine(s) owned. The gamers solicited were asked a variety of additional questions about their gaming history to ensure that more accurate data collection was established. For example, video gamers were asked to rank the genres in preference of play (1 through 7), but they were asked which genres they actually play in another question.

Participants

Participants were solicited through online forums, participant referrals of friends, and in game messaging, and needed to have access to a computer and Internet, be over 18 years of age, and be able to take an online survey for 5-10 minutes. Participants were able to forward the survey to fellow video gamers and post it in other places on the

Internet the administrator may not have known about or had access to. Anyone who played video games was allowed to participate. It was fairly easy to collect a large sample given that 51% of Americans play a form of video games and online forums and participant referral allowed easy access to all of them (ESA, 2015).

Procedures

The main strategy employed to reach potential participants was the use of gamer forums, social media, and participant referral. During three to six hour blocks, information was posted regarding the experiment and gamers were invited to answer the online questionnaire. During the posting phase, the forums were monitored for 5 days after each posting to ensure that questions would be answered on the forums.

Participants went online to a specific web site link that the researcher provided to participants through forums and in-game messaging. The participants then read an introduction to the study and an informed consent page on which they had to click a button stating that they had read the informed consent and acknowledge the study. Following the introduction and consent page, the participants were directed to the survey and demographics survey. If a participant opted into wanting to know their scores or the overall results, the researcher emailed the results via Blind Carbon Copy (BCC), with their individual BFI scores, briefly interpreted, to the participants at the conclusion of the study; otherwise the survey automatically scored the BFI for the participants and interpreted the score through online analysis. The participants were notified by email of the results and were informed that they could contact the researcher by email if they had any further questions.

Measures

To evaluate personality traits the Big Five Inventory (BFI), a self-report inventory was employed. The BFI is a five-point Likert scale comprised of 44 statements. Participants selected answers ranging from disagree strongly (1) to agree strongly (5). Tabulated answers broadly assessed the following five domains of personality: openness to experience (*inventive/curious vs. consistent/cautious*), conscientiousness (*efficient/organized vs. easy-going/careless*), extraversion (*outgoing/energetic vs. solitary/reserved*), agreeableness (*friendly/compassionate vs. cold/unkind*), and neuroticism (*sensitive/nervous vs. secure/confident*; Atkinson, Atkinson, Smith, Bem, & Nolen-Hoeksema, 2000; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008). The question format was designed to be administered in a 5-10 minute session. Psychometric properties reported by Rammstedt and John (2007) indicate that the BFI has shown good test-retest reliability (.84). Various tests of validity have indicated overall mean intercorrelation discriminant validity of .21, external validity of .56 relating to self-report and peer-reports of the BFI-44, convergent validity with the Revised NEO Personality Inventory (NEO-PI-R) of .78, and self-peer convergent validity of .56. The BFI has also been demonstrated to be valid and reliable across multiple cultures (Benet-Martinez & John, 1998; Grucza & Goldberg, 2007; Rammstedt & John, 2007).

In order to assess video gamers' preferred genres of play, McAllister's (2013) proposed genres were utilized, as they constituted a current classification. However, instead of 11 genres, there were seven in total. Four of the 11 were subsumed under other genres, given that they are characteristically similar. *Racing* and *sports simulators* were subsumed under *simulation*, *horrors* was considered a subgenre of *action*-

adventure, and *shoot 'em ups* was absorbed into the genre of *action*. Overall, the genres were *action, action-adventure, adventure, role-playing, simulation, strategy,* and *other*. Participants were required to rank the seven genres in order of preferred play. After, they were queried as to which ones they currently play for comparison of the preferred genre.

Statistical Analysis

Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity; all indicated normal variable distribution. Additionally, the data was screened and changed to numerical data where needed (e.g. participant self-categorization of gamer to 0 = not a gamer, 1 = casual gamer, 2 = regular gamer, 3 = hardcore gamer, and so on etc.; Field, 2009). Overall missing data was not changed, but categorized as "-99" so statistical procedures would not include the missing data in statistical analyses. Finally, the sample was analyzed as eight different samples: overall and by each preferred video game genre for the LPA.

Data was cleaned by deleting participants under the age of 18 and over the age of 60 as outliers and to ensure the sample was comparable to the BFI norms. Date of birth was statistically changed to "Age." Outliers (cases where data was egregiously under the minimum or over the maximum potentials) were deleted and not included within the sample. "Overall" video gamer data was not changed and computed as such. However, for each video game domain, seven in total, the data was cleaned further to only include video gamers who ranked the specific genre as "1" or their primary genre played. Data cleaning was then followed up by ensuring that the video gamer played the specific genre by further deleting cases which chose "0" or "I do not play this genre" for the "do you

play as [enter specific genre here]?" This ensured that those included in each sample were in fact playing the video game genre being evaluated.

The alpha level for all statistical analyses was set at .05 unless otherwise noted (Field, 2009; Grimm & Yarnold, 2003). Pearson correlations were employed to measure the relationship between gamers' playing behaviors and personality elements. These statistical inferences allowed a basic understanding of the relationships of personality elements, primary video game genres, virtual avatar elements, and gaming behaviors (Gravetter & Wallnau, 2008).

After correlations, *t* tests were employed to determine differences between variables with two levels of independent variable such as gender of the participants. *T* tests are appropriate for variables with two levels to discover significant interactional effects (Grimm & Yarnold, 2003). To control for error, if multiple *t* tests are performed the alpha will be adjusted according to how many *t* tests were conducted (e.g. .05 for 1, .025 for 2, etc.; Gravetter & Wallnau, 2008).

MANOVAs were utilized for assessing the differences between mean scores of the BFI domains as dependent variables and each of the independent variables. Because there were multiple independent variables and five dependent variables (the BFI domains), a MANOVA is appropriate for statistical analyses to discover significant interactional effects (Grimm & Yarnold, 2003). To control for error, Bonferroni corrections were used when appropriate. Data analysis and graphical representations was performed with SPSS with the level of significance at the 5% level unless otherwise noted.

Lastly, latent profile analysis (LPA) was conducted to determine classes for the entire participant base, whereas afterwards it additionally was conducted for each of the individual seven genres collected. Conducting LPA allowed an identification of unobservable subgroups of personality patterns within the population and the seven genres of game play. Latent profile analysis is a statistical procedure appropriate for classifying individuals into homogeneous subgroups while examining the pattern of relationships among the variables. It is based upon the statistically observed response patterns of participants from a set of questionnaire items, including Likert scale questions (Geiser, 2013). As such, it is appropriate for this dissertation research and the participants encountered. LPA was statistically utilized through a statistical program called Mplus Version 7, a statistical modeling program enabling researchers to analyze their data through a wider choice of models, estimators, and algorithms than what SPSS can provide (Muthen & Muthen, 2012).

Ethical Considerations

American Psychological Association guidelines on ethics were followed in this study so as to not harm participants. Each phase of the study provided informed consent, through which participants were required to acknowledge that they have read the informed consent. Additionally, the participants had knowledge of the general purpose of the study, what their information provided was used for, and referrals for services if they may felt they require either psychological treatment or other services.

The BFI survey is nonthreatening to the participant's physical or psychological health. It requests neutral and nonclinical information from the participant, and takes approximately 5-10 minutes to complete. It is possible that an individual under the age of

18 will want to participate in the survey. In order to deter these youths, a question was on the demographics page asking for the participants to write in their date of birth. If their age is below 18, then the researcher will not include their data in the analysis. It will be possible for the participant to deceive the researchers with their age, but the researcher monitored the age of the participants and the consent stated that the participant agrees that they are over the age of 18.

Participants were not identified at any point during the survey, as no identifying information was gathered except for the optional email for sending results. Since only cultural and playing time data was collected, this data cannot be used to identify any specific individual involved with this study. The data will be transformed into numerical data and applied into a spreadsheet on a cloud server. The information was already transformed, so if it is intercepted, it will be comprised of nothing but numbers, with the result being that it would not be possible to identify any of the participants (Nosek, Banaji, & Greenwald, 2002). This safeguarding of identity was done instantaneously as each individual completes the survey.

Although the Big Five Inventory is not considered to be within the public domain, it can be used for noncommercial research purposes. Director of the Berkeley Personality Lab, Dr. Oliver P. John, holds copyright on the BFI, and states on his website (http://www.ocf.berkeley.edu/~johnlab/bfi.htm) that individual researchers can freely use the instrument for noncommercial purposes.

The researcher will Blind Carbon Copy (BCC) the participant in an email so as not to allow anyone to see the participant's email if results have been requested. After the email(s) were sent, all traces of the correspondence were deleted. The cloud drive was

kept confidentially secured with a password, and only the researcher had access to the data and password. Feedback provided to the participants was neutral in nature, to assure that no clinical harm may occur. One illustrative example of the feedback provided to participants was as follows for the Extraversion scale (one of five scales):

> *Interpretation of these scores depends on your individual ranking on each scale. As shown above, there are five scales in total. If an individual scores in the middle of the scale (35-65%) then you may find that some of the qualities from scoring high and low on the specific scale apply and some may not. Scoring high or low on any of the scales is not indicative of failure or achievement, but of where you fall upon a spectrum of personality. The scales are Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. Their explanations are listed below.*
>
> ***Extraversion***
>
> *Individuals scoring in the middle of the scale tend to have traits of an extrovert and an introvert. The individual can have high positive emotions and enjoy the company of others, but at times may be more withdrawn, reserved, and have a preference for solitude. An individual scoring in this range enjoys interpersonal connections and high social engagement, but can also be comfortable by themselves and entertain their own ideas. While there may be a drive to meet up socially with other individuals, it is not always a requirement for satisfaction. In group settings, occasionally the individual may draw attention to themselves, but not necessarily enjoy the spotlight* (Adapted from McCrae & Costa, 1991).

If a participant incurred difficulty with the interpretation, suggested websites in which to find a mental health expert were provided automatically, as outlined in the procedure section.

Chapter 4

Results

Demographics

A total of 19416 participants participated in this study aged 18 to 60 years (see Table 1). They were primarily Caucasian (*N* = 15040, 77.5%), had an average of 14.20 years of education, are 25.05 years of age, plays video games 20.96 hours over 5.61 days a week and have been playing video games for 16.31 years on average. Participants primarily ranked the role-playing genre as highest preference of game play (*M* = 2.69), classified themselves as a regular gamer (*N* = 10348, 53.5%), played as a male avatar (*M* = 1.28), and primarily use a computer to play video games (*N* = 13742, 71%).

When the sample was divided by gender, it was primarily male (*N* = 16749; 86.26%), Caucasian across both genders, women had a higher mean of education (*M* = 14.76), but men played more video games per hour (*M* = 21.42), per week (*M* = 5.66), and had been playing slightly longer than females (*M* = 16.32 years). Both males and females preferred the role-playing genre overall (Males = 2.77, Females = 2.17), classified themselves as regular gamers (Males = 8781, 52.6%; Females = 1567, 59%), and primarily used computers to play video games (Males = 12127, 72.6%; Females 1615, 60.8%; see Table 2).

Cronbach's Alpha

Cronbach's Alpha was calculated using the entire sample's BFI answers across the five domain scores. All scores obtained through Cronbach's Analysis suggest good internal consistency ranging from .72-.87 (see Table 3).

Pearson Bivariate Correlations

A total of 289 Pearson Bivariate Correlations were conducted upon the data and 55 produced weak to strong results (see Table 4). The large sample size may have created unmeaningful statistical significance among the correlations thus requiring more stringent correlational interpretation. As such, Cohen's (1988) model of correlation interpretation effect sizes of correlations greater than .50 exhibiting a large correlation, .30-.49 demonstrating a moderate correlation, and .10-.29 establishing a small correlation may be considered to be too lenient. Ferguson (2009) suggests that in cases with large data sets, researchers should increase the correlation significance interpretation sizes to reduce false positive results. Therefore the new correlational sizes for interpretation are .80 or higher for large correlations, .50-.79 for medium correlations, and .20-.49 for small correlations. Given these new parameters, out of the original 55 correlations, only 18 remained significant with no large correlations found. One moderate negative correlation was found between age and years playing video games (r = .73, N = 19416, p = < .001).

Seventeen small correlations were found among the other variables. Participant's classification of gamer category (i.e. casual, regular, hardcore) was positively correlated days of the week playing video games (r = .37, N = 19416, p = < .001) and hours played per week (r = .30, N = 19416, p = < .001), whereas the number of hours per week playing video games was positively correlated with days played per week (r = .44, N = 19416, p = < .001), suggesting that as the classification of video gamers changed, so did their time and playing habits. The ranking of the adventure genre was negatively correlated with the action/shooter genre, but was positively correlated with the ranking of the action/adventure genre, suggesting that video gamers who play adventure genre video

games play less action/shooter themes video games, but more action/adventure video games most likely due to the overlap (r = -.29, N = 19416, p = < .001; r = .26, N = 19416, p = < .001). Higher rankings of the role-playing genre were negatively correlated with the action/shooter ranking indicating video gamers who preferred role-playing video games preferred action/shooter video games less (r = -.35, N = 19416, p = < .001). The ranking of the simulation genre was negatively correlated with the action/shooter ranking (r = -.23, N = 19416, p = < .001), action/adventure ranking (r = -.42, N = 19416, p = < .001), and the adventure ranking (r = -.25, N = 19416, p = < .001) indicating video gamers who ranking the simulation genre in higher preference consistently preferred action/adventure, adventure, and the action/shooter genres less. Similarly, the ranking of the strategy video game genre was negatively correlated with the action/shooter, action/adventure, and adventure genres implying a lesser preference for them (r = -.23, N = 19416, p = < .001; r = -.45, N = 19416, p = < .001; r = -.34, N = 19416, p = < .001). The video game genre of other was negatively correlated with the role-playing genre, suggesting that individuals who enjoy other video game genres listed additionally did not prefer the role-playing genres (r = - .23, N = 19416, p = < .001). Neuroticism was negatively correlated with extraversion (r = - .31, N = 19416, p = < .001), agreeableness (r = -.27, N = 19416, p = < .001), and conscientiousness (r = - .30, N = 19416, p = < .001). As neuroticism scores increased, extraversion, agreeableness, and conscientiousness scores decreased. Finally, openness to experience was positively correlated with extraversion (r = .27, N = 19416, p = < .001) suggesting as openness scores increased so did extraversion scores.

T tests

Ten independent-samples *t* tests were conducted for the overall sample to compare the personality scores for gender and preferred played gender choice (alpha adjusted to .005). Alpha was adjusted due to a requirement of reducing type three error from multiple *t* tests (.05/10 = .005). Regarding participant gender, females scored higher openness to experience, neuroticism, and agreeableness, whereas males scored higher in extraversion (see Table 5). The magnitude of the differences in the means was small for extraversion (Cohen's *d* = .11), agreeableness (Cohen's *d* = .06), and openness (Cohen's *d* = .15), but large for neuroticism (Cohen's *d* = .66).

With respect to participant's preferred played gender among the overall sample, participants who preferred to play as a female scored statistically higher in openness to experience and neuroticism, but participants who chose to play as a male scored higher in extraversion and agreeableness (see Table 6). The magnitude of the differences in the means was small for extraversion (Cohen's *d* = .19), conscientiousness (Cohen's *d* = .07), and openness to experience (Cohen's *d* = .08), but medium for neuroticism (Cohen's *d* = .33)

MANOVAs

Five MANOVAS were calculated (alpha adjusted to .01) utilizing extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience as the dependent variables and gamer self-categorization, video game systems most used, days of the week playing video games, participant ethnicity, and highest educational level attained as the independent variables (see Table 7). Alpha was adjusted due to a requirement of reducing type three error from multiple MANOVA tests (.05/5 = .01).

The MANOVA conducted upon video gamer self-categorization and the BFI traits returned statistically significant results for all three self-categorizations of gamers. However, Box's M was significant (p = < .001) as was the BFI categories for Levene's Test with the exception of neuroticism (p = .09). This suggests uneven groups among the self-categorization of video gamers and interpretability should be considered with caution even though Box's M is highly sensitive (Tabachnick & Fidell, 2013). In order to compensate for this, Pillai's Trace was used to assess significance on the MANOVA (see Table 8). When the results for the BFI domains were examined, all five scales reached statistical significance (see Table 9). An inspection of the mean scores indicated video gamers who classified themselves as casual gamers had statistically higher extraversion and conscientiousness scores as compared to the gamers who classified themselves as regular or hardcore gamers. In addition, the casual gamer had statistically higher agreeableness and neuroticism scores when compared to the hardcore gamer. The regular gamer had statistically higher agreeableness scores and statistically lower openness to experience scores compared to the hardcore gamer. Inspecting the univariate tables produced identical results as the MANOVA.

The MANOVA performed upon systems used most to play video games and the BFI domains returned statistically significant results for all five systems used to play video games. Box's M did not reach statistical significance of less than .001 (p = .005; Tabachnick & Fidell, 2013), but one BFI domain, neuroticism, was found to be significant for the Levene's test. In order to compensate for this, Pillai's Trace was used to assess significance across the five BFI traits (see Table 8). When the results for the BFI domains were examined, all five scales reached statistical significance (see Table

10). Evaluation of the mean scores indicated that video gamers who preferred primarily playing on computers and handheld devices had statistically lower extraversion scores when compared to smart phone, tablet, and console preferred video gamers. Video gamers who preferred playing on computers were additionally found to have statistically lower agreeableness scores compared to video gamers preferring to play on consoles. Regarding the BFI trait of conscientiousness, video gamers preferring to play on computers and handheld devices scored statistically lower than those who preferred console and tablet games. Video gamers who preferred to play on handheld devices statistically scored higher on the neuroticism trait when compared to video gamers who preferred computers, consoles, and smart phones to play video games on. Finally, on the BFI personality trait of openness to experience, video gamers preferring a computer scored statistically lower than those who preferred playing on a console. Inspecting the univariate tables produced identical results as the MANOVA.

The MANOVA conducted upon video gamer's number of days playing video games and the BFI traits returned statistically significant results for all seven self-categorizations of gamers. However, Box's M was significant ($p = < .001$), as were the BFI categories for Levene's Test, with the exception of neuroticism ($p = .45$). This suggests uneven groups among the number of days played and interpretability should be considered with caution even though Box's M is highly sensitive (Tabachnick & Fidell, 2013). In order to compensate for this, Pillai's Trace was used to assess significance on the MANOVA (see Table 8). Examination of the mean scores indicated that video gamers who played 7 days a week had statistically lower extraversion scores than all of the video gamers who played 1-6 days a week, whereas those who played video games 6

days a week were statistically lower in extraversion than those who played 3 or 4 days a week. Video gamers who played 7 days a week additionally had statistically lower agreeableness scores compared to those who play 2-6 days a week. Evaluation of the conscientiousness personality trait showed video gamers who played video games 7 days a week, again, had lower conscientiousness score compared to video gamers who played 1-6 days a week. Additionally, video gamers who played 6 days a week also had statistically lower conscientiousness scores compared to video gamers who played 2-5 days a week. As for the neuroticism personality trait, video gamers who played 7 days a week scored statistically higher in neuroticism levels than those who only played for 4 or 6 days a week; the other days did not return statistically significant results in this area. Finally, video gamers who played video games 7 days a week scored significantly lower in openness to experience compared to video gamers who played 2-6 days per week. Additionally, those who only played 4 days a week had statistically higher scores in openness than those who played 6 days a week (see Table 11). The results were supported in that inspecting the univariate tables produced identical results as the MANOVA.

The MANOVA conducted upon video gamer's ethnicity and the BFI traits returned statistically significant results for all six ethnicities of video gamers. However, Box's M was significant (p = < .001), suggesting unequal groups, as were the BFI categories extraversion and neuroticism for Levene's Test. However, agreeableness (p = .24), conscientiousness (p = .63), and openness to experience (p = .24) were not found to be significant for Levene's Test. This suggests that uneven groups between the statistically significant ethnicities and interpretability should be considered with caution,

even though Box's M is highly sensitive (Tabachnick & Fidell, 2013). In order to compensate for this, Pillai's Trace was used to assess significance on the MANOVA (see Table 8). Evaluation of the means scores indicated multiracial video gamers had statistically higher extraversion scores when compared to Asian/Pacific Islanders, Black/African American, and Caucasian video gamer players. However, Caucasian video gamers scored statistically higher on extraversion when compared to Asian/Pacific Islander video gamers. For agreeableness, Caucasian and Hispanic video gamers scored statistically higher when compared with Asian/Pacific Islanders. Asian/Pacifica Islanders scored statistically lower on conscientiousness when compared to Caucasian, Hispanic, and Multiracial video gamers. However, Asian/Pacific Islanders scored statistically higher on neuroticism when compared to Black/African American, Caucasian, and Hispanic video gamers. Lastly, Asian/Pacific Islander score statistically lower on openness to experience when compared to Black/African American, Caucasian, Hispanic, and Multiracial video gamers (see Table 12). Inspection of the univariate tables produced identical results as the MANOVA.

The final MANOVA was conducted upon participants' highest educational level attained and the five domains of the BFI reaching statistical significance for all eight educational levels of video gamers. Box's M was significant ($p = < .001$), as were the BFI categories conscientiousness, neuroticism, and openness to experience with Levene's Test of equality. However, extraversion ($p = .20$) and agreeableness ($p = .21$) were not found to be significant for Levene's Test. This suggests uneven groups between the statistically significant attained educational levels and interpretability should be considered with caution even though Box's M is highly sensitive (Tabachnick & Fidell,

2013). In order to compensate for this, Pillai's Trace was used to assess significance on the MANOVA (see Table 8). Evaluation of the means scores indicated video gamers who attained doctorate levels of education had statistically higher extraversion scores when compared to video gamers who educationally did not complete any education, completed high school, their GED, technical college, associate's, and bachelor's. Video gamers who attained their master's degree had statistically higher extraversion scores compared to video gamers who did not complete any education, completed high school, and GED, whereas video gamers who completed their bachelor's had statistically higher extraversion scores compared to those who did not complete any education and completed high school. For agreeableness, no completion of education scored statistically lower compared to video gamers who completed high school, their GED, technical college, associate's, bachelor's, and master's. In addition, video gamers who only completed high school scored statistically lower compare to video gamers who completed associate's or bachelor's. Regarding conscientiousness, video gamers who did not complete any education scored significantly lower compared to video gamers who completed high school, a GED, technical college, associate's, bachelor's, master's, and doctorate. However, video gamers who completed high school or their GED scored statistically lower compared to video gamers who completed technical college, associate's, bachelor's, master's, and doctorate. Additionally, video gamers who completed technical college scored lower compared to video gamers who completed bachelor's, master's, or doctorates. Finally, video gamers who completed their associate's or bachelor's scored significantly lower compared to video gamers who completed their doctorate. Contrasting the BFI domain of neuroticism, video gamers

who did not complete any education, high school, or their GED scored significantly higher compared to video gamers who completed their associate's, bachelor's, master's, and doctorates. In addition, video gamers who completed technical college scored higher compared to video gamers who completed their doctorates. Finally, regarding openness to experience, video gamers who attained associate's, bachelor's, or doctorates scored statistically higher compared to video gamers who did not complete any education or who completed high school or technical college. However, video gamers who completed their associate's or bachelor's scored lower compared to video gamers who completed their master's. In addition, video gamers who completed their master's scored statistically higher compared to video gamers who did not complete any education, completed high school, their GED, and technical college (see Table 13). Inspecting the univariate tables produced identical results as the MANOVA.

Latent Profile Analysis

Eight LPA analyses were conducted upon the data, one for the overall sample, and seven across the participants preferred playing genre. Choice of the best model for all eight LPA analyses was determined by six model fits criterions: Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Sample Size Adjusted Bayesian Information Criterion (sBIC), the Lo-Mendell-Rubin Adjusted Likelihood Ration Test (LMRT), the Bootstrapped Lo-Mendell-Rubin Likelihood Ratio Test (BLRT), and the classification of fit statistic Entropy. Nylund, Banaji, & Greenwald (2007) suggested the criterion BIC as identifying the best fit model with lower scores being representable of identifying appropriate numbers of classes from the data. Additionally, Nylund et al. explained that using the LMRT variable in conjunction with the BIC as the BLRT might

be affected by nonsymmetrical data distributions and thus could provide inaccurate interpretation (Nylund et al., 2007). An additional probability characteristic of importance is the principle of parsimony. According to Collins and Lanza (2013), who explain this model, when two or more models have the ability to represent the data similarly well, the model that is simplest while remaining statistically rigorous should be selected as the best fit model.

When evaluating the LPA for the overall sample, solutions with multiple profiles who considered to fit the data better than a unitary solution (see Table 14). The LMRT indicated that the fit did not reach statistical significance when increasing the number of latent profiles from six to seven (p = .08) and from seven to eight (p = .13). Although the BIC did not completely plateau at eight latent profiles, its decrease significantly declined compared to earlier profile results (see Figure 1). Coupled with the non-significant LMRT at seven and eight classes, it appeared that attempting further profile pulling would not produce significant results. Examination of the possible profiles (two through six) it was determined class pulls of four would be the best fit for the overall sample as three, five, and six profiles were too similar (see Figures 2, 3, 4), and two profiles was determined to be too simple (see Figure 5). Four profiles appeared to be the best solution due to the differences observed between the profile personality traits (see Figure 6).

Evaluating the mean scores of the four profiles revealed differences among the mean scores suggested varying personality profiles. Profile 1 was named Introversive because of the lower mean values in four of the BFI traits, but higher in emotionality compared to the other three profiles. This is additionally consistent with past research on introverts showing higher negative emotionality (i.e. neuroticism) and lower means in

other personality traits compared to extroverted individuals (McCrae & Costa, 1991). Profile 3 was named Extroversive because of the higher mean values in four of the BFI traits, but low emotional labiality compared to the other three profiles. This class was further defined as Extroversive upon the theoretical basis of being extroverted and the social interaction tendencies of extroverted individuals (e.g. being open to new experiences, low negative emotionality, more conscious of others around them, and more socially agreeable; McCrae & Costa, 1991). Profiles 2 and 4 had mean scores that fell between the Introversive and Extroversive profiles, with the exception of Profile 2 in neuroticism, suggesting two middle classes of personality denoted as Ambiversive classes. These two classes primarily differed on their neuroticism scores. As such, they were labeled as Secure Ambiversive for lower neuroticism (Profile 2) and Insecure Ambiversive for higher neuroticism (Profile 4; see Table 15).

For the solution with four latent profiles, the average probabilities for the most likely class membership were .930 for the Introversive profile, .901 for Secure Ambiversive profile, .929 for the Extroversive profile, and .911 for Ambiversive profile (see Table 16) with an entropy values of .854 (see Table 14) suggesting a good fit. The profiles were characterized by statistical differences in all BFI dimension mean values (p = < .001). The Introversive profile was comprised of 4,493 participants (23.5% of the sample), the Secure Ambiversive profile encompassed 5,046 participants (26.3% of the sample), the Extroversive profile contained 4,004 participants (20.9% of the sample), and the Insecure Ambiversive profile held 5,621 participants (29.3% of the sample).

LPA for the preferred played action/adventure sample.

Regarding the LPA for the participant preferred playing genre of action/adventure, solutions with multiple profiles again fit the data better than a unitary solution (see Table 17). The LMRT specified the fit did not reach statistical significance when increasing the number of latent profiles to four from three (p = .34) while the decrease in BIC was not finalized at four profiles, its decrease significantly declined compared to earlier profile results (see Figure 7), and was observed as having the largest decrease at two profiles from one unitary profile. Evaluating the model fit criterion for the action/adventure genre two different solutions were possibilities, Solutions 2 and 3. Solution 3 was chosen as a result of appropriate matching to the overall Sample 4 profile solution and Solution 2 being determined as less differentiated across the profiles.

Evaluating the mean scores across the three latent profiles showed similarities between the profiles found in the overall sample and were labeled as such. They were the Introversive profile (Profile 1), the Insecure Ambiversive profile (Profile 2), and the Secure Ambiversive profile (Profile 3; see Figure 8). The Introversive profile was comprised of 987 participants (37.4% of the sample), Insecure Ambiversive profile encompassed 795 participants (30.1% of the sample), and the Secure Ambiversive profile contained 859 participants (32.5% of the sample; see Table 18). For the solution with three latent profiles, the average probabilities for the most likely class membership were .945 for the Introversive profile, .903 for the Insecure Ambiversive profile, and .940 for the Secure Ambiversive profile (see Table 18), with an entropy value of .847 (see Table 17) suggesting a good fit. The profiles were characterized by significant differences in all BFI dimension mean values (p = < .001). The Introversive profile was lower in

extraversion, and openness to experience, but middle in agreeableness, conscientiousness, and neuroticism when compared to the other two profiles. The Insecure Ambiversive profile was in the middle in extraversion and openness to experience, but was highest in neuroticism and lowest in agreeableness and conscientiousness when compared to the other three profiles. Finally, the Secure Ambiversive profile was highest in extraversion, agreeableness, conscientiousness, and openness, but had the lowest scores in neuroticism when compared to the other two profiles (see Table 19). Evaluating the groups found, the Introversive personality profile was most frequently found by those who preferred the genre of action/adventure followed by the Insecure Ambiversive and then by the Secure Ambiversive.

LPA for the preferred played action sample.

Examination of the LPA for participant preferred playing genre of action, solutions with multiple classes fit the data better than a unitary solution (see Table 20). The LMRT indicated that the fit did not reach statistical significance when increasing the number of latent classes to five from four (p = .34), whereas the decrease in BIC plateaued at six latent classes (see Figure 9), and was observed as having the largest decrease at two latent profiles from one unitary profile. Evaluating the model fit criterion for the action genre three different solutions were possibilities, Solutions 2, 3, and 4. Solution 4 was chosen as a result of appropriate matching to the overall sample four profile solutions, Solutions 2 and 3 being determined as less differentiated across the profiles.

Evaluating the mean scores across the four latent profiles showed similarities between the profiles found in the overall sample and were labeled as such. They were the

Introversive profile (Profile 1), the Insecure Ambiversive (Profile 2), the Extroversive profile (Profile 3), and the Secure Ambiversive profile (Profile 4; see Figure 10). The Introversive profile was comprised of 596 participants (16.6% of the sample), the Insecure Ambiversive profile encompassed 1,026 participants (28.6% of the sample), the Extroversive profile contained 912 participants (25.5% of the sample), and the Secure Ambiversive profile included 1,048 participants (29.3% of the sample; see Table 20). For the solution with four latent profiles, the average probabilities for the most likely class membership were .928 for the Introversive profile, .914 for the Insecure Ambiversive profile, .933 for the Extroversive profile, and .912 for the Secure Ambiversive profile (see Table 21) with an entropy value of .861 (see Table 20) suggesting a good fit. The profiles were characterized by statistical differences in all BFI dimension mean values (p = < .001). The Introversive profile was lowest in all BFI domains except for neuroticism in which it had the highest mean when compared to the other three profiles. The Insecure Ambiversive profile was in the middle for extraversion, but lower than the Extroversive profile and higher than the Secure Ambiversive and Introversive profiles. Additionally, the Insecure Ambiversive profile was lower in agreeableness, conscientiousness, and openness to experience when compared to the Secure Ambiversive and Extroversive profiles, but higher in these areas when compared to the Introversive profile. Finally the Insecure Ambiversive profile was lower in neuroticism when compared to the Introversive profile, but higher than the Extroversive and Secure Ambiversive profiles. The Extroversive profile had the highest means for all domains, except in neuroticism where it was the lowest, when compared to the other three profiles. Finally the Secure Ambiversive profile had higher mean scores

when compared to the Introversive profile except in neuroticism where it was lower, had lower mean scores in all domains of the BFI when compared to the Extroversive profile, except for neuroticism where it was higher, and had lower mean scores for extroversion, and neuroticism, but higher mean scores in agreeableness, conscientiousness, and openness to experience when compared to the Insecure Ambiversive profile (see Table 22). Examining the groups found, the Secure Ambiversive profile was most frequently found by video gamers who preferred playing the action video game genre. The Secure Ambiversive profile was closely followed by the Insecure Ambiversive profile then the Extroversive and finally by the Introversive profile. According to these results Ambiversive video gamers were the highest found personality profiles found (57.9% of the sample).

LPA for the preferred played adventure sample.

According to the LPA for the participant preferred playing genre of adventure, solutions with multiple profiles fitting the data better than a unitary solution (see Table 23). The LMRT indicated that the fit did not reach statistical significance when increasing the number of latent profiles to three from two (p = .51) while the decrease in BIC plateaued at six latent profiles (see Figure 11) and was observed as having the largest decrease at two latent profiles from one unitary profiles. Evaluating the model fit criterion for the adventure genre, one solution was of possibility. In the sense of parsimony and LMRT significance, the two latent profile solution was chosen as indicative of best fit for the adventure genre sample.

Evaluating the mean scores across the two latent profiles showed similarities between the profiles found in the overall sample and were labeled as such. They were the

Insecure Ambiversive profile (Profile 1) and the Secure Ambiversive profile (Profile 2; see Figure 12). The Insecure Ambiversive profile was comprised of 487 participants (53.1% of the sample) while Secure Ambiversive profile contained 430 participants (46.9% of the sample; see Table 23). For the solution with two latent classes, the average probabilities for the most likely class membership were .957 for the Insecure Ambiversive profile and .959 for the Secure Ambiversive profile (see Table 24), with an entropy value of .851 (see Table 23) suggesting a good fit. The profiles were characterized by statistical differences in all BFI dimension mean values (p = < .001). The Insecure Ambiversive profile had lower extraversion, agreeableness, conscientiousness, and openness to experience, but higher neuroticism when compared to the Secure Ambiversive profile (see Table 25). Evaluating the groups found, even with them being split between Insecure and Secure Ambiversive, the profiles were all Ambiversive profiles suggesting an Ambiversive personality primarily plays the adventure video game genre.

LPA for the preferred played role-playing sample.

Evaluation of the LPA for the Role-Playing sample suggested solutions with multiple profiles who considered to fit the data better than a unitary solution (see Table 26). The LMRT indicated that the model fit did not reach statistical significance when increasing the number of latent profiles from four to five (p = .05) and from five to six (p = .09). The BIC plateaued at six profiles, suggesting that more latent profiles would be nonsignificant (see Figure 13). Evaluating the model fit criterion for the action genre, three different solutions were possibilities, Solutions 2, 3, and 4. Solution 4 was chosen

as a result of appropriate matching to the overall sample four profile solutions, Solutions 2 and 3 being determined as less differentiated across the profiles.

Evaluating the mean scores across the four latent profiles showed similarities between the profiles found in the overall sample and were labeled as such. They were the Secure Ambiversive profile (Profile 1), the Extroversive profile (Profile 2), the Introversive profile (Profile 3), and the Insecure Ambiversive profile (Profile 4; see Figure 14). The Secure Ambiversive profile was comprised of 1,927 participants (26.4% of the sample), the Extroversive profile encompassed 1,410 participants (19.3% of the sample), the Introversive profile contained 1,895 participants (26.1% of the sample), and the Insecure Ambiversive profile included 2,050 participants (28.2% of the sample). For the solution with four latent profiles, the average probabilities for the most likely class membership were .906 for the Secure Ambiversive profile, .926 for the Extroversive profile, .933 for the Introversive profile, and .920 for the Insecure Ambiversive profile (see Table 27) with an entropy value of .861 (see Table 26) suggesting a good fit. The profiles were characterized by statistical differences in all BFI dimension mean values ($p = < .001$).

The Secure Ambiversive profile was in the middle above the Introversive profile for extraversion, neuroticism, and openness to experience, but below the Insecure Ambiversive and Extroversive profiles. Additionally, the Secure Ambiversive profile was in the middle for the BFI domain of agreeableness and conscientiousness just below the Extroversive profile, but above the Insecure Ambiversive and Introversive profiles. The Extroversive profile had the highest means for all domains, except in neuroticism where it was the lowest, when compared to the other three profiles. The Introversive

profile was lowest in all BFI domains except for neuroticism in which it had the highest mean when compared to the other three profiles.

Finally the Insecure Ambiversive profile had higher mean scores when compared to the Introversive profile except in neuroticism where it was lower, had lower mean scores in all domains of the BFI when compared to the Extroversive profile, except for neuroticism where it was higher, and had lower mean scores for extroversion, and neuroticism, but higher mean scores in agreeableness, conscientiousness, and openness to experience when compared to the Insecure Ambiversive profile (see Table 28). Examining the profiles found, Insecure Ambiversive video gamer profiles were most frequently found. This was followed by the Secure Ambiversive personality profile, then the Introversive Profile, and finally by the Extroversive profile. According to these results Ambiversive video gamers were the highest found personality profiles found (54.6% of the sample).

LPA for the preferred played simulation sample.

According to the LPA for the participant preferred playing genre of simulation, solutions with multiple profiles fitting the data better than a unitary solution (see Table 29). The LMRT indicated that the fit did not reach statistical significance when increasing the number of latent profiles to three from two (p = .40), while the decrease in BIC plateaued at five latent profiles (see Figure 15) and was observed as having the largest decrease at two latent profiles from one unitary profiles. Evaluating the model fit criterion for the simulation genre, one solution was of possibility. In the sense of parsimony and LMRT significance, the two latent profile solution was chosen as indicative of best fit for the simulation genre sample.

Evaluating the mean scores across the two latent profiles showed similarities between the profiles found in the overall sample and were labeled as such. They were the Introversive profile (profile 1) and the Extroversive profile (Profile 2; see Figure 16). The Introversive profile was comprised of 537 participants (48.2% of the sample) while the Extroversive profile contained 577 participants (51.8% of the sample; see Table 28). For the solution with two latent profiles, the average probabilities for the most likely class membership were .951 for the Introversive profile and .953 for the Extroversive profile (see Table 30), with an entropy value of .844 (see Table 29) suggesting a good fit. The profiles were characterized by statistical differences in all BFI dimension mean values (p = < .001). The Introversive profile had lower mean scores in all BFI domains except for neuroticism in which it had a higher mean score compared to the Extroversive profile (see Table 31). Examining the profiles found, the Extroversive personality profile was most frequently found by those who preferred the genre of simulation video games followed by the Introversive profile.

LPA for the preferred played strategy sample.

Examining the LPA for the participant preferred playing genre of strategy, solutions with multiple profiles fitting the data better than a unitary solution (see Table 32). The LMRT indicated that the fit did not reach statistical significance when increasing the number of latent profiles to three from two (p = .07), while the decrease in BIC began plateauing at four latent profiles (see Figure 17) and was observed as having the largest decrease at two latent profiles from one unitary profiles. Evaluating the model fit criterion for the strategy genre, one solution was a possibility. In the sense of

parsimony and LMRT significance, the two latent profile solution was chosen as indicative of best fit for the strategy genre sample.

Evaluating the mean scores across the three latent profiles showed similarities between the profiles found in the overall sample and were labeled as such. They were the Introversive profile (Profile 1) and the Extroversive profile (Profile 2; see Figure 18). The Introversive profile was comprised of 1,062 participants (45.8% of the sample) while the Extroversive Profile contained 1,258 participants (54.2% of the sample). For the solution with two latent profiles, the average probabilities for the most likely class membership were .958 for the Introversive profile and .958 for the Extroversive profile (see Table 33) with an Entropy value of .855 (see Table 32) suggesting a good fit. The profiles were characterized by statistical differences in all BFI dimension mean values (p = < .001). The Introversive profile had lower mean scores in all BFI domains except for neuroticism in which it had a higher mean score compared to the Extroversive profile (see Table 34). Evaluating the personality profile groups found, Extroversive personalities were the majority of video gamers who preferred the strategy video game genre followed by the Introversive profile.

LPA for the preferred played other sample.

According to the LPA for the participant preferred playing genre of other, solutions with multiple profiles fitting the data better than a unitary solution (see Table 35). The LMRT indicated that the fit did not reach statistical significance when increasing the number of latent profiles to three from two (p = .63), whereas the decrease in BIC plateaued at four latent profiles (see Figure 19) and was observed as having the largest decrease at two latent profiles from one unitary profiles. Evaluating the model fit

criterion for the simulation genre, one solution was a possibility. In the sense of parsimony and LMRT significance, the two latent profile solution was chosen as indicative of best fit for the simulation genre sample.

Evaluating the mean scores across the two latent profiles showed similarities between the profiles found in the overall sample and were labeled as such. They were the Introversive profile (Profile 1) and the Extroversive profile (Profile 2; see Figure 20). The Introversive profile was comprised of 476 participants (49% of the sample) while the Extroversive profile contained 496 participants (51% of the sample). For the solution with two latent profiles, the average probabilities for the most likely class membership were .964 for the Introversive profile and .957 for the Extroversive profile (see Table 36), with an entropy value of .870 (see table 335) suggesting a good fit. The profiles were characterized by statistical differences in all BFI dimension mean values ($p = < .001$). The Introversive profile had lower mean scores in all BFI domains except for neuroticism in which it had a higher mean score compared to the Extroversive profile (see Table 37). Examining the groups found, the Extroversive and Introversive profiles were almost equally found in the other video game genre of other.

Results Summary

Scrutinizing the overall results of the *t* tests, MANOVAs, and LPA, it is clear that sample size influenced many of the statistics. For example, most of the *t* test and MANOVA statistics reached significance, but examining the mean differences showed they were primarily less than two points suggesting very little difference among the mean scores. The sheer number of participants advocated a statistical difference, but examining the overall score differences provided greater insight to how small the

differences were. Within the *t* tests the BFI trait of neuroticism had the largest difference in mean size specifically across gender (e.g. 4.28), followed by video gamer preferred played gender (e.g. 2.24), whereas the other differences each ranged less than two points. The MANOVAs additionally resulted in frequent small mean differences (i.e. less than 2 points) across all five MANOVAs conducted, suggesting that the population size heavily influenced the statistical analysis with the large sample size, resulting in small effect sizes being significant when they were not.

Four personality profiles were found across the entire sample during LPA: Introversive, Extroversive, Insecure Ambiversive, and Secure Ambiversive. These profiles in turn were additionally extrapolated differently across the seven genres of video games researched. The Introversive profile was strongly found in the action/adventure, role-playing, simulation, strategy, and other video game genres, but weakly found in the action genre. The Extroversive profile was similarly found primarily in the action, simulation, strategy, and other video game genres, but weakly found in the role-playing genre. Most importantly, Insecure and Secure Ambiversive profiles were only found in the action/adventure, action, adventure, and role-playing genres. As such, personalities appear to gravitate to specific genres possibly based upon their personality traits.

Chapter 5

Discussion

This study investigated the personality traits in regards to the domains of the Big Five Inventory (BFI) of the video gamer population across seven accepted genres. In total, 19416 video gamers completed the survey, an extremely robust sample. The total number of participants influenced the statistical results in the correlations, *t* tests, and MANOVAs providing significant results but low effect sizes with regard to differences, with the exception of the LPA. The number of participants suggested a significant statistical difference among the various groupings, but evaluating the mean differences resulted in greater insight into how small the differences were. As such, stricter statistical criteria were utilized to determine the relative importance for the correlations, *t* tests, and MANOVAs ignoring findings that were statistically significant but still did not have large effect sizes.

Correlations

Correlational findings provided support for the video gamers' preference for specific genres over others, but not causation. Video gamers who preferred the adventure genre additionally reported preferring the action/adventure video game genre (7% of the variance), but not the action genre (8% of the variance). This may be due to the preference for adventure over action in gameplay. The act of adventuring through the virtual realm and discovering new areas, items, puzzles, and gameplay appears to be of more preferential interest over actual action found within the video game for the video gamers who ranked the adventure genre higher (McAllister, 2013). This is consistent with Yee's (2007) motivation subcomponent of *discovery* of the *immersion* component of

motivational play of the video gamer placing preference on discovery and knowledge of the video game that other players may not know about. It is also similar to Bartle's (2004) typology of the *explorer/scientist*, where video gamers interact with the virtual worlds in order to discover and gain new knowledge of the video game realm as well as Fullerton's (2008) typology of the *explorer* or the video gamer who is curious about the world around them, enjoys seeking new areas, and tests the boundaries and limits of the video game.

Video gamers who preferred the role-playing genre as a primary form of video game play appeared to rate the action/shooter genre significantly lower (12% of the variance). This may be due to the preference of a storyline and progression mixed with adventuring and character development. Within the role-playing genre one must continually enhance their gear and weapons in order to progress, but in the action/shooter genre, one usually utilizes the same weapons and armor throughout the game in a more action focused linear campaign (McAllister, 2013). This is consistent with Yee's (2007) motivational subcomponent of *role-playing* of the *immersion* component and Fullerton's (2008) typology of the *storyteller*, which drives the video game player to immensely enjoy creation and living in worlds of fantasy and imagination, focusing on the storyline, character history, and roles played in game. However, Bartle's (2004) typology does not appear to have appropriate criterion into which the video gamer's preference falls, and is consistent with past critiques (Fullerton, 2008; Radoff, 2011b; Yee, 2007). This may likely be due to how diverse the video game genres have become requiring consistent typological changes.

Simulation and strategy preference video gamers were negatively correlated with action/shooter (simulation and strategy each explain 5% of the variance), action/adventure (simulation 18% of the variance, strategy 20% of the variance), and adventure genres (simulation 6% of the variance, strategy 12% of the variance) in preference of ranking the genres. This is possibly due to the simulation genre attempting to replicate real-life scenarios and gameplay and the strategy's focus upon careful, methodical, and skillful planning in order to be victorious. The action/shooter, action/adventure, and adventure genres do not hold these intergame dynamics in high regard and rarely are seen in the genres (McAllister, 2013). Bartle's (2004) typology does not appear to have a player type into which simulation video games fall. However, simulation play appears to be most comparable for some of the video games found within the simulation genre to be attributable to the strategy's genre typology of *achievers/planners*: those who are calculating with their actions and attributing all play to be according to a larger scheme or plan. Examining Yee's (2007) typology, simulation and strategy preferred video gamers appear to be motivationally concerned with the subcomponents of *advancement* (i.e. progress, power and status), *mechanics* (i.e. numbers, optimization, and analysis), and *competition* (i.e. challenging others, provocation, and domination) found in the *achievement* component. Similarly, Fullerton's (2008) typology of the *competitor* and *achiever* appear to be found within these two genres; video gamers who play to best other players and for general achievement of gameplay.

The genre of other video games was negatively correlated with the role-playing genre ($r^2 = .05$). This may be due to a lack of character development, adventuring, and

video game exploration found in other types of video games (McAllister, 2013). As this category is a large mixture of various video games (i.e. party, music, programming) it is difficult to fit a specific typology of the video gamer into such a vast array of video games as there may be multiple typologies found within. For example, the party video games may fit into the *socializers/friends* of Bartle's (2004) typology, the *social* motivation component and subcomponents of *socializing, relationships,* and *teamwork* of Yee's (2007) typology, and Fullerton's (2008) typologies of *competitor* and *joker*. As such, the compilation of video games and their possible specific genres requires additional research.

As video gamers reported an increase in hours per week of playing video games, their days per week additionally increased. Interestingly, the number of years playing video games had no relationship with days or hours playing video games, suggesting that regardless of how long one has been playing video games, this does not relate to daily or weekly time played. Not surprisingly, the age of the video gamer was positively correlated with years playing video games and strongly suggests that the older the video gamer, the longer the gamer has played (53% of the variance). Additionally, dependent upon how the video gamers placed themselves in the category of video gamers (i.e. casual, regular, hardcore) was positively correlated with the number of days and hours per week playing video games (days played 14% of the variance, hours played 9% of the variance). This suggests that as video gamers play video games for longer periods of time and across additional days of the week, their idea of what gamer category they fall into additionally becomes clarified (e.g. from casual to regular to hardcore). This finding is important to the composition of how video gamers view themselves and possibly of

how they may view and segregate other video gamers in the field. This requires more research in order to determine whether the possible effects of personal ideology is dependent upon how often per day and week the video gamer plays and the self-identification of video gamer categories.

Of the BFI correlations, neuroticism was negatively correlated with extraversion (10% of the variance), agreeableness (7% of the variance), and conscientiousness (9% of the variance), proposing that video gamers with higher tendencies to be in a negative emotional state have fewer habits concerned with obtaining gratification from external sources. This may additionally suggest as negative emotional states increase within the video gamer, possibly from other video gamer interactions, frustration of in-game mechanics, or a continual disappointment, they become less agreeable, conscientious of the other players, and more negative with their emotional states (Cole, Michel, & Teti, 1994; Thompson, 1994). Video gamers' ability to stay emotionally modulated decreases or they become emotionally deregulated. Interestingly enough, the BFI category of openness was positively correlated with extraversion (7% of the variance), suggesting that as video gamers are more open to different experiences, they increase in extraversion as well.

T tests

The ten *t* tests resulted in eight significant findings. However, evaluating the mean differences shows how much the number of participants largely influenced the statistical evaluation. Even though there were eight significant findings, only two were over a total mean difference of two points. The *t* tests were based upon gender of the participants and gender played in the video game. The results showed the only difference

between genders was on the BFI trait of neuroticism for gender of the participant and preferred gender played. Female gamers responded with higher neuroticism scores with respect to their gender, but had substantially lower scores on preferred played gender, although significant differences were observed. This may be primarily due to demographically more men playing female characters thus lowering the neuroticism scores (see Table 2).

The higher levels of neuroticism may suggest that female gamers have more anxiety conceivably about playing in a perceived "male-dominated" area of play, even with the Entertainment Software Association (ESA) stating in their most recent report that the gender gap has diminished significantly (ESA, 2015). This constituted anxiety of playing video games and possibly causing uneasiness within the female population may be socially manufactured by terminology for female video gamers being "girl gamer" or the existence of the recent "GamerGate" scandal. Beginning in August of 2014 continuing still today, several well-known female video gamers have been subjected to a campaign of misogynistic attacks because of their feministic views of the male-dominated culture of video games. These attacks consisted of rape and death threats, hate mail, and other intimidations to a significant culmination point where many conference appearances had to be cancelled and police became involved (Dewey, 2015; Romano, 2014; Stuart, 2014; Zachary, 2015). With perceived threats to their own well-being, it is possible the female population still has anxiety and higher neuroticism when it comes to the video game realm.

MANOVAs

Five MANOVAs were conducted, with significant findings statistically emerging from each. However, the effect sizes were frequently small across the five domains of the BFI for all five MANOVAs conducted. This resulted in possible unmeaningful statistical findings when the effect sizes were quite small. Evaluating the mean differences across the participant's ethnicity, days per week playing, system of preference to play video games, and gamer category indicated very small differences across the personality scales. Conceptually, this means that there are small and possibly negligible differences among video gamers' ethnicities and that their personalities constitute a gamer personality score that is stable across different ethnicities. Additionally, regardless of how video game designated themselves (i.e. causal, regular, hardcore) there were no significant differences between the self-classification of video gamers' personalities. Furthermore, regardless of the number of days played per week, personality scores did not differ based upon the amount of time played. This likely suggests that a video gamer's personality may be more important in determining his or her behavior (i.e. exhibiting aggression and violence) and that a gamer's personality is not so much as affected by engagement with video games. These are substantial findings because of the current stereotypes that a subgroup of video gamers are aggressive, violence prone, and negatively affected by video games (Anderson & Bushman, 2001; Anderson & Dill, 2000; Arriaga et al., 2006; Dill & Dill, 1998; Funk, Buchman, Jenks, & Bechtoldt, 2003; Huesmann, 2007). These findings directly contradict the stereotype of video gamers playing video games for extended periods of time being violent or aggressive. As such, this requires more research to determine whether personality traits may be important in

creating a disposition against violence and aggression even through the playing of violent video games.

Levels of education appeared to be significant in the different personality traits of the BFI primarily in the domains of extraversion, conscientiousness, neuroticism, and openness to experience. Although the differences were small, individuals attaining additional education scored higher on openness to experience, extraversion, and conscientiousness, but lower in neuroticism. It is unclear whether age played a determining factor in this finding. Although this may not be as an important finding for the video gamer population, it does seem to suggest that as individuals attain more education and enhance themselves academically, their scores increase in societally positive domains and lessen in more problematic areas (Markey & Markey, 2010; McCrae & Costa, 1991).

Latent Profile Analysis

Four general profiles for the overall sample emerged from the LPA analysis. These profiles had multiple statistically different scores on the BFI when compared to one another signifying statistically different profiles of video gamers. This suggests that personality is a factor in understanding the video gamer on a larger and more comprehensive level. Although there are similarities, the differences that emerged require a notation of emphasis, as they infer that certain personality traits of the BFI may be of primary importance in different genres of video game play. Furthermore, it suggests that four distinct and statistically dissimilar personality formations play video games.

The four personality profiles were named Introversive, Extroversive, Secure Ambiversive, and Insecure Ambiversive because of the qualities exhibited on the BFI traits (Cohen & Schmidt, 1979; Eysenck; 1971; Goldberg, 1992; Ryckman, 2004). The Introversive profile has lower mean values in four of the BFI traits, but higher neuroticism compared to the other three profiles. This was consistent with past research on introverted individuals displaying elevated neuroticism (McCrae & Costa, 1991). The Extroversive profile had higher mean values in all traits of the BFI with the exception of neuroticism, in which it was comparatively the lowest of the four profiles. The last two profiles, Secure Ambiversive and Insecure Ambiversive, had medium scores in the BFI personality traits, with the exception of the neuroticism scores. The Insecure Ambiversive profile had neuroticism scores similar to the Introversive profile, whereas the Secure Ambiversive had scores similar to the Extroversive profile. Overall personalities found were primarily Insecure Ambiversive (29.33% of the sample), followed by Secure Ambiversive (26.33% of the sample), then Introversive (23.45% of the sample), and finally by the Extroversive profile (20.89% of the sample).

The idea of Introversion and Extraversion was first proposed as a central dimension of personality by Carl Jung (1923). This is typically viewed as a single continuum of human personality. For example, being high in one element such as extroversion means that the individual is lower in the other trait of introversion dependent upon the context of the situation for the individual. The findings of four personality profiles appearing in the sample of video gamers gives credence to Jung's ideas that the continuum is inherent in every individual and that although one typology plays a larger role, both can be present (Eysenck, 1971; Ryckman, 2004). Introversive personalities

focus on their inner psychic reality as a way of understanding the world, whereas in contrast, extroversive personalities primarily look outwards to their social environment for their grounding in life. Introversive personalities are thought to become overwhelmed and drained of their energy while connecting in face-to-face interactions socially, whereas in contrast the extroversive is revitalized (Eysenck, 1971; Jung, 1923). Extroversive personalities tend to enjoy spending most of their time in social environments, and their sense of self is based on their external interactions. They can also become bored when they are in more solitary environments because of the lack of social engagement (Jung, 1923; Ryckman, 2004). Ambiversive personalities have traits and attributes of both Extroversive and Introversive personalities, dependent upon their needs at the time (Cohen & Schmidt, 1979). It is important to note, however, that the BFI's ideas of extroversion are not conceptually based upon Jung's ideology and may differ through current psychological usage.

However, they can be considered to be similar as Jung's definition focused on an individual's orientation to psychic contents (i.e. looking to the outside world or within the individual for meaning in one's life), and the BFI is marked by an individual's interaction and engagement with the outside world (i.e. extraversion for high interaction and introversion for low engagement). In both situations, these individuals are interacting with their internal psychic mechanisms either within themselves or from the external world in attempts to make meaning and understanding of their lives (McCrae & Costa, 1991; Jung, 1923).

Ambiversive personality video gamers theoretically are moderately comfortable with groups, social interaction, being in unknown places, and generally out and about,

similar to extroversive video gamers. The important other side of an Ambiversive personality is that the person additionally enjoys and needs time away from everyone in order to recharge similar to the Introversive personality. As such, video gaming may provide the aforementioned security of still fulfilling their extroversive side, but at a safe distance through a video game in order not to overpower their intrapsychic processes and rejuvenation creating anxiety. An important discrepancy between the two Ambiversive profiles was the neuroticism elevation. The Secure Ambiversive profile had lower levels of neuroticism suggesting an ability to handle emotionally charged gameplay whereas the Insecure Ambiversive profile had higher levels of neuroticism and may not be able to adjust as easily.

Introversive personalities may utilize video games as a method of enjoyment in interacting with social environments without becoming overwhelmed or drained or as an appropriate or safe method of interpersonal interaction for Introversive personalities. Therefore, video gaming may be considered a positive social interaction for many introversive personalities contrary to societal belief (Hilgard, Engelhardt, & Bartholow, 2013). The Extroversive profile was the least found among the personality profiles, and according to past research, the most stable personality profile among them all. However, in speculation, as video gaming may be considered an isolative activity, the presence of the Extroversive profiles suggests that some extroverts may still obtain personal satisfaction from virtual worlds, just not to the same degree as Introversive personalities.

Examining which profiles were found in each of the different genres of video gaming provides more insight into which types of video gamers gravitate towards specific genres. The action/adventure genre had Introversive, Secure Ambiversive, and

Insecure Ambiversive profiles. The Introversive personality profile was found primarily suggesting that introversive video game players gravitate towards this type of genre, quite possibly due to the individualistic mechanics and low interactions with other people. The action genre primarily had Secure Ambiversive profiles, with Insecure Ambiversive profiles closely following in numbers. This may be due to the pressure to complete a task in a specific amount of given time, which Ambiversive individuals may have an easier time completing. However, even though they were lower, Introversive and Extroversive profiles were found in addition. The adventure genre only had Insecure and Secure Ambiversive profiles suggesting puzzle and nonconfrontational game play may be of importance to these personality profiles. The role-playing genre was the only genre to have all four personality profiles emerge, suggesting that while Insecure and Secure Ambiversive profiles were primarily found, Introversive was fairly close in numbers, with Extroversive being the farthest away. This may mean the role-playing genre has characteristics and meets the needs of all four personality profiles, therefore making it a versatile gaming world. As such, it may be important to research this area in more depth to examine what the draw for all four personality profiles may be. The last three genres, simulation, strategy, and other, each only had Introversive and Extroversive profiles found, suggesting that these personality types dominate these genres.

Hypotheses

In total, four hypotheses were proposed in the beginning of this dissertation:

1. It is expected that different typologies of gamers (i.e., casual, regular, hardcore users, and nongamers) will produce different personality profiles.

2. Dependent upon the video gamers' preferred genres of play, it is predicted that the different genres played will attract different personality profiles.
3. It is also hypothesized that a majority of gamers will not fit into a personality profile that is considered antisocial, high Neuroticism, low Conscientiousness, and low Agreeableness, but that individuals who enjoy competition may show more antisocial personality traits (Markey & Markey 2010).
4. Finally, a latent class analysis (LCA) will be performed to diagram out possible class associations among variables (i.e., preferred genres of play), thus creating a multifactorial map for video gamer's personality motivations for playing specific genres of video games and examining the pattern of relationships among the variables.

Hypothesis 1 did not find any support for the different classification of video gamers producing different personality profiles. In fact, the personalities of the different video game classifications (casual, regular, and hardcore) showed very small and nonsignificant differences, even with the large sample size. As such, it is important to note the possibility that regardless of the classification of the video gamer, they all have similar personalities, thus providing a cohesive sample.

Hypothesis 2 found substantial support for different personality profiles found in specific genres. Out of the four personality profiles that emerged, role-playing and action were the only genres to encompass all four personalities. This may be due to the multifaceted approach of the role-playing worlds and the allowance of video gamers to build a character based upon what they deem important, whereas the action genre challenges the video gamer in tests of physical skill, high reaction speeds, and good hand-

eye coordination in puzzling situations. There is some overlap in the two genres in the form of challenge and puzzle skill, thus providing a reason they are the only genres to have all four personality profiles.

Hypothesis 3 also found substantial support, with the video gamer personality traits being similar or higher in the case of conscientiousness and agreeableness and lower in neuroticism, to the BFI averages or norms. No personality profile found in this dissertation matched the considered antisocial personality pattern of high neuroticism, low conscientiousness, and low agreeableness (Markey & Markey, 2010). In fact, neuroticism levels within the Introversive and Insecure Ambiversive profiles were found to be higher when compared to the BFI norms, but still within one standard deviation of the BFI norm. Similar results were found with all profiles for agreeableness and conscientiousness. The profile coming closest to the proposed antisocial personality pattern was the Introversive profile, suggesting that the introverted video gamer may be most likely to show negative emotional states and lower agreeableness and conscientiousness (see Table 38).

Finally the fourth hypothesis also found support, with four different personality profiles being found from the entire sample and varied across the seven genres of video gaming in this dissertation. All four personality profiles were statistically different from one another in all domains of the BFI traits. This suggests multiple personalities play video games differentially spread across the genres.

Limitations and Future Research

The BFI is a general measure of personality that is well respected in the field, but may not be as well researched and detailed as the NEO-PI-R. As such, a more nuanced

understanding of personality and the relationship to video gamers was not available. Although this may be true, the five factor theory continues to be prominent in today's society continuously being taught at all levels of academia suggesting it is still a viable and important theory (Atkinson et al., 2000; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008). As such, utilizing the BFI provides important and current personality and theoretical information on the video gamer population.

Additional limitations within this study were the findings becoming statistically significant with small effect sizes. This created some unmeaningful findings within the MANOVAs, *T* tests, and correlations requiring careful scrutiny of the mean scores. As such, it was imperative to increase the range of statistical significance of the correlations and examine the differences of the mean scores across the MANOVAs and *T* tests. Furthermore, this is an example of statistics reaching significance but having insignificant findings.

The above limitations show an increased need to examine the personalities of gamers to discover the role of personality in influencing choices of playing video games. The author hypothesized that individuals select genres that are conducive to their personality structure *and* are nurtured further intrinsically and personality-wise by the roles played in virtual worlds. For future research, it is important to further understand whether video gamers self-select game playing roles based upon their personality dynamics, whether the possibility of playing certain avatar roles influences the development of personality, or a mixture of both. Finally, because proposed antisocial personalities were not identified, it is important to know whether this finding transcends

into other genres of video game play and requires a replication study in order to confirm the personality findings (Markey & Markey, 2010).

With the reported limitations, it is important to list the strengths of this dissertation as well. For instance, although the number of participants did influence the statistical results, creating unmeaningful statistical findings, it also is one of the largest video gamer samples to date, suggesting a very robust sample. Video gamers from all areas of gaming participated by taking the survey and sending it to their friends. This large sample enables solid generalizations about the population of video gamers, further increasing the significance of the study's findings. Given the large number of participants and the ability to generalize to the video gamer population, it is additionally impressive that this dissertation is the first to measure video gamers on such an enormous level and across age ranges.

This study additionally provides a basis for personality playing a role in virtual worlds played and thus should be examined more closely. Moreover, this study suggests the beginnings of a possible personality typology of gamers (i.e. Introversive, Extroversive, Secure and Insecure Ambiversive). As such, other genres and video games should be researched to understand if the personality profiles are consistent across the different genres of video games.

In summation, this dissertation studied one of the largest, if not the largest, samples of video gamer's personality traits. It suggested that there are significant differences between men and women primarily on the BFI trait of neuroticism, but little to no differences between men and women as regards others characteristics studied (i.e. time played, gamer self-categorization, ethnicity, systems used most, and educational

level). However, four personality profiles were extracted from the LPA: Introversive, Extroversive, Insecure Ambiversive, and Secure Ambiversive. These personality profiles were then further extrapolated across the different genres studied. As suggested by the results, it appears that certain personality patterns prefer specific genres of play, further suggesting that different individuals may gravitate towards different preferences of play. In conclusion, this dissertation provides the basis of the personality typology of the video gamer.

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Appendix A

Tables

Table 1
Overall Sample Demographics

Variable	Overall Sample N	Mean	Standard Deviation
Gender	19416	1.14	.34
Preferred Played Gender	19347	1.28	.45
Ethnicity	19413	3.20	1.14
Asian/Pacific Islander	1367	7%	
Black/African-American	186	1%	
Caucasian	15040	77.5%	
Hispanic	991	5.1%	
Native American/Alaska Native	121	.6%	
Other/Multi-Racial	1222	6.3%	
Decline to Respond	486	2.5%	
Age	19448	25.05	6.09
Years of Education	19312	14.20	2.36
High School	9153	47.2%	
GED	589	3%	
Technical College	1135	5.8%	
Associate's	1802	9.3%	
Bachelor's	4604	23.7%	
Master's	1192	6.1%	
Doctorate	284	1.5%	
I have not completed any of these choices	653	3.4%	
Hours/Week Playing VGs	19345	20.96	16.51
Days/Week Playing VGs	19382	5.61	1.61
Years Playing VGs	19367	16.31	6.24
Genres Ranked			
Action/Shooter	19312	3.72	2.03
Action/Adventure	19312	3.19	1.51
Adventure	19294	3.89	1.52
Role-Playing	19329	2.69	1.82
Simulation	19289	4.75	1.80
Strategy	19298	3.92	1.839
Other	19266	5.81	1.75
Video Gamer Classification	19349	2.24	.66
Not a Gamer	152	.8%	
Casual Gamer	1996	10.3%	
Regular Gamer	10348	53.5%	
Hardcore Gamer	6853	35.4%	

Video Game System Most Used	19350	1.42	.85
Computer	13742	71.0%	
Console	4551	23.5%	
Smart Phone	274	1.4%	
Tablet	94	.5%	
Handheld	689	3.6%	
Extraversion Score	19440	23.46	6.87
Agreeableness Score	19438	33.40	5.34
Conscientiousness Score	19437	30.95	5.77
Neuroticism Score	19438	23.88	6.75
Openness Score	19436	38.84	5.58

Table 2
Overall Sample Demographics By Gender

Variable	Male *N*	Male Mean *(SD)*	Female *N*	Female Mean *(SD)*
Gender	16749	1.00 (.00)	2667	2.00 (.00)
Preferred Played Gender	16692	1.19 (.39)	2655	1.88 (.32)
Percent Playing Each Gender	13870	71.7%	5477	28.3%
Ethnicity	16745	3.21 (1.13)	2667	3.16 (1.19)
Asian/Pacific Islander	1119	6.7%	248	9.3%
Black/African-American	146	0.9%	40	1.5%
Caucasian	13040	77.9%	1999	75.0%
Hispanic	883	5.3%	108	4.0%
Native American/Alaska Native	103	0.6%	18	0.7%
Other/Multi-Racial	1021	6.1%	201	7.5%
Decline to Respond	433	2.6%	53	2.0%
Age	16749	24.87 (6.03)	2667	26.23 (6.38)
Years of Education	16668	14.11 (2.33)	2642	14.76 (2.50)
High School	8163	48.8%	990	2.4%
GED	517	3.1%	72	37.1%
Technical College	995	5.9%	140	2.7%
Associate's	1490	8.9%	312	5.2%
Bachelor's	3794	22.7%	810	11.7%
Master's	973	5.8%	219	30.4%
Doctorate	223	1.3%	61	8.2%
I have not completed any of these choices	589	3.5%	63	2.3%
Hours/Week Playing VGs	16688	21.42 (16.63)	2656	18.11 (15.42)
Days/Week Playing VGs	16720	5.66 (1.58)	2661	5.25 (1.77)
Years Playing VGs	16707	16.32 (6.19)	2659	16.26 (6.52)
Genres Ranked				
Action/Shooter	16661	3.52 (1.97)	2651	4.99 (1.93)
Action/Adventure	16658	3.16 (1.50)	2654	3.35 (1.52)
Adventure	16642	3.99 (1.52)	2652	3.23 (1.38)
Role-Playing	16673	2.77 (1.83)	2656	2.17 (1.63)
Simulation	16639	4.84 (1.79)	2650	4.21 (1.80)
Strategy	16649	3.85 (1.85)	2649	4.38 (1.68)
Other	16621	5.84 (1.74)	2645	5.65 (1.77)
Video Gamer Classification	16694	2.28 (.64)	2655	1.93 (.68)
Not a Gamer	104	0.6%	48	1.8%
Casual Gamer	1433	8.6%	563	21.2%
Regular Gamer	8781	52.6%	1567	59.0%
Hardcore Gamer	6376	38.2%	477	18.0%
Video Game System Most Used	16695	1.37 (.76)	2655	1.75 (1.24)
Computer	12127	72.6%	1615	60.8%

Console	3895	23.3%	656	24.7%
Smart Phone	192	1.2%	82	3.1%
Tablet	57	0.3%	37	1.4%
Handheld	424	2.5%	265	10.0%
Extraversion Score	16741	23.56 (6.82)	2667	22.82 (7.10)
Agreeableness Score	16741	33.36 (5.33)	2666	33.69 (5.45)
Conscientiousness Score	16739	30.92 (5.72)	2666	31.19 (6.10)
Neuroticism Score	16739	23.29 (6.63)	2667	27.57 (6.35)
Openness Score	16738	38.42 (5.54)	2667	39.28 (5.80)

Table 3
Cronbach's Alpha for the BFI

Domain	Cronbach's Alpha	Number of Items
Extraversion	.87	8
Agreeableness	.76	9
Conscientiousness	.79	9
Neuroticism	.84	8
Openness	.74	10
All Five Domains	.72	44

Note: BFI = Big Five Inventory.

Table 4
Correlational Table

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Years Playing Videogames	1															
2 Days/Week Playing Videogames	.00	1														
3 Hours/Week Playing Videogames	-.04	.44*	1													
4 Action/Shooter	.06	-.02	-.03	1												
5 Action/Adventure	.03	.03	.03	.16	1											
6 Adventure	.00	.08	.05	-.29*	.26*	1										
7 Roleplaying	-.07	-.06	-.05	-.35*	-.17	-.01	1									
8 Simulation	-.05	.03	.03	-.23*	-.42*	-.25*	-.14	1								
9 Strategy	.02	-.03	.00	-.23*	-.45*	-.34*	-.09	.10	1							
10 Other	.00	.00	.00	-.19	-.19	-.13	-.23*	-.15	-.10	1						

11 Gamer Category	.06	.37*	.30*	-.13	-.03	.10	-.06	.10	.02	.02	1				
12 Age	.73*	-.12	-.11	.05	.07	.01	-.02	-.11	-.01	.01	-.11	1			
13 Extraversion	.03	-.10	-.08	-.08	-.04	.00	.08	.01	.00	.04	-.02	.05	1		
14 Agreeableness	.05	-.06	-.08	-.02	-.05	-.04	.02	.01	.05	.01	-.04	.04	.17	1	
15 Conscientiousness	.13	-.11	-.10	-.04	-.01	.00	.03	.00	-.03	.06	-.03	-.03	.18	.19	1
16 Neuroticism	-.04	.04	.05	.08	.01	-.06	-.07	-.04	.09	-.03	-.03	.15	-.31*	-.27*	-.30*
17 Openness	.14	-.07	-.08	.05	-.01	-.04	-.03	.00	.00	.01	.03	.03	.27*	.13	.11

Table 5
Means of Personality Scores Across Gender Overall Sample

Personality Scales	Gender	*M*	*(SD)*	*M* Difference	*p*	Cohen's *d*
Extraversion	Male	23.56	(6.82)	.74	<.001**	.11
	Female	22.82	(7.10)			
Agreeableness	Male	33.36	(5.33)	.34	.003*	.06
	Female	33.69	(5.45)			
Conscientiousness	Male	30.92	(5.72)	.28	.028	-
	Female	31.19	(6.10)			
Neuroticism	Male	23.29	(6.63)	4.28	<.001**	.66
	Female	27.57	(6.34)			
Openness	Male	38.42	(5.54)	.86	<.001**	.15
	Female	39.28	(5.80)			

Note: M = Mean, *SD* = Standard Deviation, **p* <.005, ***p* <.001, two-tailed.

Table 6
Means of Personality Scores Across Preferred Played Gender: Overall Sample

Personality Scales	Gender	*M*	*(SD)*	*M* Difference	*p*	Cohen's *d*
Extraversion	Male	23.82	(6.80)	1.30	<.001*	.19
	Female	22.52	(6.96)			
Agreeableness	Male	33.39	(5.30)	.04	.58	-
	Female	33.43	(5.47)			
Conscientiousness	Male	31.06	(5.70)	.38	<.001*	.07
	Female	30.68	(5.95)			
Neuroticism	Male	23.24	(6.61)	2.24	<.001*	.33
	Female	25.48	(6.86)			
Openness	Male	38.41	(5.52)	.43	<.001*	.08
	Female	38.84	(5.77)			

Note: M = Mean, *SD* = Standard Deviation, **p* <.001, two-tailed.

Table 7

Means and Sample Sizes of Gamer Self-Categorization, Systems Used Most, Days/Week Playing VGs, Ethnicity, and Educational Level Across the BFI Domains of Personality

Domain	*N*	E* *M*	A* *M*	C* *M*	N* *M*	O* *M*
Gamer Category						
Casual	1993	24.20[1]	38.82[1]	31.69[1]	24.30[1]	38.38
Regular	10341	23.35[1]	33.55[1]	30.93[1]	23.89	38.42[1]
Hardcore	6838	23.39[1]	33.07[1]	60.80[1]	23.69[1]	38.77[1]
Systems Used Most						
Computer	13632	23.15[1]	33.23[1]	30.70[1]	23.79[1]	38.44[1]
Console	4525	24.38[1]	33.92[1]	31.75[1]	23.79[1]	38.80[1]
Smart Phone	249	25.24[1]	33.44	31.49	23.92[1]	38.73
Tablet	87	25.66[1]	33.90	32.85[1]	24.00	39.01
Handheld	679	22.44[1]	33.41	30.46[1]	25.84[1]	38.77
Days/Week Playing VGs						
1	293	24.44[1]	33.54	31.92[1]	23.83	38.35
2	763	24.17[1]	33.70[1]	32.05[1,2]	23.81	39.07[1]
3	1389	24.46[1,2]	34.06[1]	32.01[1,2]	23.59	39.24[1]
4	1896	24.56[1,2]	33.78[1]	31.81[1,2]	23.24[1]	39.29[1,2]
5	3373	24.02,[1]	33.80[1]	31.44[1,2]	23.76	38.88[1]
6	2917	23.52[1,2]	33.56[1]	30.86[1,2]	23.50[1]	38.69[1,2]
7	8540	22.70[1]	33.98[1]	30.31[1]	24.21[1]	38.04[1]
Ethnicity						
Asian/Pacific Islander	1346	22.77[1,2]	32.83[1]	29.81[1]	24.73[1]	37.11[1]
Black/African American	183	22.02[1]	33.72	30.28	22.28[1]	38.77[1]
Caucasian	14873	23.48[1,2]	33.47[1]	31.12[1]	23.80[1]	38.64[1]
Hispanic	972	23.40	33.68[1]	30.73[1]	23.50[1]	38.46[1]
Native American/Alaska Native	120	23.13	33.68	30.52	24.13	38.32
Other/Multiracial	1204	24.24[1]	33.24	30.76[1]	24.08	38.93[1]
Educational Level						
No Completion	639	22.58[1,2,3]	32.13[1]	28.98[1]	24.96[1]	37.63[1,2]
High School	9044	23.02[1,2,3]	33.20[1,2]	30.01[1,2]	24.26[1]	37.97[1,2]
GED	582	22.97[1,2]	33.30[1]	30.27[1,2]	24.79[1]	38.41[2]
Technical College	1114	23.58[1]	33.59[1]	31.39[1,2,3]	23.92[2]	38.30[1,2]
Associate's	1790	23.76[1]	33.89[1,2]	31.96[1,2,4]	23.35[1]	39.10[1,2]
Bachelor's	4553	23.92[1,3]	33.68[1,2]	32.09[1,2,3,4]	23.31[1]	39.22[1,2]
Master's	1174	24.59[2]	33.79[1]	32.65[1,2,3]	22.99[1]	40.00[1,2]
Doctorate	276	25.59[1]	33.44	33.93[1,2,3,4]	22.21[1,2]	39.64[1]

Note: [1,2,3,4]= Statistically Significant From Each Other, *N* = Number of Participants, *M* = Mean, VGs = Video Games, E = Extraversion, A = Agreeableness, C = Conscientiousness, N =Neuroticism, O = Openness to Experience.

Table 8

MANOVA Across Gamer Self-Categorization, Systems Primarily Played, Days/Week Playing VGs, and Educational Level

Domain	Pillai's Value	*p*	Power
Gamer Category	.010	<.001*	1.00
Systems Played Most	.019	<.001*	1.00
Days/Week Playing VGs	.028	<.001*	1.00
Participant Ethnicity	.012	<.001*	1.00
Educational Level	.052	<.001*	1.00

Note: VG = Video Game, * $p < .001$.

Table 9

Means of Personality Scores Across Gamer Self-Categorization

Personality Scales	Play Style	*M*	*(SD)*	*p*	Power
Extraversion	CG*	24.20[1]	(6.99)	<.001**	.987
	RG*	23.35[1]	(6.75)		
	HG*	23.39[1]	(6.97)		
Agreeableness	CG*	33.82[1]	(5.10)	<.001**	1.00
	RG*	33.55[1]	(5.20)		
	HG*	33.07[1]	(5.61)		
Conscientiousness	CG*	31.69[1]	(5.67)	<.001**	.999
	RG*	30.93[1]	(5.70)		
	HG*	30.80[1]	(5.90)		
Neuroticism	CG*	24.30[1]	(6.79)	.001*	.769
	RG*	23.89	(6.70)		
	HG*	23.69[1]	(6.81)		
Openness	CG*	38.38	(5.82)	<.001**	.914
	RG*	38.42[1]	(5.49)		
	HG*	38.77[1]	(5.63)		

Note: [1]= MANOVA Statistically Significant, *M* = Mean, *SD* = Standard Deviation, **p* =.001, ** *p* < .001, CG = Casual Gamer, RG = Regular Gamer, HG = Hardcore Gamer.

Table 10

Means of Personality Scores Across Systems Used Most To Play Video Games

Personality Scales	System Preference	*M*	*(SD)*	*p*	Power
Extraversion	Computer	23.15[1]	(6.81)	<.001**	1.00
	Console	24.38[1]	(6.91)		
	Smart Phone	25.24[1]	(6.72)		
	Tablet	25.66[1]	(6.97)		
	Handheld	22.43[1]	(6.95)		
Agreeableness	Computer	33.23[1]	(5.36)	<.001**	1.00
	Console	33.92[1]	(5.25)		
	Smart Phone	33.44	(5.50)		
	Tablet	33.90	(5.33)		
	Handheld	33.41	(5.42)		
Conscientiousness	Computer	30.70[1]	(5.82)	<.001**	1.00
	Console	31.75[1]	(5.53)		
	Smart Phone	31.49	(5.76)		
	Tablet	32.85[1]	(5.53)		
	Handheld	30.46[1]	(5.89)		
Neuroticism	Computer	23.79[1]	(6.73)	<.001**	1.00
	Console	23.79[1]	(6.72)		
	Smart Phone	23.92[1]	(6.98)		
	Tablet	24.00	(6.90)		
	Handheld	25.84[1]	(6.92)		
Openness	Computer	38.44[1]	(5.59)	.002*	.790
	Console	38.80[1]	(5.55)		
	Smart Phone	38.73	(5.96)		
	Tablet	39.01	(6.34)		
	Handheld	38.77	(5.41)		

Note: [1,2]= MANOVA Statistically Significant, *M* = Mean, *SD* = Standard Deviation, **p* =.001, ** *p* < .001.

Table 11

Means of Personality Scores Across Days/Week Playing Video Games

Personality Scales	Days/Week	*M*	*(SD)*	*p*	Power
Extraversion	1	24.44[1]	(6.32)	<.001*	1.00
	2	24.17[1]	(6.77)		
	3	24.46[1,2]	(6.85)		
	4	24.56[1,2]	(6.75)		
	5	24.02[1]	(6.89)		
	6	23.52[1,2]	(6.64)		
	7	22.70[1]	(6.89)		
Agreeableness	1	33.54	(5.08)	<.001*	1.00
	2	33.70[1]	(5.03)		
	3	34.06[1]	(5.10)		
	4	33.78[1]	(5.07)		
	5	33.80[1]	(5.08)		
	6	33.56[1]	(5.20)		
	7	32.98[1]	(5.59)		
Conscientiousness	1	31.92[1]	(5.85)	<.001*	1.00
	2	32.05[1,2]	(5.44)		
	3	32.01[1,2]	(5.41)		
	4	31.81[1,2]	(5.66)		
	5	31.44[1,2]	(5.52)		
	6	30.86[1,2]	(5.60)		
	7	30.31[1]	(5.96)		
Neuroticism	1	23.83	(6.64)	<.001*	1.00
	2	23.81	(6.60)		
	3	23.59	(6.65)		
	4	23.24[1]	(6.73)		
	5	23.76	(6.67)		
	6	23.50[1]	(6.71)		

	7	24.21[1]	(6.82)		
	1	38.35	(6.12)		
	2	39.07[1]	(5.50)		
	3	39.24[1]	(5.50)		
Openness	4	39.29[1,2]	(5.22)	<.001*	1.00
	5	38.88[1]	(5.40)		
	6	38.69[1,2]	(5.46)		
	7	38.04[1]	(5.72)		

Note: [1,2]= MANOVA Statistically Significant, *M* = Mean, *SD* = Standard Deviation, * *p* < .001.

Table 12

Means of Personality Scores Across Participant Ethnicity

Personality Scales	Ethnicity	*M*	*(SD)*	*p*	Power
Extraversion	A/PI*	22.77[1,2]	(6.36)	<.001*	.996
	B/AA*	22.02[1]	(6.88)		
	C*	23.48[1,2]	(6.91)		
	H*	23.40	(7.04)		
	NA/AN*	23.13	(6.82)		
	O/MR*	24.24[1]	(6.73)		
Agreeableness	A/PI*	32.83[1]	(5.89)	<.001*	.908
	B/AA*	33.72	(5.82)		
	C*	33.47[1]	(5.31)		
	H*	33.68[1]	(5.25)		
	NA/AN*	33.68	(5.60)		
	O/MR*	33.24	(5.51)		
Conscientiousness	A/PI*	29.81[1]	(5.77)	<.001*	1.00
	B/AA*	30.28	(6.26)		
	C*	31.12[1]	(5.76)		
	H*	30.73[1]	(5.73)		
	NA/AN*	30.62	(5.76)		
	O/MR*	30.76[1]	(5.75)		
Neuroticism	A/PI*	24.73[1]	(6.35)	<.001*	.996
	B/AA*	22.28[1]	(7.08)		
	C*	23.80[1]	(6.79)		
	H*	23.50[1]	(6.57)		
	NA/AN*	24.13	(6.09)		
	O/MR*	24.08	(6.81)		
Openness	A/PI*	37.11[1]	(5.52)	<.001*	1.00
	B/AA*	38.77[1]	(5.52)		
	C*	38.64[1]	(5.57)		

H*	38.47[1]	(5.37)
NA/AN*	38.32	(5.96)
O/MR*	38.93[1]	(5.61)

Note: 1,2= MANOVA Statistically Significant, *M* = Mean, *SD* = Standard Deviation, A/PI = Asian/Pacifica Islander, B/AA = Black/African American, C = Caucasian, H = Hispanic, NA/AN = Native American/Alaska Native, O/MR = Other/Multi-Racial, * $p <$ .001.

Table 13

Means of Personality Scores Across Participant Educational Level

Personality Scales	Education	*M*	*(SD)*	*p*	Power
Extraversion	No Completion	22.58[1,2,3]	(6.62)	<.001*	1.00
	High School	23.02[1,2,3]	(6.78)		
	GED	22.97[1,2]	(6.78)		
	Tech School	23.58[1]	(6.68)		
	Associates	23.76[1]	(6.98)		
	Bachelors	23.92[1,3]	(6.97)		
	Masters	24.59[2]	(6.87)		
	Doctorate	25.58[1]	(7.10)		
Agreeableness	No Completion	32.13[1]	(5.74)	<.001*	1.00
	High School	33.20[1,2]	(5.38)		
	GED	33.30[1]	(5.24)		
	Tech School	33.59[1]	(5.12)		
	Associates	33.88[1,2]	(5.30)		
	Bachelors	33.68[1,2]	(5.29)		
	Masters	33.79[1]	(5.21)		
	Doctorate	33.44	(5.40)		
Conscientiousness	No Completion	29.98[1]	(6.15)	<.001*	1.00
	High School	30.02[1,2]	(5.73)		
	GED	30.27[1,2]	(5.89)		
	Tech School	31.39[1,2,3]	(5.41)		
	Associates	31.96[1,2,4]	(5.65)		
	Bachelors	32.09[1,2,3,4]	(5.50)		
	Masters	32.66[1,2,3]	(5.64)		
	Doctorate	33.93[1,2,3,4]	(5.66)		
Neuroticism	No Completion	24.96[1]	(6.72)	<.001*	1.00
	High School	24.26[1]	(6.63)		
	GED	24.79[1]	(6.98)		

	Tech School	23.91[2]	(6.55)		
	Associates	23.35[1]	(6.97)		
	Bachelors	23.31[1]	(6.84)		
	Masters	22.99[1]	(6.69)		
	Doctorate	22.21[1,2]	(6.72)		
Openness	No Completion	37.63[1,2]	(5.77)	<.001*	1.00
	High School	37.97[1,2]	(5.66)		
	GED	38.41[2]	(5.25)		
	Tech School	38.30[1,2]	(5.23)		
	Associates	39.10[1,2]	(5.42)		
	Bachelors	39.22[1,2]	(5.42)		
	Masters	40.00[1,2]	(5.40)		
	Doctorate	39.64[1]	(5.85)		

Note: [1,2,3,4]= MANOVA Statistically Significant, *M* = Mean, *SD* = Standard Deviation, * $p < .001$.

Table 14

Model Fit of the Latent Profile Analysis for the Entire Sample of Video Gamers, N = 19,164

Number of Classes	AIC	BIC	sBIC	LMRT (*p*-value)	BLRT (*p*-value)	Entropy
1 class	2522276	2522968	2522689	-	-	-
2 classes	2456258	2457304	2456881	.33	<.001	.859
3 classes	2433835	2435235	2434669	<.001	<.001	.849
4 classes	2414210	2415963	2415255	<.001	<.001	.854
5 classes	2401849	2403956	2403104	<.001	<.001	.859
6 classes	2392281	2394742	2393747	<.001	<.001	.863
7 classes	2383618	2386432	2385294	.08	<.001	.863
8 classes	2375908	2379076	2377795	.13	<.001	.862

Note: AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Adjusted LRT Test, BLRT = Bootstrapped Lo-Mendell Rubin Test, Entropy = Classification Quality, *p* = significance, N = Number of participants.

Table 15

Means and Standard Deviations of the BFI Domains for the Four Latent Classes Observed in the Entire Sample

Profiles	*N*	**E*** M (*SD*)	**A*** M (*SD*)	**C*** M (*SD*)	**N*** M (*SD*)	**O*** M (*SD*)
Introversive	4,493	16.17 (2.70)	30.81 (2.94)	27.59 (3.01)	29.90 (2.99)	36.20 (3.14)
Secure Ambiversive	5,046	19.90 (2.70)	34.54 (2.94)	33.23 (3.01)	20.05 (2.99)	37.43 (3.14)
Extroversive	4,004	30.98 (2.70)	36.38 (2.94)	34.29 (3.01)	20.17 (2.99)	41.10 (3.14)
Insecure Ambiversive	5,621	27.09 (2.70)	32.38 (2.94)	29.27 (3.01)	27.20 (2.99)	39.59 (3.14)

Note: N = Number of Participants, *M* = Mean, *SD* = Standard Deviation, E = Extraversion, A = Agreeableness, C = Conscientiousness, N =Neuroticism, O = Openness to Experience.

Table 16

Mean Probabilities of Latent Class Membership: Entire Sample, N = 19,164

Latent Profile	*N*	%	Latent Profile			
			Introversive	Secure Ambiversive	Extroversive	Insecure Ambiversive
Introversive	4,493	23.5	.930	.038	.000	.032
Secure Ambiversive	5,046	26.3	.038	.901	.025	.037
Extroversive	4,004	20.9	.000	.029	.929	.042
Insecure Ambiversive	5,621	29.3	.026	.033	.030	.911

Note: N = Number of Participants; % = Percentage of Participants in Class.

Table 17

Model Fit of the Latent Profile Analysis for the Sample of Action/Adventure Video Gamers, N = 2,641

Number of Classes	AIC	BIC	sBIC	LMRT (*p*-value)	BLRT (*p*-value)	Entropy
1 class	341878	342395	342115	-	-	-
2 classes	333014	333796	333373	<.001	<.001	.862
3 classes	330086	331132	330567	.04	<.001	.847
4 classes	327548	328859	328151	.34	<.001	.851

Note: AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Adjusted LRT Test, BLRT = Bootstrapped Lo-Mendell Rubin Test, Entropy = Classification Quality, *p* = significance, *N* = Number of participants.

Table 18

Mean Probabilities of Latent Class Membership: Action/Adventure Sample, N = 2,641

Latent Profile	*N*	%	Latent Profile		
			Introversive	Insecure Ambiversive	Secure Ambiversive
Introversive	987	37.4	.945	.037	.018
Insecure Ambiversive	795	30.1	.052	.903	.045
Secure Ambiversive	859	32.5	.017	.044	.940

Note: N = Number of Participants; % = Percentage of Participants in Class.

Table 19

Means and Standard Deviations of the BFI Domains for the Four Latent Classes Observed in the Action/Adventure Sample

Profiles	*N*	**E*** M (*SD*)	**A*** M (*SD*)	**C*** M (*SD*)	**N*** M (*SD*)	**O*** M (*SD*)
Introversive	987	17.25 (2.76)	32.92 (2.85)	29.93 (2.98)	26.29 (3.10)	36.62 (3.04)
Insecure Ambiversive	795	26.84 (2.76)	31.96 (2.85)	28.24 (2.98)	26.93 (3.10)	39.79 (3.04)
Secure Ambiversive	859	28.27 (2.76)	36.76 (2.85)	34.34 (2.98)	17.86 (3.10)	40.67 (3.04)

Note: N = Number of Participants, *M* = Mean, *SD* = Standard Deviation.

Table 20

Model Fit of the Latent Profile Analysis for the Sample of Action Video Gamers, N = 3,582

Number of Classes	AIC	BIC	sBIC	LMRT (*p*-value)	BLRT (*p*-value)	Entropy
1 class	470564	471108	470829	-	-	-
2 classes	457047	457869	457447	<.001	<.001	.871
3 classes	452790	453891	453325	<.001	<.001	.857
4 classes	449005	450384	449676	.001	<.001	.861
5 classes	446923	448580	447729	.34	<.001	.867
6 classes	445152	447088	446093	.11	<.001	.867

Note: AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Adjusted LRT Test, BLRT = Bootstrapped Lo-Mendell Rubin Test, Entropy = Classification Quality, *p* = significance, *N* = Number of participants.

Table 21

Mean Probabilities of Latent Class Membership: Action Sample, N = 3,582

Latent Profile	*N*	%	Latent Profile			
			Introversive	Insecure Ambiversive	Extroversive	Secure Ambiverisve
Introversive	596	16.6	.928	.027	.000	.045
Insecure Ambiversive	1,026	28.6	.014	.914	.036	.035
Extroversive	912	25.5	.000	.040	.933	.026
Secure Ambiversive	1,048	29.3	.029	.039	.021	.912

Note: N = Number of Participants; % = Percentage of Participants in Class.

Table 22

Means and Standard Deviations of the BFI Domains for the Four Latent Classes Observed in the Action Sample

Profiles	*N*	**E*** M (*SD*)	**A*** M (*SD*)	**C*** M (*SD*)	**N*** M (*SD*)	**O*** M (*SD*)
Introversive	596	16.98 (2.73)	29.55 (2.86)	25.90 (2.89)	30.40 (3.04)	34.89 (3.16)
Insecure Ambiversive	1026	28.34 (2.73)	32.25 (2.86)	29.77 (2.89)	25.85 (3.04)	35.03 (3.16)
Extroversive	912	30.23 (2.73)	36.80 (2.86)	35.35 (2.89)	16.42 (3.04)	40.72 (3.16)
Secure Ambiversive	1048	19.42(2.73)	34.58 (2.86)	32.94 (2.89)	22.74 (3.04)	36.41 (3.16)

Note: N = Number of Participants, *M* = Mean, *SD* = Standard Deviation.

Table 23

Model Fit of the Latent Profile Analysis for the Sample of Adventure Video Gamers, N = 917

Number of Classes	AIC	BIC	sBIC	LMRT (*p*-value)	BLRT (*p*-value)	Entropy
1 class	120134	120559	120279	-	-	-
2 classes	117276	117917	117495	<.01	<.001	.851
3 classes	116190	117049	116483	.51	<.001	.853
4 classes	115297	116372	115664	.21	<.001	.872
5 classes	114662	115954	115103	.63	<.001	.882
6 classes	114224	115733	114739	.67	<.001	.885

Note: AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Adjusted LRT Test, BLRT = Bootstrapped Lo-Mendell-Rubin Test, Entropy = Classification Quality, *p* = significance, *N* = Number of participants.

Table 24

Mean Probabilities of Latent Class Membership: Adventure Genre Sample, N = 917

Latent Profile	*N*	%	Latent Profiles	
			Insecure Ambiversive	Secure Ambiversive
Insecure Ambiversive	487	53.1	.957	.043
Secure Ambiversive	430	46.9	.041	.959

Note: LC1 = Latent Class 1; LC2 = Latent Class 2; *N* = Number of Participants; % = Percentage of Participants in Class.

Table 25

Means and Standard Deviations of the BFI Domains for the Two Latent Classes Observed in the Adventure Genre

Profiles	*N*	**E*** M (*SD*)	**A*** M (*SD*)	**C*** M (*SD*)	**N*** M (*SD*)	**O*** M (*SD*)
Insecure Ambiversive	487	19.68 (3.01)	31.61 (2.97)	31.87 (3.11)	27.79 (3.17)	37.55 (3.06)
Secure Ambiversive	430	27.84 (3.01)	35.97 (2.97)	33.13 (3.11)	20.72 (3.17)	41.45 (3.06)

Note: N = Number of Participants, *M* = Mean, *SD* = Standard Deviation.

Table 26

Model Fit of the Latent Profile Analysis for the Sample of Role-Playing Video Gamers, N = 7,282

Number of Classes	AIC	BIC	sBIC	LMRT (*p*-value)	BLRT (*p*-value)	Entropy
1 class	957640	958246	957967	-	-	-
2 classes	932954	933870	933448	<.001	<.001	.861
3 classes	923867	925094	924528	<.001	<.001	.858
4 classes	916268	917805	917096	<.001	<.001	.861
5 classes	911216	913064	912212	.05	<.001	.864
6 classes	907574	909731	908737	.09	<.001	.868

Note: AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Adjusted LRT Test, BLRT = Bootstrapped Lo-Mendell Rubin Test, Entropy = Classification Quality, *p* = significance, *N* = Number of participants.

Table 27

Mean Probabilities of Latent Class Membership: Role-Playing Sample, N = 7,282

			Latent Profile			
Latent Profile	*N*	%	Secure Ambiversive	Extroversive	Introversive	Insecure Ambiversive
Secure Ambiversive	1,927	26.4	.906	.024	.037	.033
Extroverisve	1,410	19.3	.031	.926	.000	.043
Introversive	1,895	26.1	.034	.000	.933	.034
Insecure Ambiversive	2,050	28.2	.025	.027	.028	.920

Note: N = Number of Participants; % = Percentage of Participants in Class.

Table 28

Means and Standard Deviations of the BFI Domains for the Four Latent Classes Observed in the Role-Playing Sample

Profiles	*N*	**E*** M (*SD*)	**A*** M (*SD*)	**C*** M (*SD*)	**N*** M (*SD*)	**O*** M (*SD*)
Secure Ambiversive	1,927	19.76 (2.70)	34.32 (2.96)	33.31 (3.02)	19.87 (2.97)	37.72 (3.11)
Extroverisve	1,410	31.08 (2.70)	36.20 (2.96)	33.97 (3.02)	17.83 (2.97)	41.03 (3.11)
Introversive	1,895	15.81 (2.70)	31.16 (2.96)	27.16 (3.02)	30.07 (2.97)	36.38 (3.11)
Insecure Ambiversive	2,050	26.60 (2.70)	32.41 (2.96)	29.16 (3.02)	28.12 (2.97)	40.21 (3.11)

Note: N = Number of Participants, *M* = Mean, *SD* = Standard Deviation.

Table 29

Model Fit of the Latent Profile Analysis for the Sample of Simulation Video Gamers, N = 1,115

Number of Classes	AIC	BIC	sBIC	LMRT (*p*-value)	BLRT (*p*-value)	Entropy
1 class	146535	146977	146697	-	-	-
2 classes	142958	143625	143202	<.001	<.001	.844
3 classes	141601	142494	141928	.40	<.001	.852
4 classes	140571	141689	140981	.37	<.001	.862
5 classes	139798	141143	140292	.34	<.001	.875

Note: AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Adjusted LRT Test, BLRT = Bootstrapped Lo-Mendell Rubin Test, Entropy = Classification Quality, *p* = significance, *N* = Number of participants.

Table 30

Mean Probabilities of Latent Class Membership: Simulation Genre Sample, N = 1,115

			Latent Profiles	
Latent Profile	*N*	%	Introversive	Extroversive
Introversive	537	48.2	.951	.049
Extroversive	577	51.8	.047	.953

Note: N = Number of Participants; % = Percentage of Participants in Class.

Table 31

Means and Standard Deviations of the BFI Domains for the Two Latent Classes Observed in the Simulation Genre

Profiles	*N*	**E*** M (*SD*)	**A*** M (*SD*)	**C*** M (*SD*)	**N*** M (*SD*)	**O*** M (*SD*)
Introversive	537	19.61 (3.10)	31.89 (2.97)	28.86 (3.06)	28.22 (3.13)	36.56 (3.15)
Extroversive	577	31.20 (3.10)	35.03 (2.97)	33.09 (3.06)	19.70 (3.13)	40.60 (3.15)

Note: N = Number of Participants, *M* = Mean, *SD* = Standard Deviation.

Table 32

Model Fit of the Latent Profile Analysis for the Sample of Strategy Video Gamers, N = 2,320

Number of Classes	AIC	BIC	sBIC	LMRT (*p*-value)	BLRT (*p*-value)	Entropy
1 class	308280	308786	308507	-	-	-
2 classes	300768	601533	301110	<.001	<.001	.855
3 classes	298207	299230	298665	.07	<.001	.845
4 classes	296123	297405	296696	.08	<.001	.855

Note: AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Adjusted LRT Test, BLRT = Bootstrapped Lo-Mendell Rubin Test, Entropy = Classification Quality, *p* = significance, *N* = Number of participants.

Table 33

Mean Probabilities of Latent Class Membership: Strategy Genre Sample, N = 2,320

			Latent Profiles	
Latent Profile	*N*	%	Introversive	Extroversive
Introversive	1,062	45.8	.958	.042
Extroversive	1,258	54.2	.042	.958

Note: N = Number of Participants; % = Percentage of Participants in Class.

Table 34

Means and Standard Deviations of the BFI Domains for the Two Latent Classes Observed in the Strategy Genre

Profiles	*N*	**E*** M (*SD*)	**A*** M (*SD*)	**C*** M (*SD*)	**N*** M (*SD*)	**O*** M (*SD*)
Introversive	1,062	18.65 (2.97)	30.61 (3.06)	29.08 (3.15)	26.65 (3.25)	36.72 (3.21)
Extroversive	1,258	27.85 (2.97)	34.75 (3.06)	32.75 (3.15)	19.58 (3.25)	39.79 (3.21)

Note: N = Number of Participants, *M* = Mean, *SD* = Standard Deviation.

Table 35

Model Fit of the Latent Profile Analysis for the Sample of Other Video Gamers, N = 972

Number of Classes	AIC	BIC	sBIC	LMRT (*p*-value)	BLRT (*p*-value)	Entropy
1 class	130165	130594	130315	-	-	-
2 classes	126819	127468	127046	<.001	<.001	.870
3 classes	125658	126527	125961	.63	<.001	.867
4 classes	124716	125804	125095	.18	<.001	.876

Note: AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Adjusted LRT Test, BLRT = Bootstrapped Lo-Mendell Rubin Test, Entropy = Classification Quality, *p* = significance, *N* = Number of participants.

Table 36

Mean Probabilities of Latent Class Membership: Other Genre Sample, N = 972

			Latent Profiles	
Latent Profile	*N*	%	Introversive	Extroversive
Introversive	476	49	.964	.036
Extroversive	496	51	.043	.957

Note: N = Number of Participants; % = Percentage of Participants in Class.

Table 37

Means and Standard Deviations of the BFI Domains for the Two Latent Classes Observed in the Other Genre

Profiles	*N*	**E*** M (*SD*)	**A*** M (*SD*)	**C*** M (*SD*)	**N*** M (*SD*)	**O*** M (*SD*)
Introversive	476	18.37 (2.89)	31.45 (3.10)	28.37 (3.17)	27.33 (3.33)	36.31 (3.24)
Extroversive	496	28.41 (2.89)	35.57 (3.10)	32.28 (3.17)	20.77 (3.33)	40.06 (3.24)

Note: N = Number of Participants, *M* = Mean, *SD* = Standard Deviation.

Table 38

Means and Standard Deviations of the BFI Domains for the Four Latent Classes Observed and the BFI Means

Profiles	*N*	**E*** M (*SD*)	**A*** M (*SD*)	**C*** M (*SD*)	**N*** M (*SD*)	**O*** M (*SD*)
Introversive	4,493	16.17 (2.70)	30.81 (2.94)	27.59 (3.01)	29.90 (2.99)	36.20 (3.14)
Secure Ambiversive	5,046	19.90 (2.70)	34.54 (2.94)	33.23 (3.01)	20.05 (2.99)	37.43 (3.14)
Extroversive	4,004	30.98 (2.70)	36.38 (2.94)	34.29 (3.01)	20.17 (2.99)	41.10 (3.14)
Insecure Ambiversive	5,621	27.09 (2.70)	32.38 (2.94)	29.27 (3.01)	27.20 (2.99)	39.59 (3.14)
Big Five Inventory	71,867	25.99 (7.20)	34.40 (6.08)	33.54 (6.40)	25.06 (6.91)	38.97 (6.89)

Note: N = Number of Participants, *M* = Mean, *SD* = Standard Deviation, E = Extraversion, A = Agreeableness, C = Conscientiousness, N =Neuroticism, O = Openness to Experience.

Appendix B

Figures

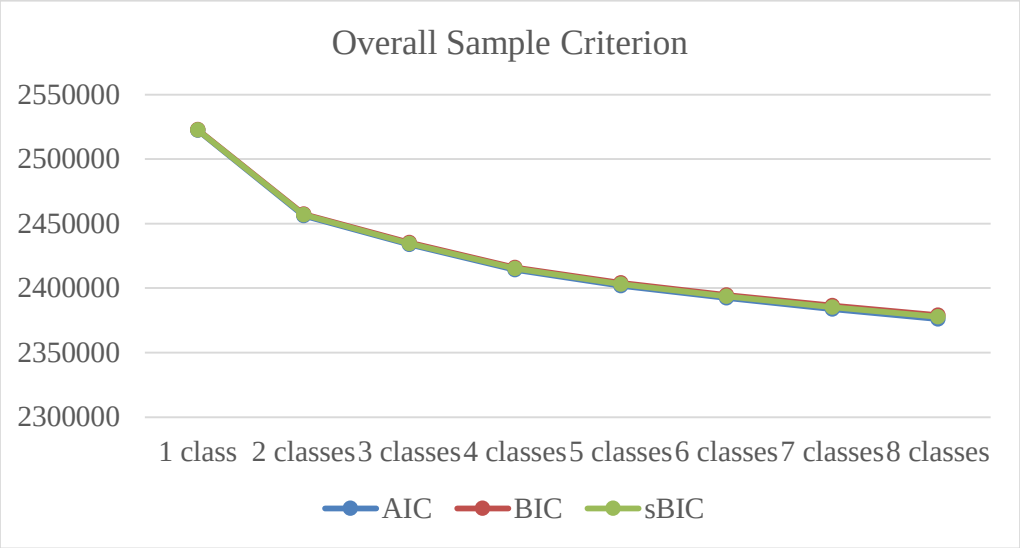

Figure 1. Overall Sample Criterion. *Note:* AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information.

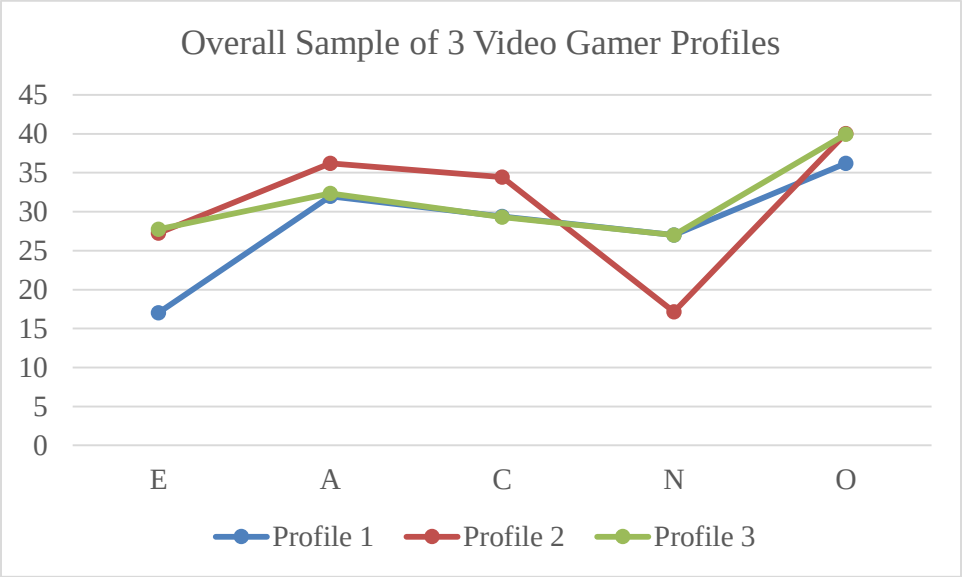

Figure 2. Overall sample of three video gamer profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N =Neuroticism, O = Openness to Experience.

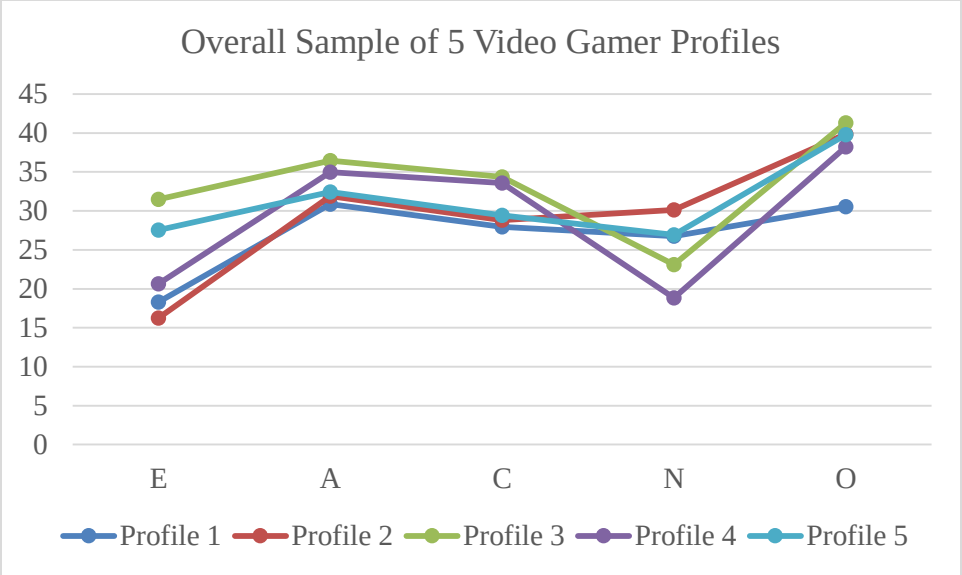

Figure 3. Overall sample of five video gamer profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

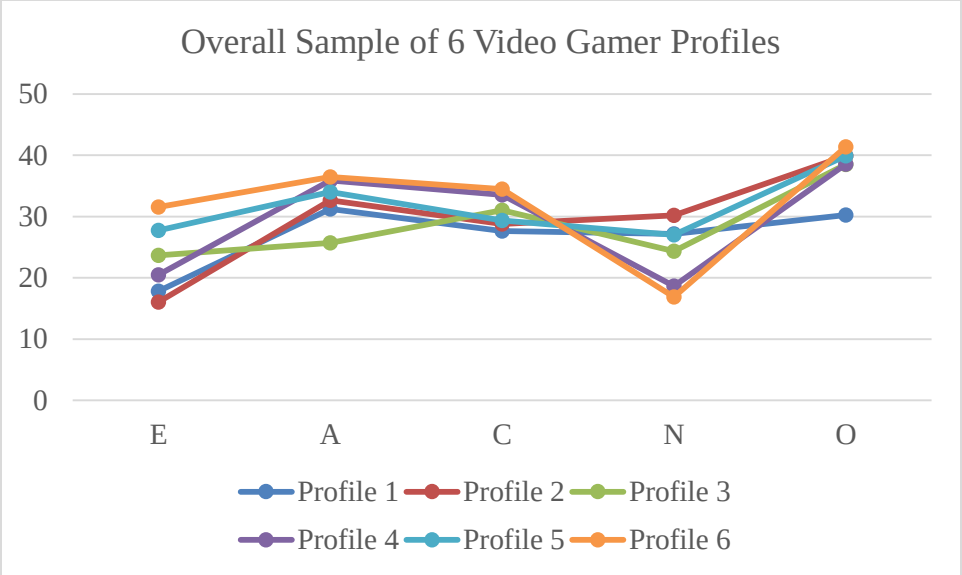

Figure 4. Overall sample of six video gamer profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

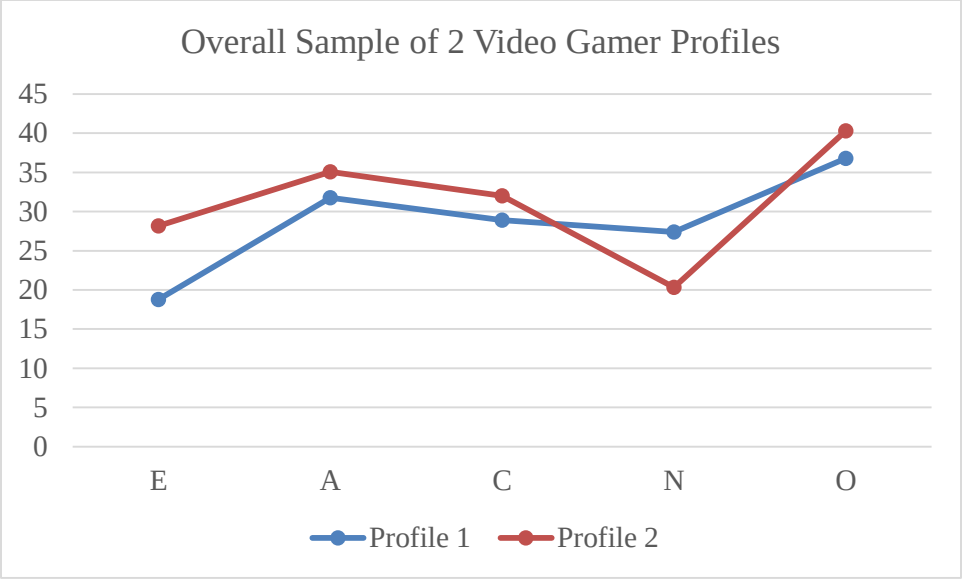

Figure 5. Overall sample of two video gamer profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

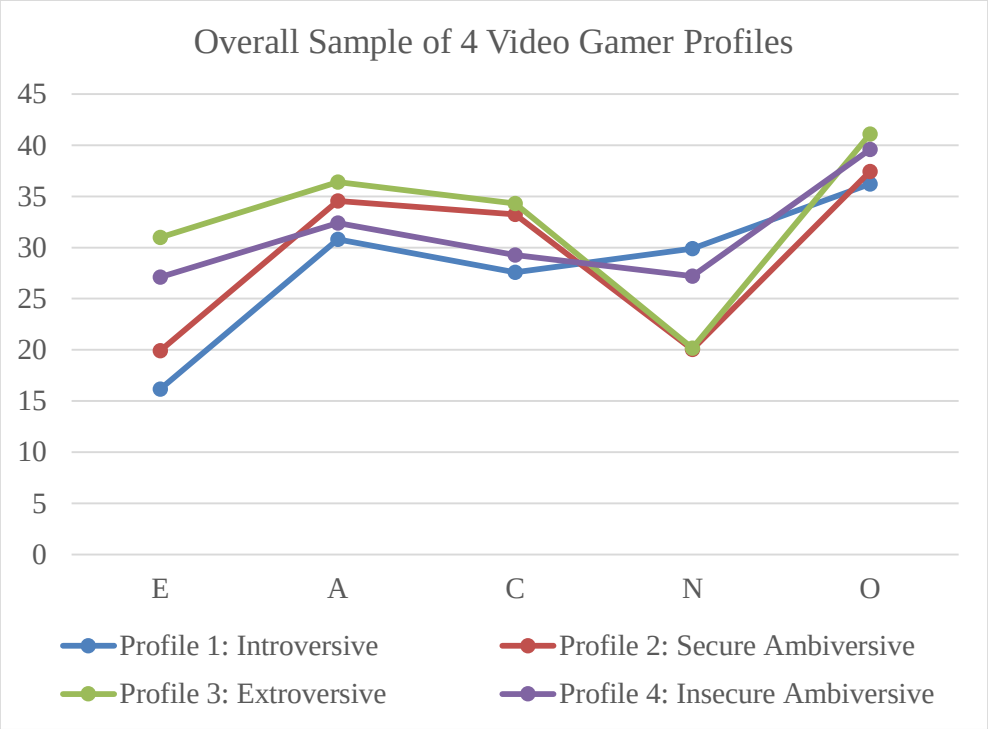

Figure 6. Overall sample of four video gamer profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

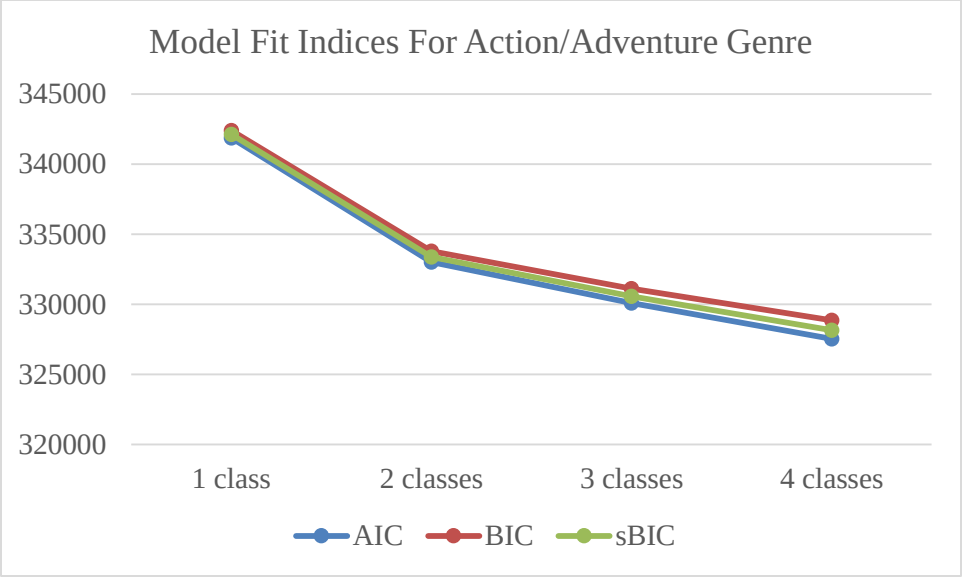

Figure 7. Model fit indices for the Action/adventure genre. *Note:* AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information.

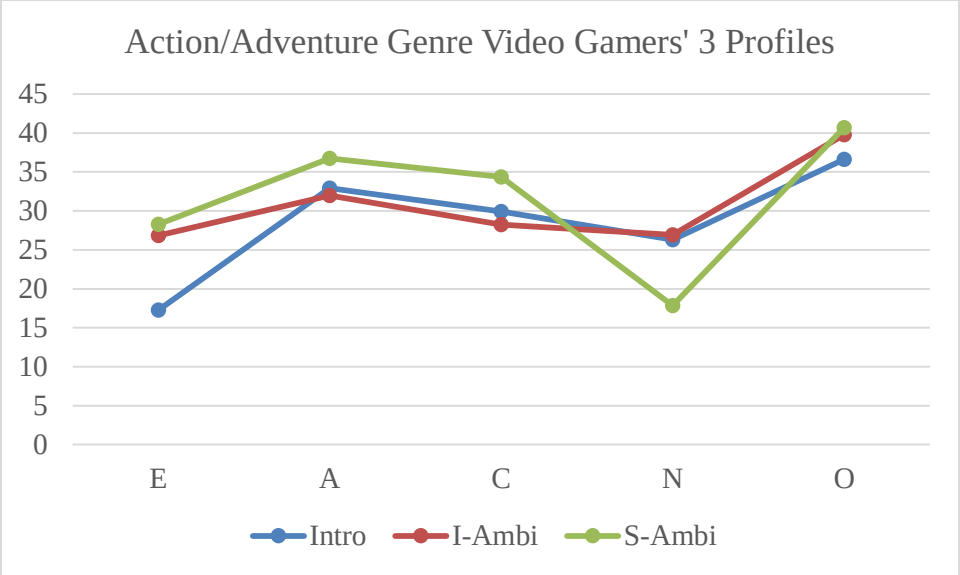

Figure 8. Action/adventure genre video gamers' identified profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

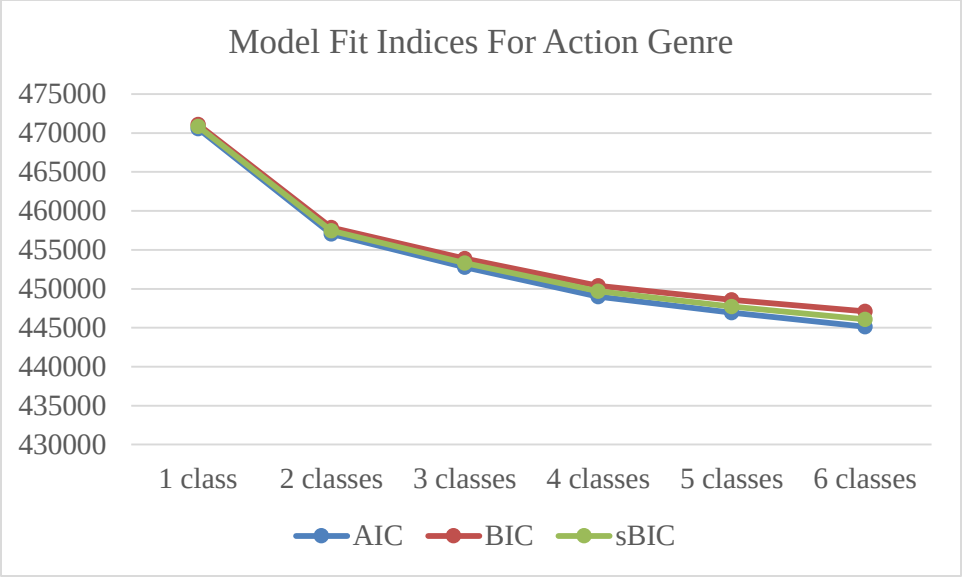

Figure 9. Model fit indices for the action genre. *Note:* AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information.

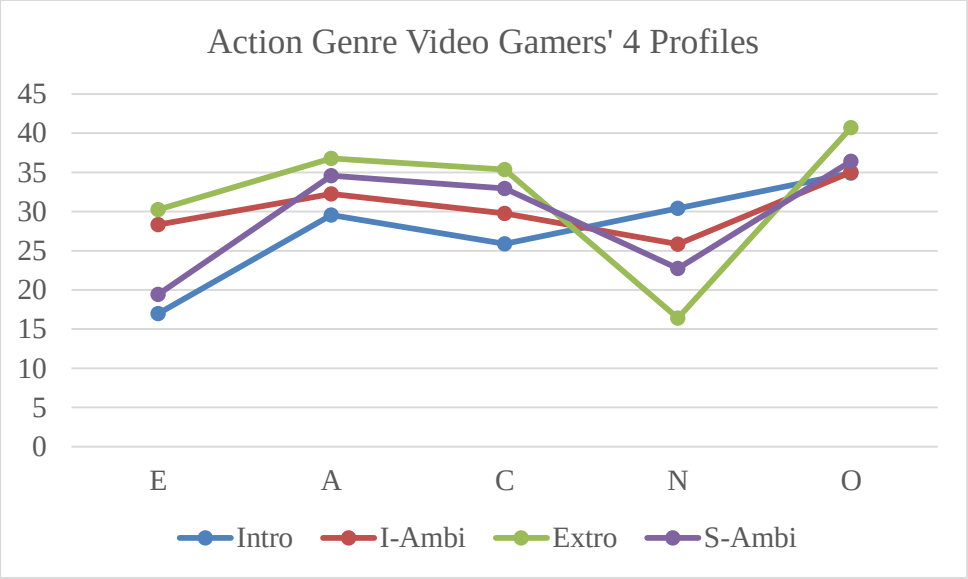

Figure 10. Action genre video gamers' identified profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

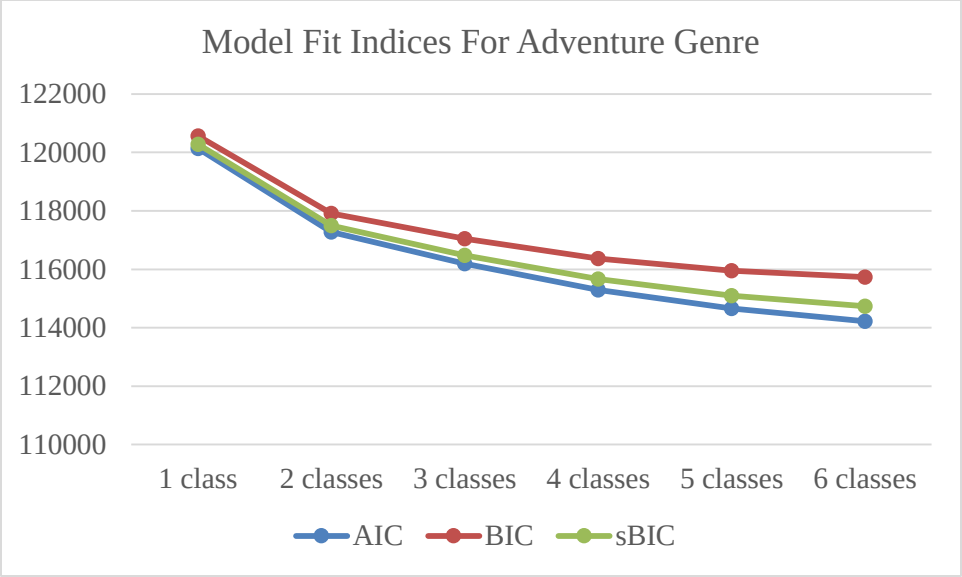

Figure 11. Model fit indices for the adventure genre. *Note:* AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information.

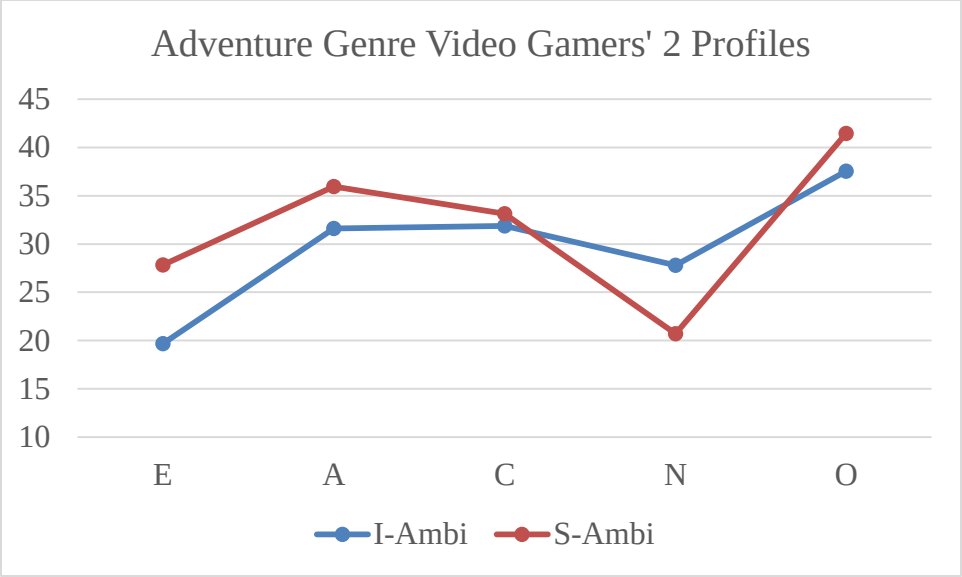

Figure 12. Adventure genre video gamers' identified profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

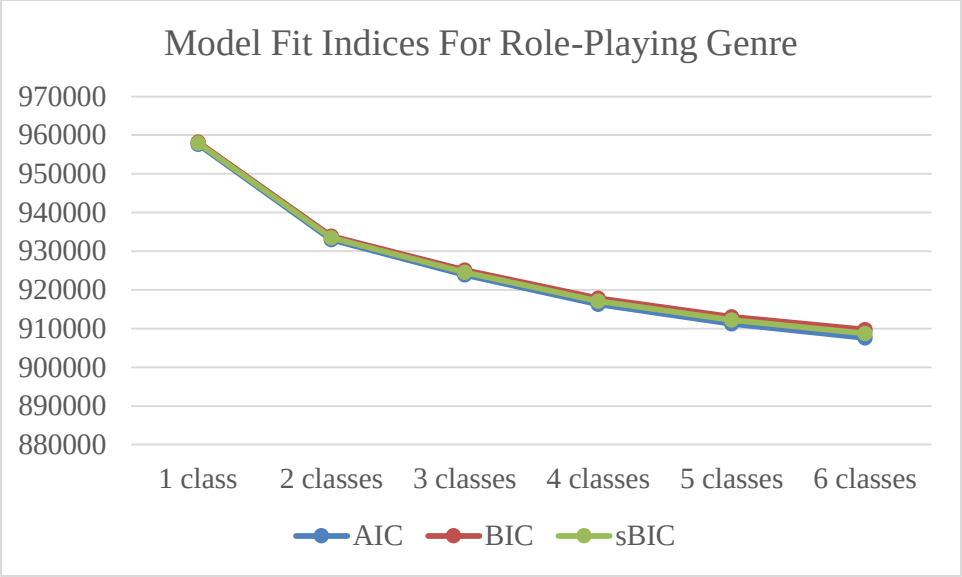

Figure 13. Model fit indices for the role-playing genre. *Note:* AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information.

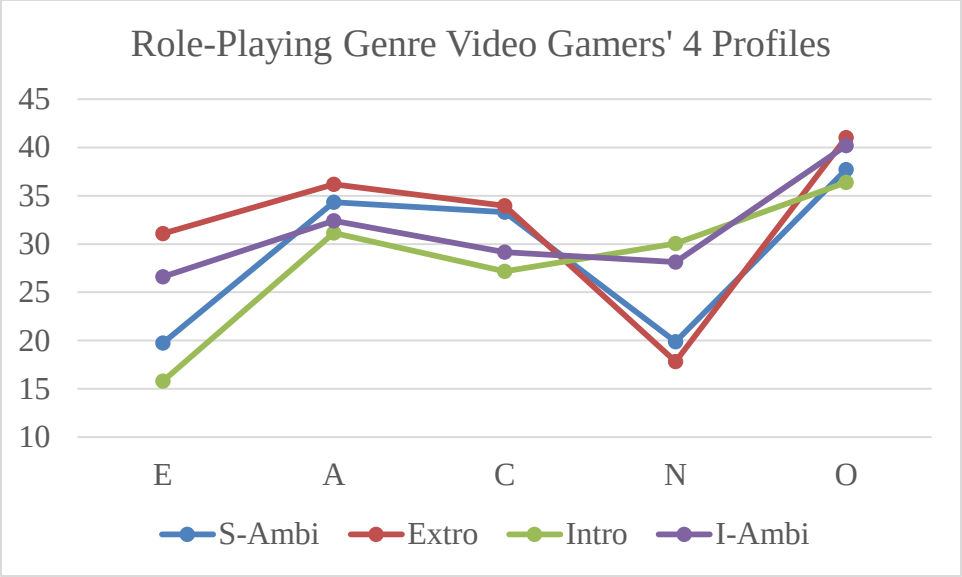

Figure 14. Role-playing genre video gamers' identified profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

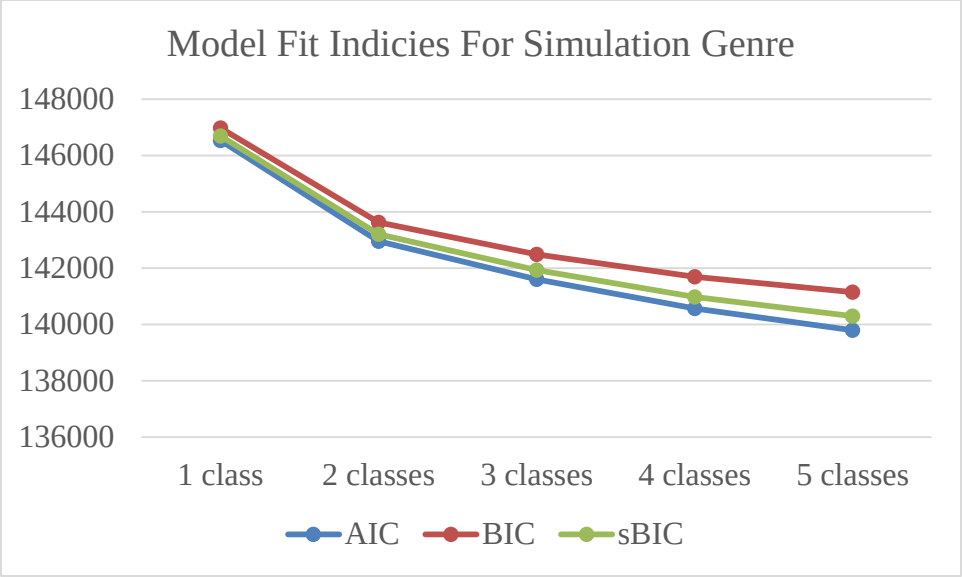

Figure 15. Model fit indices for simulation genre. *Note:* AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information.

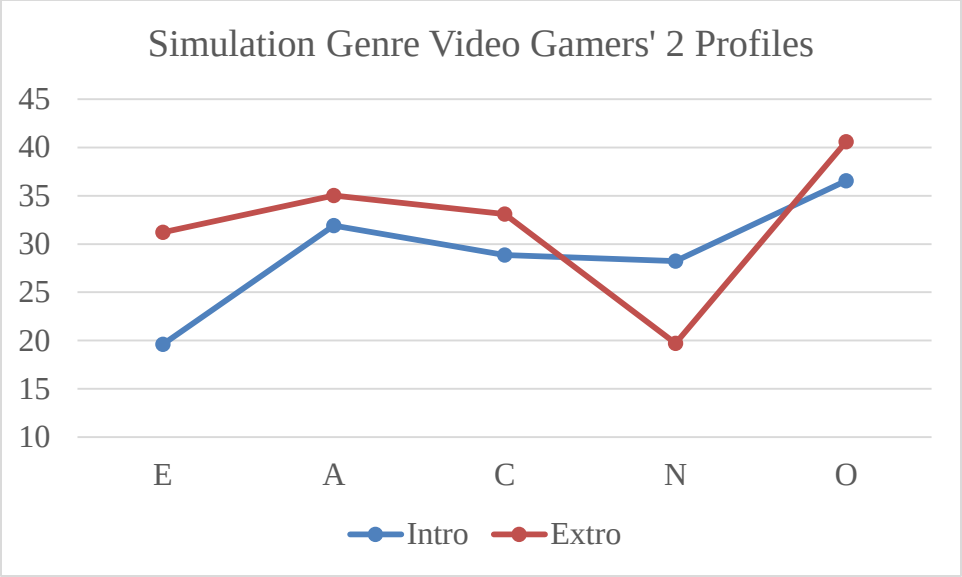

Figure 16. Simulation genre video gamers' identified profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

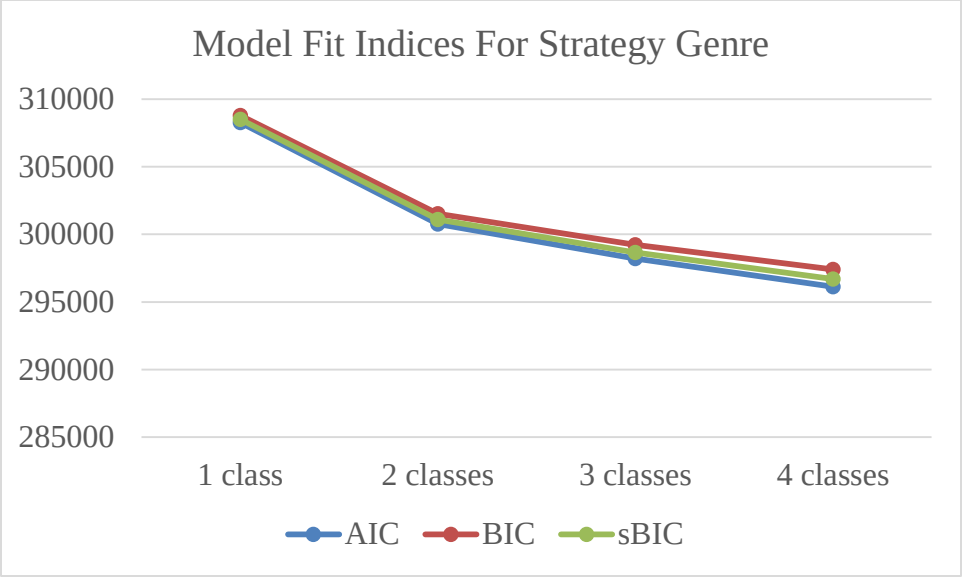

Figure 17. Model fit indices for the strategy genre. *Note:* AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information.

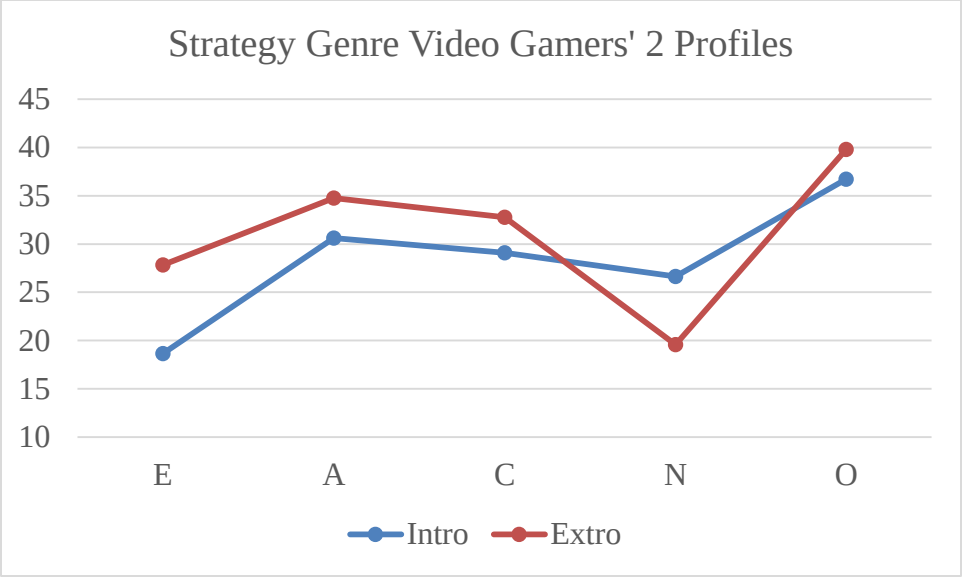

Figure 18. Strategy genre video gamers' identified profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

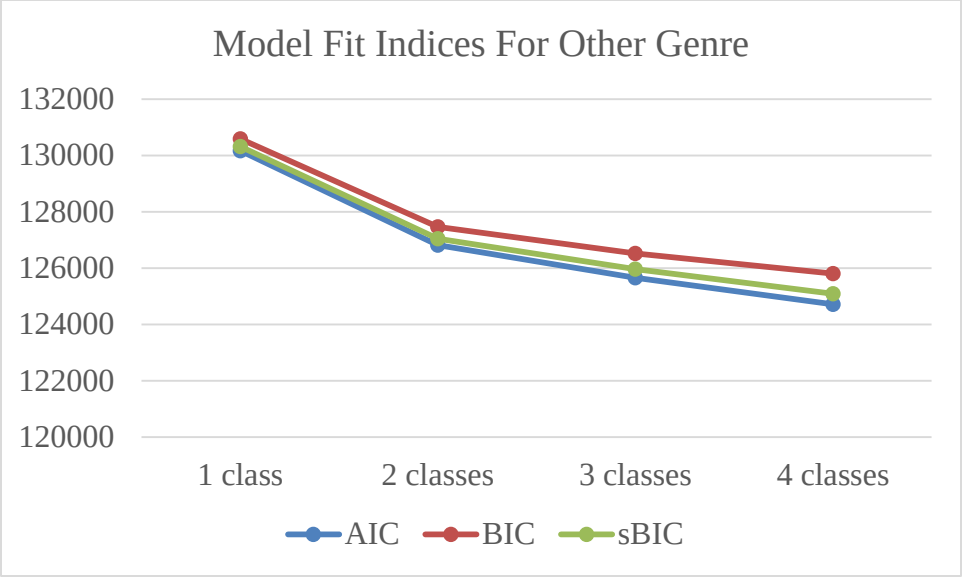

Figure 19. Model fit indices for the other genre. *Note:* AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion; sBIC = sample size adjusted Bayesian Information.

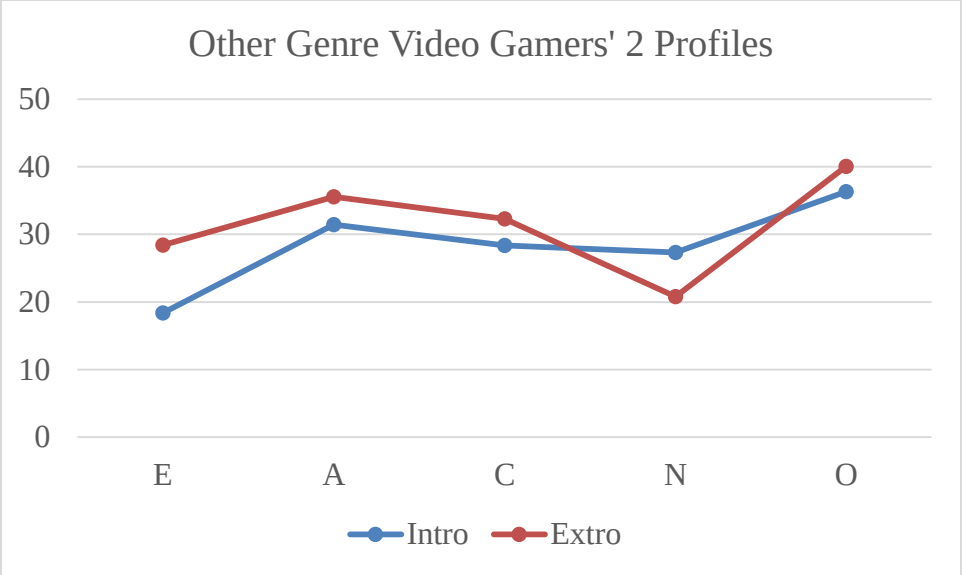

Figure 20. Other genre video gamers' identified profiles. *Note:* E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.