The Video Gamer Persona: A Five Factor Study Exploring Personality Elements of The Video Gamer

Anthony Bean[1,*] and Natasha Pooran[2]

[1]*Department of Psychology & Philosophy, Framingham State University, Framingham, MA*

[2]*Clinical Department, The Telos Project, Fort Worth, TX*

Absracts: This research 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 personality differences among the different preferred genres of video gamers. Different personality profiles were explored by employing t-tests and multivariate analysis of variance (MANOVA). Mapping of the BFI elements of video gamers across video game genres was conducted using latent profile analysis (LPA) to identify video gamer personality profiles, personality formations across preferred genres of play, examine the pattern of relationships among the variables, and to determine whether different personalities gravitate to specific genres of play. Results found four distinct and different personality profiles: Introversive, Extroversive, Secure Ambiversive, and Insecure Ambiversive; indicated no support for the different classification of video gamers possessing statistically different personality traits (*i.e.* causal, regular, hardcore); or different genres of video game play did have different personality types playing each genre. As such, evidence is provided for different personalities gravitating towards different genres of play and Carl Jung's (1921) idea of the introversion/extroversion continuum. Limitations observed were some findings becoming 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, generalizability of the study to the video gamer population, and this 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.

INTRODUCTION

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 31), there are multiple facts that are still unknown including motivations, personality traits, and effects on individuals of game play (ESA, 2021; Ferguson, 2013). Entertainment Software Association (2021) reported that casual games are the most online played video games (63%) followed by action, sports, strategy, and role-playing (39%), shooter games (39%), racing games (37%), family games (33%) and finally adventure games (31%). Additionally, 227 million Americans play video games, the average household in the United States has at least one gamer, and the gender ratio of video game players is slightly larger in the favor of males (55%) over females (45%; ESA, 2021).

*Address correspondence to this author at the Framingham State University, Framingham, MA;
E-mail: anthonymbeanphd@gmail.com

Research shows video games have positive effects on individuals serving a wide range of emotional needs along with intellectual stimulation (Granic, Lobel, & Engels, 2013; Kato, 2010; Redd *et al*., 1987; Turkle, 1994; Vasterling, Jenkins, Tope, & Burish, 1993). The use of video games has been shown to increase youth creativity and curiosity, help with patients' engagement and pain management in hospitals, increase clients' cooperation and enthusiasm in some mental health settings, and enhance students' grades, learning, reading, and ability to work with abstract ideas (Gee, 2007; Koster, 2005; Squire & Barab, 2004).

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.

E-ISSN: 2313-1047/22

PERSONALITY

Personality is comprised of thought patterns, emotions, social perspectives, and behaviors exhibited consistently over time which influence and nurture one's expectations, self-concept, motivations, values, and attitudes (McAdams, 2009; Phares & Chaplin, 1997). It is inherent in every living person, is a crucial element to understand the individual, and a foundational pillar of psychology due to the many elements, adaptations, and uniqueness found in individual persons (Carver & Scheier, 2004; Erikson, 1950, 1968). Within the overall personality of a person, there are clusters and dimensions that show and describe how a person will interact with the world around them. 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 and experiences from society (Carver & Scheier, 2004; McAdams, 2009).

Furthermore, research attempting to link personality types derived from a personality assessment tool (MBTI-M) and Star Wars: One Republic players' motivation to play online games yielded significant results (Kaufman, 2016). Kaufmann's assessment to measure specific motivation elements for playing online games (MPOGQ) showed significant differences in personality types across many gaming motivation categories. These findings suggest that personality may influence MMORPG players' game selection and supports the notion that personality is a central part of an individual that permeates through multiple aspects of life.

TYPOLOGY OF VIDEO GAMERS

Bartle (2003; 2004) identified four player categories from an investigation of online forums based on in-game play styles: *Achiever, Socializer, Explorer,* or *Killers*. However, Bartle's model has been criticized due to the exclusions of motivations of the gamer and their genre of focus. In an updated typology, Yee (2006) identified three player motivation categories from an online survey of Multiplayer Online Role Playing Game (MMORPG) players: *Achievement, Social, and Immersion*. *Achievement* concerns players' liking of the advancement, mechanics, or competition that video games offer. *Social* concerns an appreciation for the socializing, relationship-building, and teamwork in video games. Finally, *Immersion* concerns players' liking for the discovery, role-playing, customization, and escapism in video games (2006). Yee distinguishes that each player has a unique combination of motivations to play video games, meaning that the individual components found are not mutually exclusive.

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, 2001). 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 between the personality of the gamers and the virtual worlds played (Bean & Groth-Marnat, 2014; Ferro, Walz, & Greuter, 2013; Markey & Markey, 2010; Zammitto, 2001).

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 has increased; the different genres of video games evolved as well. A video game genre is by the set of 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*. 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 (2002) systematically conceptualized video game genres into 42 different categories, ranging from *abstract* and *adaptation* to *training simulation* and *utility*. In contrast, Apperley (2006) has conservatively represented video games into the following four main differentiating genres: *simulation, strategy, action,* and *role-playing*.

The most 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 while 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).

THE BIG FIVE INVENTORY & 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 *et al*., 2012; Yee, 2005; 2006; 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 also 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 different personalities preferred different styles of play. Furthermore, Graham and Gosling (2013) investigated WoW player's personality and motivations for playing the Massive Multiplayer Online Role Playing Game (MMORPG) and observed 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 is 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. While 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, 2006).

MATERIALS AND METHODS

This study utilized 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).

Data collection comprised one phase where participants were asked 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 one 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 additionally asked which genres they actually play in another question.

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 *et al*., 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 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 was utilized as it is a current classification. However, instead of eleven genres, there were seven in total. Four of the eleven were subsumed under other genres since, characteristically, they are 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 to which ones they currently play for comparison of the preferred genre.

PARTICIPANTS

Participants were solicited through online forums, participant referrals of friends, and through 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 that played video games was allowed to participate.

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, etc.; Fields, 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.

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. Since 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; while 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 research 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).

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%).

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%	
Associates	1802	9.3%	
Bachelors	4604	23.7%	
Masters	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

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**).

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 while males scored higher in extraversion (see Table **4**). The magnitude of the differences in the means was small for extraversion

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	.9%	40	1.5%
Caucasian	13040	77.9%	1999	75%
Hispanic	883	5.3%	108	4%
Native American/Alaska Native	103	.6%	18	.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%
Associates	1490	8.9%	312	5.2%
Bachelors	3794	22.7%	810	11.7%
Masters	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	.6%	48	1.8%
Casual Gamer	1433	8.6%	563	21.2%
Regular Gamer	8781	52.6%	1567	59%
Hardcore Gamer	6376	38.2%	477	18%
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	.3%	37	1.4%
Handheld	424	2.5%	265	10%
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)

(Cohen's d = .11), agreeableness (Cohen's d = .06), and openness (Cohen's d = .15), but large for neuroticism (Cohen's d = .66).

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

BFI = Big Five Inventory.

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 **5**). 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 **6**). Alpha was

Table 4: 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)			

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

Table 5: 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)			

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

Table 6: 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]
Associates	1790	23.76[1]	33.89[1,2]	31.96[1,2,4]	23.35[1]	39.10[1,2]
Bachelors	4553	23.92[1,3]	33.68[1,2]	32.09[1,2,3,4]	23.31[1]	39.22[1,2]
Masters	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]

[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.

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 **7**). When the results for the BFI domains were examined, all five scales reached statistical significance (see Table **8**). An inspection of the mean scores indicated video gamers who classified themselves as a casual gamer had statistically higher extraversion and conscientiousness scores compared to the gamers who classified themselves as a regular or hardcore gamer. 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 **7**). When the results for the BFI domains were examined all five scales reached statistical significance (see Table **9**). Evaluation of the mean scores indicated 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

Table 7: 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

VG = Video Game, * p < .001.

Table 8: 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)		

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

Table 9: 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)		

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

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 was 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 **7**). Examination of the mean scores indicated video gamers who played seven days a week had statistically lower extraversion scores than all of the video gamers who played 1-6 days a week, while those who played video games six days a week were statistically lower in extraversion than those who played three or four days a week. Video gamers who played seven days a week additionally had statistically lower agreeableness scores compared to those who play two-six days a week. Evaluation of the conscientiousness personality trait showed video gamers who played video games seven days a week, again, had lower conscientiousness score compared to video gamers who played one-six days a week. Additionally, video gamers who played six days a week also had statistically lower conscientiousness scores compared

to video gamers who played two-five days a week. As for the neuroticism personality trait, video gamers who played seven days a week scored statistically higher in neuroticism levels than those who only played for four or six days a week; the other days did not return statistically significant results in this area. Finally, video gamers who played video games seven days a week scored significantly lower in openness to experience compared to video gamers who played two-six days per week. Additionally, those who only played four days a week had statistically higher scores in openness than those who played six days a week (see Table **10**). 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

Table 10: 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)		
Openness	1	38.35	(6.12)	<.001*	1.00
	2	39.07[1]	(5.50)		
	3	39.24[1]	(5.50)		
	4	39.29[1,2]	(5.22)		
	5	38.88[1]	(5.40)		
	6	38.69[1,2]	(5.46)		
	7	38.04[1]	(5.72)		

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

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 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 **7**). 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 **11**). 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 **7**). 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, associates, and bachelors. 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 while video gamers who completed their bachelors 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, associates, bachelors, and masters. In addition, video gamers who only completed high school scored statistically lower compare to video gamers who completed associates or bachelors. 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, associates, bachelors, masters, and doctorate. However, video gamers who completed high school or their GED scored statistically lower compared to video gamers who completed technical college, associates, bachelors, masters, and doctorate. Additionally video gamers who completed technical college scored lower compared to video gamers who completed bachelors, masters, or doctorates. Finally, video gamers who completed their associates or bachelors 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/and their GED scored significantly higher compared to video gamers who completed their associates, bachelors, masters, 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 educationally attained associates, bachelors, or doctorates scored statistically higher compared to video gamers who did not complete any education, completed high school, technical college. However, video gamers who completed their associates or bachelors scored lower compared to video gamers who completed their masters. In addition, video gamers who completed their masters scored statistically higher compared to video gamers who did not complete any

Table 11: 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)		

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, * $p < .001$.

education, completed high school, their GED, and technical college (see Table **12**). 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 *et al*. (2007) suggested that the criterion BIC to be a best determination of identifying the best fit model with lower scores being representable of identifying appropriate numbers of classes from the data. Additionally, it is recommended

Table 12: 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)		

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

to use the LMRT variable in conjunction with the BIC as the BLRT has been suggested to be affected by nonsymmetrical data distributions and thus can provide inaccurate interpretation (Nylund *et al*., 2007). An additional probability characteristic of importance is the principle of parsimony. According to Collins and Lanza (2013), this is when two or more models have the ability to represent the data similarly well, the model which is simplest, but statistically rigorously, should be selected as the best fit model.

Evaluation of the LPA for the overall sample, solutions with multiple profiles were considered to fit

the data better than a unitary solution (see Table **13**). The LMRT indicated 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). While the BIC did not completely plateau at eight latent profiles, its decrease significantly declined compared to earlier profile results (see graph 1). Coupled with the non-significant LMRT at seven and eight classes, it appeared 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 graphs 2, 3, 4), and two profiles was determined to be too simple (see graph 5). Four profiles appeared to be the best solution due to the differences observed between the profile personality traits (see graph 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 based upon the theoretical basis of being extroverted and 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 which 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 **14**).

For the solution with four latent profiles, the average probabilities for the most likely class membership were

Table 13: 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

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 14: 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)

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

.930 for the Introversive profile, .901 for Secure Ambiversive profile, .929 for the Extroversive profile, and .911 for Ambiversive profile (see Table **15**) with an entropy values of .854 (see Table **13**) 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 **16**). 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 graph 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 two and three. Solution three was chosen as a result of appropriate matching to the overall sample four profile solution and solution two 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 graph 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 **17**). For

Table 15: Mean Probabilities of Latent Class Membership: Entire Sample, N = 19,164

			Latent Profile			
Latent Profile	***N***	**%**	**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

N = Number of Participants; % = Percentage of Participants In Class.

Table 16: 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

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

			Latent Profile		
Latent Profile	***N***	**%**	**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

N = Number of Participants; % = Percentage of Participants In Class.

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 **17**), with an entropy value of .847 (see Table **16**) 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 **18**). 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 **19**). The LMRT indicated the fit did not reach statistical significance when increasing the number of latent classes to five from four (p = .34), while the decrease in BIC plateaued at six latent classes (see graph 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 two, three, and four. Solution four was chosen as a result of appropriate matching to the overall sample four profile solutions, solutions two and three 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 graph 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 **19**). For the solution with four latent profiles, the average

Table 18: 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

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

			Latent Profile			
Latent Profile	***N***	**%**	**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

N = Number of Participants; % = Percentage of Participants In Class.

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 **19**) with an entropy value of .861 (see Table **18**) 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 **20**). 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 **21**). The LMRT indicated 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 graph 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

Table 20: 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)

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

Table 21: 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

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.

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 Ambversive profile (profile 1) and the Secure Ambiversive profile (profile 2; see graph 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 **22**). 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 **22**), with an entropy value of .851 (see Table **21**) 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 **23**). 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 were considered to fit the data better than a unitary solution (see Table **24**). The LMRT indicated 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 more latent profiles would be non-significant (see graph 13). Evaluating the model fit criterion for the action genre, three different solutions were possibilities, solutions two, three, and four. Solution four was chosen as a result of appropriate

Table 22: Mean Probabilities of Latent Class Membership: Adventure Genre Sample, N = 917

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

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

Table 23: 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)

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

Table 24: 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

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.

matching to the overall sample four profile solutions, solutions two and three 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 (profile 2); the Extroversive profile (profile 3); and the the Secure Ambiversive profile (profile 4, see graph 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 **25**) with an entropy value of .861 (see Table **24**) 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 **26**). 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).

Table 25: Mean Probabilities of Latent Class Membership: Roleplaying Sample, N = 5,387

			Latent Profile			
Latent Profile	***N***	**%**	**Introversive**	**Insecure Ambiversive**	**Extroversive**	**Secure Ambiverisve**
Introversive	1,895	26.1	.933	.027	.000	.045
Insecure Ambiversive	2,050	28.2	.014	.920	.036	.035
Extroversive	1,410	19.3	.000	.040	.926	.026
Secure Ambiversive	1,927	26.4	.029	.039	.021	.906

N = Number of Participants; % = Percentage of Participants In Class.

Table 26: 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)

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

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 **27**). The LMRT indicated 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 graph 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 graph 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 **28**), with an entropy value of .844 (see Table **27**) 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 **29**). 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

Table 27: 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

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 28: 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

N = Number of Participants; % = Percentage of Participants In Class.

Table 29: 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)

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

profiles fitting the data better than a unitary solution (see Table **30**). The LMRT indicated 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 graph 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 graph 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 **31**) with an Entropy value of .855 (see Table **30**) 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 **32**). 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 **33**). The LMRT indicated the fit did not reach statistical significance when increasing the number of latent profiles to three from two (p = .63), while the decrease in BIC plateaued at four latent profiles (see graph 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

Table 30: 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

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 31: 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

N = Number of Participants; % = Percentage of Participants In Class.

Table 32: 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)

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

Table 33: 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

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.

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 graph 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 **34**), with an entropy value of .870 (see Table **33**) 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 **35**). 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 amount of participants advocated a statistical difference, but examining the overall score differences provided greater insight to how small the differences were. Within the t-test's 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) while 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 the population size heavily influenced the statistical analysis with the large sample

Table 34: 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

N = Number of Participants; % = Percentage of Participants In Class.

Table 35: 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)

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

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.

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 highly suggesting an extremely robust sample. The total number of participants influenced the statistical results in the t-tests and MANOVAs providing significant results, but low effect sizes with regards 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 criterion were utilized to determine the relative importance for the t-tests and MANOVAs ignoring findings that were statistically significant but still did not have large effect sizes.

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 female gamers possibly 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. Several well-known female video gamers were subjected to a campaign of misogynistic attacks because of their beliefs and feministic views of the male-dominated culture of video games beginning in August of 2014 continuing still today. 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 each with significant findings statistically emerging from each MANOVA. 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, as a video gamer, there are small and possibly negligible differences among video gamer’s ethnicity and their personalities constituting a gamer personality score stable across different ethnicities. Additionally, regardless of how a video gamer designated themselves (*i.e*. causal, regular, hardcore) there were no significant differences between the self-classification of video gamer’s personalities. Furthermore, regardless

of the amount of days played per week, personality scores did not differ based upon the amount of time played. This likely suggests a video gamer's personality may be more important in determining their behavior (*i.e*. exhibiting aggression and violence) and that their personalities are 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 if age played a determining factor in this finding. While this may not be as an important finding for the video gamer population, it does seem to suggest 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 personality is a factor in understanding the video gamer on a larger and more comprehensive level. While 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 while 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 (1921). This is typically viewed as a single continuum of human personality. For example, being high in one element such as extroversion means 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 while 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, while in contrast the extroversive is revitalized (Eysenck, 1971; Jung, 1921). 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, 1921; Ryckman, 2004). Ambiversive personalities have traits and attributes of both Extroversive and Introversive

personalities dependent upon their needs at the time (Cohen & Schmidt, 1979). Although it is important to note 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, the individual is 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, 1921).

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 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 and/or 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 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 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 non-confrontational 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 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 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 these personality types dominate these 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. While 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 and T-tests requiring careful scrutiny of the mean scores. As such, it was imperative to increase the range of statistical significance requirement and examine the differences of the mean scores across the MANOVAs and T-tests. Furthermore, this is an example of statistics reaching significance, but have insignificant findings.

The above limitations show an increased need to examine personalities of gamers to discover the role of personality in influencing choices of playing video games. The authors 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, if the possibility of playing certain avatar roles influences the development of personality, or a mixture of both. Finally, since 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 further important to list the strengths of this research as well. For instance, while 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. With this large sample, it enables solid generalizations to the population of video gamers further increasing the significance of its findings. By the large number of participants and the ability to generalize to the video gamer population, it is additionally impressive that this research 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 game should be researched to understand if the personality profiles are consistent across the different genres of video games.

In summation, this research is one of the largest, if not the largest, sample of video gamer's personality traits. It provided significant differences between men and women primarily on the BFI trait of neuroticism and little to no differences among other 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 certain personality patterns prefer specific genres of play further suggesting different individuals may gravitate towards different preferences of play. In conclusion, this research provides the basis of the personality typology of the video gamer.

REFERENCES

[1] Anderson CA, & Bushman, BJ. (2001). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytic review of the scientific literature. Psychological Science, 12(5), 353-359. https://doi.org/10.1111/1467-9280.00366

[2] Anderson CA, & Dill KE. (2000). Video games and aggressive thoughts, feelings, and behavior in the laboratory and in life. Journal of Personality and Social Psychology, 78(4), 772-790. https://doi.org/10.1037/0022-3514.78.4.772

[3] Apperley TH. (2006). Genre and game studies: Towards a critical approach to video game genres. Simulation & Gaming, 37(1), 6-23. https://doi.org/10.1177/1046878105282278

[4] Arriaga P, Esteves F, Carneiro P, & Monteiro MB. (2006). Violent computer games and their effects on state hostility and physiological arousal. Aggressive Behavior, 32(4), 358-371. https://doi.org/10.1002/ab.20134

[5] Atkinson RL, Atkinson RC, Smith EE, Bem DJ, & Nolen-Hoeksema S. (2000). Hilgard's Introduction to Psychology (13 ed.). Orlando, Florida: Harcourt College Publishers.

[6] Bartle RA. (2003). Hearts, clubs, diamonds, spades: players who suit MUDs. The Game Design Reader: A Rules of Play Anthology, 754-787.

[7] Bartle RA. (2004). Designing virtual worlds. Berkeley, CA: New Riders.

[8] Bean A, & Groth-Marnat G. (2014, March 10). Video gamers and personality: A five-factor model to understand game playing style. Psychology of Popular Media Culture. Advance online publication.

[9] Benet-Martinez V, & John OP. (1998). Los cinco grandes across cultures and ethnic groups: Multitrait multimethod analyses of the big five in Spanish and English. Journal of Personality and Social Psychology, 75, 729-750. https://doi.org/10.1037/0022-3514.75.3.729

[10] Carver C, & Scheier M. (2004). Perspectives on Personality (5th ed.). Boston, MA: Pearson. https://doi.org/10.1002/0471264385.wei0508

[11] Cohen D, & Schmidt JP. (1979). Ambiversion: Characteristics of Midrange Responders on the Introversion-Extraversion

Continuum. Journal of Personality Assessment, 43(5), 514-6. https://doi.org/10.1207/s15327752jpa4305_14

[12] Collins LM, & Lanza ST. (2013). Latent class and latent transition analysis: With applications in the social, behavioral, and health sciences. Hoboken, N.J: Wiley.

[13] Crawford C. (1997). The art of computer game design. Retrieved from http://book.huihoo.com/the-art-of-computer-game-design/Coverpage.html.

[14] Dewey C. (2015). This is what happened when you create and online community without any rules. Retrieved from http://www.washingtonpost.com/news/the-intersect/wp/2015/01/13/this-is-what-happens-when-you-create-an-online-community-without-any-rules/.

[15] Dill KE, & Dill JC. (1998). Video game violence: A review of the empirical literature. Aggression and Violent Behavior, 3(4), 407-428. https://doi.org/10.1016/S1359-1789(97)00001-3

[16] Entertainment Software Association (ESA). (2021). Essential facts about the computer and video game industry. Retrieved from: http://www.theesa.com/.

[17] Erikson EH. (1950). Childhood and society. New York: Norton.

[18] Erikson EH. (1968). Identity: youth and crisis. New York: Norton.

[19] Eysenck HJ. (1971). Readings in Extraversion-Introversion. New York: Wiley.

[20] Ferguson CJ. (2013). Violent video games and the Supreme Court: Lesson for the scientific community in the wake of the Brown v. Entertainment Merchants Association. American Psychologist, 68, 57-74. https://doi.org/10.1037/a0030597

[21] Ferro LS, Walz SP, & Greuter S. (2013). Towards personalised, gamified systems: An investigation into game design, personality and player typologies. In Proceedings of The 9th Australasian Conference on Interactive Entertainment: Matters of Life and Death (pp. 7:1-7:6). New York, NY, USA: ACM. https://doi.org/10.1145/2513002.2513024

[22] Field A. (2009). Discovering statistics using SPSS (3rd ed.). Thousand Oaks, CA: Sage Publications.

[23] Funk JB, Buchman DD, Jenks J, & Bechtoldt H. (2003). Playing violent video games, desensitization, and moral evaluation in children. Journal of Applied Developmental Psychology, 24(4), 413-436. https://doi.org/10.1016/S0193-3973(03)00073-X

[24] Gee JP. (2007). Good video games plus good learning. New York, NY: Peter Lang. https://doi.org/10.3726/978-1-4539-1162-4

[25] Geiser C. (2013). Data analysis with MPlus. New York, NY: Guilford Press.

[26] Goldberg LR. (1992). The development of markers for the Big-Five factor structure. Psychological Assessment 4: 26-42. https://doi.org/10.1037/1040-3590.4.1.26

[27] Goode L. (2013, January, 11). Oculus rift virtual-reality headset puts you right in the game. All Things Digital. Retrieved from http://allthingsd.com/20130111/oculus-rift-virtual-reality-headset-puts-you-right-in-the-game/.

[28] Graham LT, & Gosling SD. (2013). Personality profiles associated with different motivations for playing world of warcraft. Cyberpsychology, Behavior, and Social Networking, 16(3). 189-193. https://doi.org/10.1089/cyber.2012.0090

[29] Granic I, Lobel A, & Engels RCME. (2013). The benefits of playing video games. American Psychologist, 1-13. https://doi.org/10.1037/a0034857

[30] Gravetter FJ, & Wallnau LB. (2008). Essentials of statistics for the behavioral sciences (7th ed.). Belmont, CA: Cenage Learning.

[31] Grimm LG. & Yarnold PR. (2003). Reading and understanding multivariate statistics. Washington, DC: American Psychological Association.

[32] Grucza RA, Goldberg LR. (2007). The comparative validity of 11 modern personality inventories: Predictions of behavioral acts, informant reports, and clinical indicators. Journal of Personality Assessment 89(2): 167-187. https://doi.org/10.1080/00223890701468568

[33] Hilgard J, Engelhardt CR, & Bartholow BD. (2013). Individual differences in motives, preferences, and pathology in videogames: The gaming attitudes, motives, and experiences scales (GAMES). Frontiers In Psychology, 4, 1-13. https://doi.org/10.3389/fpsyg.2013.00608

[34] Huesmann LR. (2007). The impact of electronic media violence: Scientific theory and research. Journal of Adolescent Health, 41(6), S6-S13. https://doi.org/10.1016/j.jadohealth.2007.09.005

[35] Jeng SP, & Teng CI. (2008). Personality and motivations for playing online games. Social Behavior and Personality: An International Journal, 36(8), 1053-1060. https://doi.org/10.2224/sbp.2008.36.8.1053

[36] John OP, Naumann LP, & Soto CJ. (2008). Paradigm shift to the integrative big-five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), Handbook of personality: Theory and research (pp. 114-158). New York, NY: Guilford Press.

[37] John OP, Donahue EM, & Kentle RL. (1991). The Big Five Inventory-Versions 4a and 54. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research. https://doi.org/10.1037/t07550-000

[38] Jung CG. (1921). Psychological types. The collected works of C. G. Jung, Vol. 6, Bollingen Series XX.

[39] Kato PM. (2010). Video games in health care: Closing the gap. Review of General Psychology, 14(2), 113-21. https://doi.org/10.1037/a0019441

[40] Kaufmann DA. (2016). Personality, Motivation, & Online Gaming (Doctoral Dissertation). Retrieved from Proquest. (10246131).

[41] Koster R. (2005). A theory of fun for game design. Scottsdale, AZ: Paraglyph Press.

[42] Markey PM, & Markey CN. (2010). Vulnerability to violent video games: A review and integration of personality research. Review of General Psychology, 14(2), 82-91. https://doi.org/10.1037/a0019000

[43] McAdams DP. (2009). The person: A new introduction to personality psychology (5th ed.). Hoboken, NJ: Wiley.

[44] McAllister S. (2013). Video game genres. Ebook: OxBo Publishing.

[45] McCrae RR. & Costa PT. (1991). Adding liebe und arbeit: The full five-factor model and well-being. Personality and Social Psychology Bulletin, 17(2): 227-32. https://doi.org/10.1177/014616729101700217

[46] Muthen LK, & Muthen BO (2012). Mplus: Statistical analysis with latent variable: User's guide. Los Angeles, CA: Muthén & Muthén.

[47] Nylund KL, Asparouhov T, & Muthén BO. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. Structural Equation Modeling, 14, 535-569. https://doi.org/10.1080/10705510701575396

[48] Phares EJ, Chaplin WF. (1997). Introduction to personality (4th ed.). New York, NY: Longman.

[49] Przybylski AK, Ryan RM, & Rigby CS. (2009). The motivating role of violence in video games. Personality and Social Psychology Bulletin, 32(2), 243-59. https://doi.org/10.1177/0146167208327216

[50] Romano A. (2014). The battle of gamergate and the future of video games. Retrieved from http://kernelmag.dailydot.com/issue-sections/features-issue-sections/11195/battle-of-gamergate-2014/.

[51] Rammstedt B. & John OP. (2007), Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. Journal of Research in Personality, 41, 203-212. https://doi.org/10.1016/j.jrp.2006.02.001

[52] Redd WH, Jacobsen PB, Die Trill M, Dermatis H, McEvoy M, & Holland JC. (1987). Cognitive-attentional distraction in the control of conditioned nausea in pediatric cancer patients receiving chemotherapy. Journal of Consulting and Clinical Psychology, 55, 391-395. https://doi.org/10.1037/0022-006X.55.3.391

[53] Ryckman R. (2004). Theories of Personality. Belmont, CA: Thomson/Wadsworth.

[54] Sheff D. (1993). Game Over. New York, NY: Random House.

[55] Shen J, Brdiczka O, Ducheneaut N, Yee N. and Begole B. (2012). Inferring personality of online gamers by fusing multiple-view predictions. Lecture Notes in Computer Science, 7379/2012, pp. 261-273. https://doi.org/10.1007/978-3-642-31454-4_22

[56] Squire K, & Barab SA. (2004). Replaying history: Learning world history through playing Civilization III. Indiana University Bloomington. Retrieved from http://website.education.wisc.edu/kdsquire/REPLAYING%20HISTORY.doc

[57] Stuart K. (2014). Zoe Quinn: 'All gamergate has done is ruin people's lives'. Retrieved from http://www.theguardian.com/technology/2014/dec/03/zoe-quinn-gamergate-interview.

[58] Tabachnick BG, & Fidell LS. (2013). Using Multivariate Statistics (6th ed.). Boston, MA: Pearson.

[59] Turkle S. (1994). Constructions and reconstructions of self in virtual reality: Playing in the MUDs. Mind, Culture, and Activity, 1(3), 158-67. https://doi.org/10.1080/10749039409524667

[60] Vasterling J, Jenkins RA, Tope DM, & Burish TG. (1993). Cognitive distraction and relaxation training for the control of side effects due to cancer chemotherapy. Journal of Behavioral Medicine, 16, 65-79. https://doi.org/10.1007/BF00844755

[61] Wolf MJP. (2002). The medium of the video game. Austin, TX: University of Texas Press. https://doi.org/10.7560/791480

[62] Yee N. (2005). Motivations of play in MMORPGs. Retrieved from http://summit.sfu.ca/item/212.

[63] Yee N. (2006). Motivations of play in online games. Journal of CyberPsychology and Behavior, 9, 772-775. https://doi.org/10.1089/cpb.2006.9.772

[64] Yee N, Ducheneaut N, Nelson L, & Likarish P. (2011). Introverted elves and conscientious gnomes. The expression of personality in world of warcraft. Proceedings of CHI 2011, 753-762. https://doi.org/10.1145/1978942.1979052

[65] Yee N, Harris H, Jabon M, & Bailenson JN. (2011). The expression of personality in virtual worlds. Social Psychology and Personality Science, 2, 5-12. https://doi.org/10.1177/1948550610379056

[66] Zachary J. (2015). Game of fear. Retrieved from http://www.bostonmagazine.com/news/article/2015/04/28/gamergate/.

[67] Zammitto VL. (2001). Gamers' personality and their gaming preferences. Communication, Art & Technology: School of Interactive Arts and Technology. Retrieved from http://summit.sfu.ca/item/11349.

Received on 21-06-2022 Accepted on 17-07-2022 Published on 05-08-2022

DOI: https://doi.org/10.12974/2313-1047.2022.09.7