

DEVELOPING A MODEL OF VIDEO GAME PLAY:
MOTIVATIONS, SATISFACTIONS, AND CONTINUANCE INTENTIONS

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DEDICATION

To my parents and my wife, you always believed in me and supported me

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ABSTRACT

As video game usage continues to rise, it is important to understand why people choose and continue playing a game. This research presents a theoretical framework to explore the relationships between gameplay motivations, satisfaction, continuance intention and gameplay. All constructs were from previously validated measures. Motivations were measured by the Trojan Player Typology, which assessed story-driven, completionist, competitor, escapist, smarty-pants, and socializer motives. Satisfaction was measured using the Game User Experience Satisfaction Scale (GUESS), which assessed satisfaction with usability/playability, narratives, play engrossment, enjoyment, creative freedom, audio aesthetic, personal gratification, social connectivity, and visual aesthetics. Continuance intention was measured using a 4-item scale.

To examine these relationships, survey data was collected from 353 participants who played different types of online games, including *League of Legends*, *World of Warcraft*, *Overwatch*, and *Hearthstone*, for at least 10 hours in the past three months. A series of structural equation models were tested to identify the model with the best validity and fit. The final model suggested that motivations were positively related to satisfaction, while satisfaction was positively related to continuance intention and weekly play time. Motivations accounted for 20% of the variance in satisfaction, and the story-driven motivation was the strongest predictor. Further, satisfaction accounted for 47% of the variance in continuance intention and 8% of the variance in weekly play time. Thus, it seems that individual differences in gameplay motivation are an important component of a player's satisfaction. Further, satisfaction appears to be central to a player's intention to continue using a game.

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CHAPTER 1

INTRODUCTION

Video Game Usage

In 2015, \$23.5 billion dollars were spent on the video game industry in the United States (Entertainment Software Association; ESA, 2016). The Entertainment Software Association (2016) conducted a large sample survey and identified many characteristics of video game players. Video games are played for at least 3 hours per week in approximately three out of every five households in the United States (63%; ESA, 2016). The average age of a video game player is 35 years old and player ages are relatively uniform in distribution across age groups (ESA, 2016). Twenty-seven percent of the video game players are under the age of 18, 29% are between 18 and 35, 18% are between 36 and 49, and 26% are at least 50 years old (ESA, 2016). Video game players typically play games on a personal computer (PC; 56%), game console (e.g., Sony PlayStation, Microsoft Xbox, Nintendo Wii; 53%), smartphone (36%), wireless device (31%), or handheld game system (e.g., Nintendo 3DS; 17%; ESA, 2016). Further, video games are played by both males (59%) and females (41%; ESA, 2016). As video game usage continues to rise, it is important to understand why people choose and continue playing a game. To understand these questions, it is essential to study player motivations, game play satisfaction, play time, and intentions to continue playing a game.

Video Game Satisfaction

Video game satisfaction has been defined as “the degree to which the player feels gratified with his or her experience while playing a video game” (Albert & Tullis, 2013; Phan, Keebler, & Chaparro, 2016). There have been many published measures of game satisfaction

(Phan et al., 2016). However, many measurement tools for game satisfaction do not provide a comprehensive understanding of a player's gratifications.

In their review of the game satisfaction measurement tools, Phan and colleagues (2016) identified several limitations. First, many of the existing scales of game satisfaction only measure one attribute of satisfaction (Phan et al., 2016). Second, the studies on existing measures have focused on specific game types (Phan et al., 2016). Third, measurement scales have not considered other important aspects of game satisfaction, such as usability and social interaction (Phan et al., 2016). Fourth, many of the measurement tools have been developed to support research and do not address the task of evaluating games (Phan et al., 2016). Fifth, many items within scales are unclear (Phan et al., 2016). Sixth, game satisfaction scales were not developed and validated using rigorous practices, such as using a literature review, expert review, pilot sample, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to develop and validate the scale (Phan et al., 2016).

To address the limitations of prior satisfaction assessment tools, Phan, Keebler, and Chaparro (2016) developed satisfaction scale using rigorous development (i.e., literature review, expert review, pilot sample, EFA) and validation methods (i.e., CFA). The Game User Experience Satisfaction Scale (GUESS) is a 55-item validated scale of video game satisfaction with 9 subscales (Phan et al., 2016). The subscales of the GUESS include Usability/Playability, Narratives, Play Engrossment, Enjoyment, Creative Freedom, Audio Aesthetics, Personal Gratification, Social Connectivity, and Visual Aesthetics. Table 1 describes each subscale of the GUESS.

Table 1

Phan, Keebler, and Chaparro's (2016) Descriptions of GUESS Subscales

Subscale	Description
Usability/Playability	The ease in which the game can be played with clear goals/objectives in mind and with minimal cognitive interferences or obstructions from the user interfaces and controls
Narratives	The story aspects of the game (e.g., events and characters) and their abilities to capture the player's interest and shape the player's emotions
Play Engrossment	The degree to which the game can hold the player's attention and interest
Enjoyment	The amount of pleasure and delight that was perceived by the player as a result of playing the game
Creative Freedom	The extent to which the game is able to foster the player's creativity and curiosity and allows the player to freely express his or her individuality while playing the game
Audio Aesthetics	The different auditory aspects of the game (e.g., sound effects) and how much they enrich the gaming experience
Personal Gratification	The motivational aspects of the game (e.g., challenge) that promote the player's sense of accomplishment and the desire to succeed and continue playing the game
Social Connectivity	The degree to which the game facilitates social connection between players through its tools and features
Visual Aesthetics	The graphics of the game and how attractive they appeared to the player

Previous research has associated game play motivations and continuance intentions (i.e., a player's intention to continue playing a game in the future) with game satisfaction. Choi and Kim (2004) suggest that players are more likely to continue to play a game if they have an optimal experience during game play (Choi & Kim, 2004). Choi and Kim (2004) define optimal experience as a player feeling focused, curious, interested, and in control of their play experience. These experiences have been referred to as flow (Csikszentmihalyi & Csikszentmihalyi, 1992).

Further, optimal game play experience has been predicted by both effective social and personal interactions in a game (Choi & Kim, 2004).

While satisfaction has been linked to continuance intentions and game play motivations, there has been little consensus in the use of game satisfaction scales and few studies used a measure of satisfaction that was validated in a gaming context. Li and colleagues (2015) argued that inconsistencies in the satisfaction literature may indicate that satisfaction theory used in previous research may not be sufficient to describe why people cease playing one game to switch to another (Li, Liu, Xu, Heikkilä, & Van Der Heijden, 2015). A meta-analysis performed to identify why people play video games found that satisfaction affects intentions to play a game (Hamari & Keronen, 2017). However, few published studies were included in the meta-analysis, suggesting that further research is needed to explore the effects of satisfaction (Hamari & Keronen, 2017). One study that evaluated the influences of customer involvement (e.g., “online gaming is important for me”) with online games found a weak relationship between satisfaction and reuse behavior when involvement was high, but a stronger positive relationship existed when involvement was low (Tseng & Wang, 2013). Reuse behavior was operationally defined as the frequency of play and the duration of play (Tseng & Wang, 2013).

Another limitation of the meta-analysis is that the majority of the findings were derived from models that employed the Technology Acceptance Model (TAM), which is a theory of how people accept and use technology (TAM; Davis, 1986; Hamari & Keronen, 2017). The TAM models the relationships between perceived usefulness, perceived ease of use, attitude toward use, behavioral intention to use, and actual use (Davis, 1986). Although a theoretical grounding using the TAM is a useful tool for framing the reasons people use media, it limits the scope of the independent variables studied (Hamari & Keronen, 2017). Consequently, Hamari and

Keronen (2017) call for research that explores alternative factors influencing motivation and continuance intentions, while remaining comparable to previous research. This research aligns with this need by exploring a unique set of independent variables (i.e., player motivations) and remains comparable to previous research by predicting intentions to continue playing a game with player experience satisfaction.

Theory of Game Play Motivations

Self-Determination Theory

Self-determination theory (SDT) is a theoretical framework that includes a set of theories of motivation (Ryan & Deci, 2000). Overall, SDT aims to understand how intrinsic and extrinsic motivations relate to human growth and well-being (Ryan & Deci, 2000). Intrinsic motivation is the impetus to perform actions that are inherently satisfying to perform (Ryan & Deci, 2000). Extrinsic motivation is the drive to perform actions to obtain a reward beyond completing the action itself (e.g., money, grades, achievements; Ryan & Deci, 2000). Two of the theories in SDT that have been discussed in relation to video game play motivation include the Cognitive Evaluation Theory and the Psychological Need Theory.

The Cognitive Evaluation Theory is one theory within SDT that posits that actions that afford for autonomy and competence will support intrinsic motivation (Ryan, Rigby, & Przybylski, 2006). Conversely, actions that lack autonomy and competence may constrain intrinsic motivation (Ryan et al., 2006). Autonomy is the experience of feeling in control of the decisions made during a task and competence is the experience of feeling effective while performing a task of optimal difficulty (Ryan & Deci, 2000). Game environments that constrain a player's control over decision making should hinder the experience of autonomy (Bostan & Catak, 2016). Challenges in a game that are too difficult or too easy hamper the experience of

competence (Bostan & Catak, 2016). Conversely, a player who experiences high levels of autonomy and competence in a video game should be intrinsically motivated to continue playing the game and should have a positive experience.

Another facet of SDT is Psychological Need Theory, which speculates that human well-being and psychological growth is related to the extent to which psychological needs are satisfied during a task (Ryan & Deci, 2000). Further, the three basic psychological needs that all humans have are the needs for autonomy, competence, and relatedness (Ryan et al., 2006). Relatedness is the experience of feeling socially connected with other people (Ryan et al., 2006). Overall, a video game player who feels in control, effective, and related to others should experience positive psychological well-being, and a stronger motivation to continue playing the game (Ryan et al., 2006). However, relationships that lack meaning or support should be detrimental to the experience of relatedness (Bostan & Catak, 2016).

SDT has been applied to the study of video games for the past decade (Ryan et al., 2006). Ryan and colleagues (2006) state that other game play motivational taxonomies (e.g., Figure 1; Bartle, 1996; Yee, 2006) are constrained by the medium of current games and focus on classifying behaviors in games. Further, the researchers argue that SDT allows game motivation research to focus on how the game experience (e.g., enjoyment, intention to continue playing) and game characteristics (e.g., ease of control, structure, and content) relate to motivational tendencies and psychological needs that are shared across all humans (Ryan et al., 2006).

Uses and Gratifications Theory

The uses and gratifications theory of motivation has been applied to understand the reasons that people use certain media (Rubin, 2009; Ruggiero, 2000). Recently, the theory has been applied to understand why people play video games (Greenberg, Sherry, Lachlan, Lucas, &

Holmstrom, 2010; Sherry, Lucas, Greenberg, & Lachlan, 2006). The uses and gratification theory states that basic needs, individual differences, and contextual factors in society contribute to a set of motivations (Rosengren, 1974). The motivations drive people to use media to gratify their basic needs. Given that people vary from one another, media use has outcomes that differ within individuals and the society (Greenberg et al., 2010). Greenberg and colleagues (2010) suggest that game play motivation research focus on the reasons why people select specific game content, such as the genre of game, rather than establishing types of people playing games (e.g., Figure 1; Bartle, 1996).

Following Greenberg and colleague's (2010) suggestion, game play motivation researchers have found evidence that players with differing motives may play certain types of games. For example, one study sampled 18,627 multiplayer online battle arena (MOBA) game players and 18,819 massively multiplayer online (MMORPG) game players and found that 52.7% of the players from the MOBA game were motivated to improve their intelligence, whereas only 39.7% of the players in a massively multiplayer online role playing game (MMORPG) game wanted to improve intelligence (Kahn et al., 2015). Further, MOBA players were more motivated by competition (63.8%) than MMORPG players (33.7%; Kahn et al., 2015).

MOBA games typically require a player to control a character and play on a team to compete against an enemy team to conquer the opposing team's starting position. MOBA games may provide a game environment that supports a player's desire to improve intelligence and compete because they require a player to manage multiple sources of information and strategize how they will outplay other players. The goal of the gameplay for a MOBA game is consistent across multiple plays, which is to eliminate the opposing team's starting position. Conversely,

MMORPGs typically allow players to play with many other people simultaneously but give players much more freedom over the activities they perform in game. The game, *Chivaliers' Romance 3*, provided players with a persistent space to explore and “build semi-permanent relationships and communities”, which is not available in MOBA games (Kahn et al., 2015). Many MMORPGs support both competitive and non-competitive play. Therefore, players of an MMORPG could be motivated by other attributes beyond competition and improved intelligence.

The study conducted by Kahn and colleagues (2015) identified individual differences in player motivation between the two types of games. However, more research needs to be done to determine how motivations are related to gratifications (i.e., game satisfaction; Phan et al., 2016) and how gratifications are related to continued use (Hamari & Keronen, 2017). It is important to address these gaps in the literature to map out the reasons that people are satisfied with a video game and why they continue playing. A model of video game player motivations, satisfactions, and continuance intentions can be used to inform future research in video games.

Game Play Motivations

Describing the reasons people play video games has been a popular area of research in the past several decades (Bartle, 1996; Demetrovics et al., 2011; Hilgard, Engelhardt, & Bartholow, 2013; Kahn et al., 2015; Klug & Schell, 2006; Malone & Lepper, 1987; Ryan et al., 2006; Scharnow, Festl, Vogelgesang, & Quandt, 2015; Schuurman, De Moor, De Marez, & Van Looy, 2008; Sherry et al., 2006; Yee, 2006). Research on motivations aim to identify why players choose a game and continue playing (Yee, 2006). This section will examine the game play motivation literature in chronological order.

One early taxonomy of game play motivations was created by a game designer (Bartle, 1996). In the late 1980's, Bartle helped design text-based multiplayer role-playing games, called Multi-User Dungeons (MUDs). MUDs were a precursor to Massive Multiplayer Online Role Playing Games (MMORPG), such as *World of Warcraft* (WoW).

Bartle (1996) created a taxonomy of player motivations following a series of online discussions with players of his MUD (Bartle, 1996; Billieux et al., 2013). During the conversations, MUD players commented on aspects of the game that were satisfying, unsatisfying, reasons for playing, and recommended changes that could be made to improve the game (Bartle, 1996). Bartle noticed that players were expressing a variety of motives for playing, but the players tended to enjoy similar types of aspects of the game (Bartle, 1996). Player motivations could be grouped into four types, including Achievers, Explorers, Socializers, and Killers (Bartle, 1996). Achievers are interested in performing actions on the game world to accomplish in game goals and master elements of the game (Bartle, 1996). Explorers want to interact with the game world to discover as much about it as possible (Bartle, 1996). Socializers find enjoyment by interacting with other players (Bartle, 1996). Killers desire to perform actions to outperform or overpower other players (Bartle, 1996). A player could be classified into one of the four mutually exclusive types (Bartle, 1996).

Bartle (1996) assumed that a player's type can situationally change based on many factors, such as mood or gameplay goals. Nevertheless, the theory suggested that player types were categorical in nature. Categorical player types are useful for identifying different players, but does not allow players to exhibit multiple types simultaneously (Bartle, 1996; Yee, 2006). For example, a player classified as an Achiever will be motivated to master game mechanics and

progress in the game. Yet, the Achiever could not be classified as a Socializer, Explorer, or Killer. Bartle's (1996) player types are depicted in *Figure 1*.

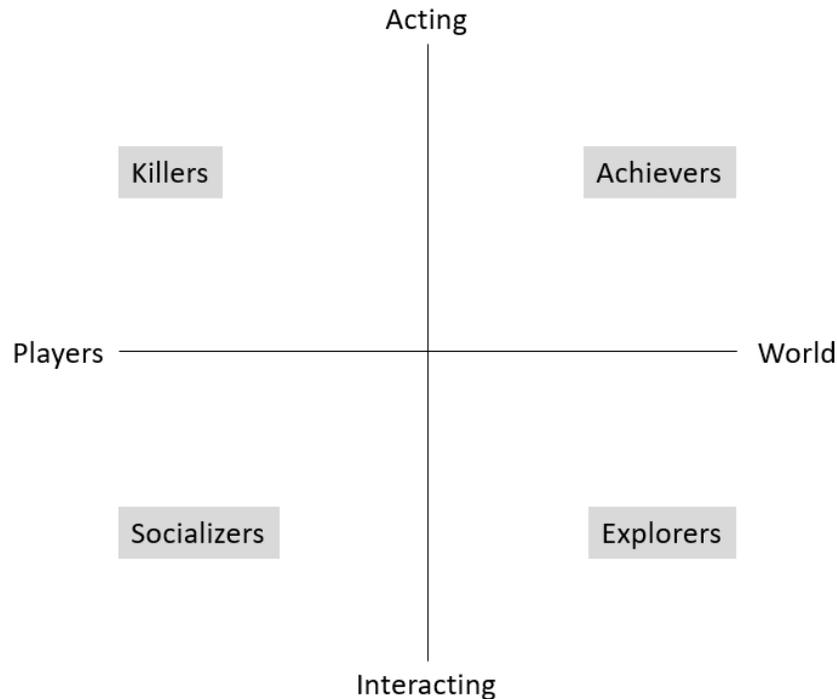


Figure 1. Bartle's player types. Adapted from Bartle (1996).

Bartle's (1996) taxonomy has been used as a theoretical foundation for balancing MUD games, suggesting that game designers include elements that appeal to all types of players (Bartle, 1996). Unfortunately, the taxonomy has not been empirically tested to validate the player types or generalize the results to games other than MUDs.

Expanding upon the work of Bartle, Yee (2006) created the first empirical model of game play motivations for MMORPG players. Player motivations were expanded from Bartle's original four player types and evaluated by 3,000 players from several different popular MMORPGs (Bartle, 1996; Yee, 2006). Instead of constraining player types to be mutually exclusive categories that described players, Yee (2006) used a factor analysis to identify the

components of player motivations. The factor analysis revealed three major components (i.e., Achievement, Social, Immersion) and ten subcomponents that drive people to play (Yee, 2006). Contrary to Bartle’s (1996) findings, relationships between the categories implied that the subcomponents of player motivations were not discrete categories (Bartle, 1996; Yee, 2006). Instead, player motivations seemed to be interrelated (Yee, 2006). Yee’s (2006) findings indicated that players can be motivated by multiple attributes of gameplay, such as achievement, social, and immersion, concurrently. Table 2 displays a summary of the characteristics associated with each motive.

Table 2

Yee’s (2006) Components that Motivate MMORPG Players

Achievement	Social	Immersion
Advancement Progress, Power, Accumulation, Status	Socializing Casual Chat, Helping Others, Making Friends	Discovery Exploration, Lore, Finding Hidden Things
Mechanics Numbers, Optimization, Templating, Analysis	Relationships Personal, Self-Disclosure, Find and Give Support	Role-Playing Story Line, Character History, Roles, Fantasy
Competition Challenging Others, Provocation, Domination	Teamwork Collaboration, Groups, Group Achievements	Customization Appearances, Accessories, Style, Color Schemes
		Escapism Relax, Escape from Real Life, Avoid Real-Life Problems

Although Yee (2006) found three major components, the structure of his initial taxonomy would not allow the three major components to be measured directly (Yee, 2006; Yee, Ducheneaut, & Nelson, 2012). Yee, Ducheneaut, and Nelson (2012) adapted and validated the

original scale to create a shorter scale that could measure the three major components of game play motivations (i.e., Social, Immersion, and Achievement). The shortened, Online Gaming Motivations Scale, was validated in non-western culture and shown to predict in game achievements (Yee et al., 2012).

Sherry, Lucas, Greenberg, and Lachlan (2006) started with a focus group to identify commonly cited themes of game play motivations. Focus group outcomes identified six dimensions for video game uses and gratifications, including Arousal, Challenge, Competition, Diversion, Fantasy, and Social Interaction (Sherry et al., 2006). Subsequently, the researchers created and assessed a 20-item scale to measure uses and gratification dimensions of game play motivation (Sherry et al., 2006). Each of the dimensions were found to be associated with the amount of play time. Although Sherry's (2006) approach was systematic, the research did not consider the full age range of video game players as the sample did not contain any players beyond 23 years old. Recent literature has found that motivations vary across age groups (Yee et al., 2012).

Ryan, Rigby, and Deci (2006) created the Player Experience of Need Satisfaction (PENS) measure of game play motivations, which was grounded in the self-determination theory by Ryan and Deci (2000). One aspect of self-determination theory (SDT) states that humans are driven to perform behaviors that satisfy basic psychological needs, including the need for autonomy, competence, and relatedness (Ryan & Deci, 2000). Autonomy represents the need to feel in control of the decisions or actions that they decide to take within a game (Ryan et al., 2006). Competence is the need to effectively overcome challenges without feeling overwhelmed (Ryan et al., 2006). Relatedness is the need to feel connected with other players (Ryan et al., 2006). Video games represent one tool in which a player can satisfy these needs. Further, Ryan

and colleagues (2006) suggest that the intrinsic motivation of the player is related to the experience of presence and the intuitiveness of the game controls. A series of studies were conducted using differing games and found that enjoyment of a game tends to increase when the game satisfies autonomy and competence needs (Ryan et al., 2006). Moreover, autonomy, competence, and relatedness were predictive of enjoyment and intentions to continue playing a game (Ryan et al., 2006). Recently, a study validated the original structure of the PENS. However, the factor analysis suggested that the scale had issues with discriminant validity between competence and intuitiveness of games controls (Johnson, Gardner, & Perry, 2018). Johnson and colleagues (2018) achieved acceptable validity after combining the two factors into a single construct.

Klug and Schell (2006) approached the idea of game play motivations and from a game design perspective. Based on 30 years of game design experience, the work categorizes players similarly to Bartle's method (Bartle, 1996; Klug & Schell, 2006). Specifically, the taxonomy characterizes player roles as a Competitor, Explorer, Collector, Achiever, Joker, Director, Storyteller, Performer, or Craftsman (Klug & Schell, 2006). Klug and Schell (2006) argue that player motivations can be described by multiple categories simultaneously, and that the game design will afford for the motivations that can be fulfilled within the game (Kahn et al., 2015; Klug & Schell, 2006).

Jansz and Tanis (2007) developed a motivation scale for first person shooter (FPS) games by adapting items from previous uses and gratifications studies. The items were tested using an exploratory principle component analysis. The analysis found seven motives, including Competition, Interest, Enjoyment, Fantasy, Social Interaction, Excitement, and Challenge (Jansz & Tanis, 2007).

Demetrovics and colleagues (2011) developed the Motives for Online Gaming Questionnaire (MOGQ) by identifying game play motivations in a literature review, expert review, and survey. Exploratory and confirmatory factor analysis was used to verify the structure of the scale. The scale contains factors for Social, Escape, Competition, Coping, Skill Development, Fantasy, and Recreation (Demetrovics et al., 2011). Whereas previous motivation literature studied player motives within a select type of game (i.e., MUDs, MMORPG), Demetrovics' method was not restricted to one type of online game (Demetrovics et al., 2011).

Hainey, Connolly, Stansfield, and Boyle (2011) adapted Malone and Lepper's (1987) taxonomy of intrinsic motivations for learning to assess which intrinsic motivation in the taxonomy are important to players (Hainey, Connolly, Stansfield, & Boyle, 2011; Malone & Lepper, 1987). Hainey and colleagues (2011) asked video game players to rate the importance of the intrinsic motivations, including individual motivations (i.e., challenge, fantasy, curiosity, control) and interpersonal motivations (i.e., cooperation, competition, and recognition). These intrinsic motivations are considered important in any learning situation (Malone & Lepper, 1987). Results indicated that challenge was ranked as the top motivation, whereas fantasy and recognition were ranked lowest (Hainey et al., 2011). Further, interpersonal factors (i.e., competition, cooperation, and recognition) were more important to online multiplayer gamers than solo, offline players (Hainey et al., 2011).

Lee, Lee, and Choi (2012) developed a motivation scale for social network games by reviewing previous game play motivations using an open-ended questionnaire with 35 social network game players. The scale items were tested using an exploratory principle component analysis and found six motives, including Social Interaction, Self-Presentation, Fantasy/Role

Playing, Passing Time/Escapism, Entertainment, and Challenge/Competition (J. Lee, Lee, & Choi, 2012).

Hilgard, Engelhardt, and Bartolow (2013) framed the study of game play motivations to better understand how they are related to the pathology of the player (e.g., addiction, excessive use) while maximizing the ability of the scale to discriminate between players of different games. Items from Sherry and colleague's (2006) motivation scale and 100 additional items developed by the researchers to assess individual differences in preferences and motives were tested using an exploratory and confirmatory factor analyses (Hilgard et al., 2013; Sherry et al., 2006). The analysis identified 9 factors, including Story, Violent Catharsis, Violent Reward, Social Interaction, Escapism, Loss-Sensitivity, Customization, Grinding, and Autonomy (Hilgard et al., 2013). The instrument was called the Gaming Attitudes, Motivations, and Experience Scales (GAMES). Table 3 depicts the definitions of each factor in the GAMES.

Table 3

Hilgard et al.'s (2013) GAMES Factors that Motivate Players

Factor	Meaning
Story	Whether game stories are important, engaging, and emotionally compelling.
Violent catharsis	Whether game violence is perceived to help harmlessly release negative moods or aggression.
Violent reward	Whether game violence provides positive or thrilling emotions such as satisfaction or power.
Social interaction	Playing games with a group, developing personal relationships with other players.
Escapism	Using games to regulate dysphoric moods or to escape the frustrations of daily life.
Loss aversion	Tendency of a loss to frustrate or to “spoil the fun.” Likely subsumes search for challenge.
Customization	Interest in in-game creative pursuits like personalizing an in-game avatar or building a house.
Grinding/completion	Attitudes toward performing repetitive actions or paying real-life money to earn in-game rewards; interest in performing every possible action in a game or collecting every in-game item.
Autonomy/exploration	Enthusiasm for games with many choices, options, multiple solutions to puzzles, and open areas to explore.

Scharkow, Festl, Vogelgesang, and Quandt (2015) developed a Gaming Gratification Short Scale (GCS) based on previous motivation research (e.g., Sherry et al., 2006; Yee, 2006) that outlined individual (i.e., fantasy, competence, exploration), social (social capital, teamplay, competition), and content-related (i.e., mechanics, narration) gratifications that players seek out during game play. A confirmatory factor analysis confirmed that the GCS model had a good fit (Scharkow et al., 2015). The authors surveyed 4,500 German gamers and found that individual and content-related motives are predictive of genre preferences (Scharkow et al., 2015).

Kahn and colleagues (2015) developed a scale of game play motivations, called the Trojan Player Typology, that assesses the extent to which players are Socializers, Completionists, Competitors, Escapists, Story-driven, and Smarty-pants (e.g., intellectually driven). To develop the Trojan Player Typology, seventeen video game researchers independently examined previous literature (Bartle, 1996; Hainey et al., 2011; Jansz & Tanis, 2007; Klug & Schell, 2006; Sherry et al., 2006; Yee, 2006) and generated items related to game play motives (Kahn et al., 2015). The scale was assessed in a pilot sample of 381 people using an exploratory factor analysis and shortened for parsimony (Kahn et al., 2015). Further, the scale was validated across two game types (i.e., League of Legends is a Multiplayer Online Battle Arena game, Chevaliers' Romance 3 is a Massively Multiplayer Online game) and two cultures (i.e., North America and Chinese) and found acceptable model fit across both cases (Kahn et al., 2015).

Table 4 describes the definitions of each factor in the Trojan Player Typology. A characteristic of the Trojan Player Typology is that each player can express any amount of each factor. For example, a player might play to build and maintain social relationships and complete everything the game has to offer, but have no desire to play to compete, escape from reality, experience the story, or improve intellect. Similar to Yee's (2006) Online Gaming Motivation Taxonomy, players could be motivated by all the factors concurrently.

Table 4

Kahn et al.'s (2015) Dimensions of Trojan Player Typology

Factor	Definition
Socializers	Play to build and maintain social relationships.
Completionists	Play to explore all elements of a game fully.
Competitors	Play to win the game and behave in ways that contribute to victory.
Escapists	Play to escape from real life.
Story-driven	Play to experience stories in the game world and learn about character backstories.
Smarty-pants	Play to improve intellect and enhance intelligence.

Bostan and Catak (2016) created a survey of game play motivations based on the psychological need framework (Murray, 1938) and found five factors (Affiliation, Power, Achievement, Self-Protection, and Curiosity). Further, the authors used cluster analysis to identify common groupings of player profiles in a sample of 503 game players (Bostan & Catak, 2016). Cluster analysis identified six player types, including Casual Players, Affiliation Seekers, Power Seekers, Impression Managers, Aggressors, and Intellectuals (Bostan & Catak, 2016).

Table 5 lists the studies that created game play motivation scales and describes the strengths and weaknesses of each game play motivation scale.

Table 5

Strengths and Weaknesses of Existing Game Play Motivation Scales

Scale or Questionnaire	Number of Items	Factors	Creation Method	Validation Method	Game Type	Strengths	Weaknesses
Player Types by Bartle (1996)	N/A	Achievers, Explorers, Socializers, Killers	Qualitative: Interviews	N/A	Online: MUD	<ul style="list-style-type: none"> Player types were related to game design to balance MUDs 	<ul style="list-style-type: none"> Limited to one online game type No empirical validation
Online Gaming Motivation Taxonomy by Yee (2006)	39	<p>Social: Socializing, Relationship, Teamwork</p> <p>Immersion: Discovery, Role-playing, Customization, Escapism</p> <p>Achievement: Advancement, Mechanics, Competition</p>	Mixed: Literature Review, Bartle's (1996) Player Types, PCA	PCA	Online: MMORPG	<ul style="list-style-type: none"> First empirically validated scale 	<ul style="list-style-type: none"> Limited to one online game type Cannot be used to directly assess 3 high level factors Items were derived from Bartle's (1996) Player Types
Online Gaming Motivations Scale by Yee et al. (2012)	12	Social, Immersion, Achievement	Quantitative: EFA	<p>CFA</p> <p>CFA for cross-cultural validation</p> <p>Regression on in-game achievement</p>	Online: MMORPG	<ul style="list-style-type: none"> Shortened version of Yee (2006) scale to assess high-level factors Strong creation method Cultural validation Predictive validation 	<ul style="list-style-type: none"> Limited to one online game type

Table 5 (continued)

Scale or Questionnaire	Number of Items	Factors	Creation Method	Validation Method	Game Type	Strengths	Weaknesses
Video Game Uses and Gratifications Instrument by Sherry et al. (2006)	20	Competition, Challenge, Social Interaction, Diversion, Fantasy, Arousal	Mixed: Focus Groups, EFA	Regression on time played	Not specified	<ul style="list-style-type: none"> • Factors predict time played • No game type restrictions • Based on theory of uses and gratifications 	<ul style="list-style-type: none"> • No game types specified during development • Only studied ages 23 and younger • No factor analysis for validation
Player Experience of Need Satisfaction (PENS) by Ryan et al. (2006)	22	Autonomy, Competence, Relatedness, Presence, Intuitive Controls	Qualitative: Literature Review, SDT Theory (Ryan & Deci, 2000)	Regression on enjoyment, future play, play time, and mood CFA (Johnson et al., 2018)	Offline: Platformer, Adventure, Fighting, Rail-shooter, Arcade racing Online: MMO	<ul style="list-style-type: none"> • Factors predict enjoyment and intentions to play in the future • Factor analysis validation (Johnson et al., 2018) 	<ul style="list-style-type: none"> • Costs money to use • Discriminant validity issues between competence and intuitiveness of controls (Johnson et al., 2018)
Why people play games: An industry perspective by Klug & Schell (2006)	N/A	Competitor, Explorer, Collector, Achiever, Joker, Director, Storyteller, Performer, Craftsman	N/A	N/A	None specified	<ul style="list-style-type: none"> • Motives are described from a game design perspective 	<ul style="list-style-type: none"> • No empirical creation or validation
First Person Shooter (FPS) game play motivation questionnaire by Jansz & Tanis (2007)	Not Specified	Competition, Interest, Enjoyment, Fantasy, Social Interaction, Excitement, Challenge	Mixed: Literature Review, PCA	Regression on play time	Online: FPS	<ul style="list-style-type: none"> • Factors predict time played • Based on theory of uses and gratifications • Specialized to FPS 	<ul style="list-style-type: none"> • No factor analysis for validation • Limited to one online game type • Scale items not available in article

Table 5 (continued)

Scale or Questionnaire	Number of Items	Factors	Creation Method	Validation Method	Game Type	Strengths	Weaknesses
Motives for Online Gaming Questionnaire (MOGQ) by Demetrovics et al. (2011)	27	Social, Escape, Competition, Coping, Skill Development, Fantasy, Recreation	Mixed: Literature Review, Interviews, Independent review by 3 coders, EFA, CFA	CFA	Online: All types	<ul style="list-style-type: none"> • Generalizable to all online game types • Strong creation method 	<ul style="list-style-type: none"> • No game types specified during development • No cross-cultural validation (Hungarian population)
Reasons for playing computer games questionnaire by Hainey et al. (2011)	7	Individual: Challenge, Fantasy, Curiosity, Control Interpersonal: Cooperation, Competition, Recognition	Qualitative: Adapted Malone & Lepper's (1987) taxonomy for intrinsic motivations for learning	N/A	Online & Offline: No games specified	<ul style="list-style-type: none"> • Based on previous work on intrinsic motivations • Identified differences between online and offline players 	<ul style="list-style-type: none"> • No empirical creation or validation • No game types specified
Social Network Game (SNG) play motivation scale by Lee et al. (2012)	36	Social Interaction, Self-Presentation, Fantasy/Role Playing, Passing Time/Escapism, Entertainment, Challenge/Competition	Mixed: Literature Review, Questionnaire, PCA	PCA	Online: SNG	<ul style="list-style-type: none"> • Specialized to SNG 	<ul style="list-style-type: none"> • Limited to one online game type
Gaming Motivation Scale (GAMS) by Lafreniere et al. (2012)	18	Intrinsic Motivation, Integrated Regulation, Identified Regulation, Introjected Regulation, External Regulation, Amotivation	Mixed: Literature Review, Adapted PENS (Ryan et al., 2006), CFA	CFA	Online & Offline: All types	<ul style="list-style-type: none"> • Based on Self Determination Theory • Generalizable to all online game types 	<ul style="list-style-type: none"> • No game types specified during development

Table 5 (continued)

Scale or Questionnaire	Number of Items	Factors	Creation Method	Validation Method	Game Type	Strengths	Weaknesses
Gaming Attitudes, Motivations, and Experiences Scales (GAMES) by Hilgard et al. (2013)	59	Story, Violence Catharsis, Violent Reward, Social Interaction, Escapism, Loss-Aversion, Customization, Grinding/Completion, Autonomy/Exploration	Mixed: Literature Review, Sherry et al.'s (2006) Uses and Gratifications, EFA	CFA	Online & Offline: 3 favorite games, and 3 currently played	<ul style="list-style-type: none"> • Included motives related to game pathology • Generalizable to all game types (online and offline) 	<ul style="list-style-type: none"> • Nostalgia influenced participants listings of favorite games • Open response for game type created a loss of statistical power as some games were not included in analysis
Gaming Gratification Short Scale (GCS) by Scharkow et al. (2015)	15	<p>Individual: Exploration, Competence, Fantasy</p> <p>Social: Teamplay, Competition, Social Capital</p> <p>Content: Mechanics, Narration</p>	Mixed: Literature Review, Uses and Gratifications Theory	CFA	Online & Offline: No games specified	<ul style="list-style-type: none"> • Random sample from representative sample of Germans • Generalizable to all game types (online and offline) 	<ul style="list-style-type: none"> • No cross-cultural validation (German population)

Table 5 (continued)

Scale or Questionnaire	Number of Items	Factors	Creation Method	Validation Method	Game Type	Strengths	Weaknesses
Trojan Player Typology by Kahn et al. (2015)	15	Socializer, Completionist, Competitor, Escapist, Story-driven, Smarty-pants	Mixed: Literature Review, Independent review by 17 game researchers, pilot sample, EFA	CFA for cross-genre validation CFA for cross-cultural validation Construct validity via correlations between motives and similar self-report scales and in game behaviors	Online: MOBA & MMO	<ul style="list-style-type: none"> • Random sample of LOL players used for initial validation • Generalizable to multiple game types (MMO, MOBA) • Assessed the extent that game behaviors are related to motivations 	<ul style="list-style-type: none"> • No validation in genres beyond MMO and MOBA • Cannot directly compare differences between validation studies because different genres and cultures were used
Player motivations by Bostan & Catak (2016)	18	<p>Motives: Affiliation, Power, Achievement, Self-Protection, Curiosity</p> <p>Player Types: Casual, Affiliation Seekers, Power Seekers, Impression Managers, Aggressors, Intellectuals</p>	Mixed: Adapted from psychological need framework (Murray, 1938), PCA	Cluster analysis to classify player types	Offline: RPG	<ul style="list-style-type: none"> • Only study to use cluster analysis to classify player types from profiles of motive scores 	<ul style="list-style-type: none"> • No factor analysis for validation • Limited to one game type (offline, RPG)

Continuance Intention

The concept of continuance intentions have been investigated in the information systems (IS) literature to identify the precursors to a user's intention to continue using a particular product or service (Bhattacharjee, 2001a, 2001b) or the intention to continue purchasing a product (Zeithaml, Berry, & Parasuraman, 1996). Continuance intention is defined as an individual's intent to recurrently participate in a task (Bhattacharjee, 2001a; Liao, Huang, & Teng, 2016). In gaming research, the term has been used synonymously with task continuance (Huang, Huang, Chou, & Teng, 2017; Liao et al., 2016), continued intention to use (M.-C. Lee & Tsai, 2010), sustained use (Wohn, 2013), and loyalty (Choi & Kim, 2004; Teng & Chen, 2014). For the purposes of this research, gamer loyalty will be considered the same as continuance intentions as they both have been characterized as the intention of a player to continue playing one game instead of another.

The likelihood that a player continues playing a game may be crucial for the financial well-being of the game (Reichheld & Scheffer, 2000; Teng & Chen, 2014). In fact, the financial strength of an online game company depends on a community of players that continually plays (Teng, 2017). Continual play is particularly important in free to play games, because the monetization model depends on the player repeatedly viewing advertisements or buying game items (Nguyen, 2015). Further, online gamers have a tendency to switch to alternative games (Li et al., 2015; Nguyen, 2015).

There may be many reasons for an individual to decide not to continue playing an online game. For example, game play experience embodies a pivotal role in the player's intention to continue playing. The self-determination approach suggests that satisfying the needs of autonomy, competence, and relatedness is related to enjoyment of the game and predicts

intentions to continue playing the game (Ryan et al., 2006). Thus, an experience that is too challenging or not challenging enough, lacking supportive social connections, or preventing the player from making their own decisions may be a determinant of the player quitting the game (Ryan et al., 2006). Although satisfaction may play a role in maintaining a player, satisfaction alone does not prevent players from switching to alternative games (Li et al., 2015).

In the gaming literature, research has typically focused on modeling the factors that keep people playing an online game (Chang, Liu, & Chen, 2014; Ghazali, Mutum, & Woon, 2018; Li et al., 2015; Liang & Yeh, 2011; Nguyen, 2015) or hinder continuance intention (Liao et al., 2016). Research has suggested that higher satisfaction (Anderson & Srinivasan, 2003; Bhattacharjee, 2001a), perceived enjoyment (Davis, Bagozzi, & Warshaw, 1992; M.-C. Lee & Tsai, 2010; Merikivi, Tuunainen, & Nguyen, 2017; Nguyen, 2015; Wu, Wang, & Tsai, 2010), disconfirmation of expectations (Liao et al., 2016), and social connection (Ryan et al., 2006; Teng & Chen, 2014; Wu et al., 2010) are common drivers of continuance intention. Frustration has been associated with decreased continuance intention, but only in gamers who play frequently and have not been playing for many years (Liao et al., 2016).

Huang, Huang, Chou, and Teng (2017) tested a comprehensive model of online gamer loyalty to assess the relationships between player temperament, character, and continuance intention. The study found that several player traits (persistence, novelty seeking, and reward dependence) were related to increased player skill, challenge, and flow, which resulted in higher intention to repeatedly play a game (Huang et al., 2017). Specifically, players with higher persistence and novelty seeking tended to be more skilled. Those with higher novelty seeking and reward dependence tended to feel more challenged. Players who were more cooperative felt

more interdependent with other players. Ultimately, players with higher skill, challenge, interdependence, and flow had greater intention to repeatedly play a game (Huang et al., 2017).

One limitation of the research on gaming continuance intention is that many models assess intention to continue before the player has adopted the game (Nguyen, 2015). Few papers approach the study of continuance from the perspective of a player that is currently playing a game (Liang & Yeh, 2011; Liao et al., 2016; Wohn, 2013). This is a problem because the frequency of prior play may be the strongest predictor of continuance intention, as it reduces variability that can be attributed to other predictors (Ajzen, 2002; Wohn, 2013). Therefore, the relationships between post-adoption game satisfaction and continuance intention needs to be further explored.

Purpose

This research takes a uses and gratifications theory approach to explore the relationships between game play motivations and satisfaction (i.e., game play gratifications; Phan et al., 2016). Further, this research aims to assess the relationships between the motivations for use, game satisfaction, and intentions to continue playing a game, as suggested by previous literature (Greenberg et al., 2010; Hamari & Keronen, 2017).

Hypothesized Research Framework

A series of structural equation models were assessed to find the model with the best fit. Although multiple models were tested, the following model was created to depict the hypothesized relationships between player motivations, perceived fulfillment of game motives, game satisfaction, play time, and intentions to continue playing. See *Figure 2* for a depiction of the research framework.

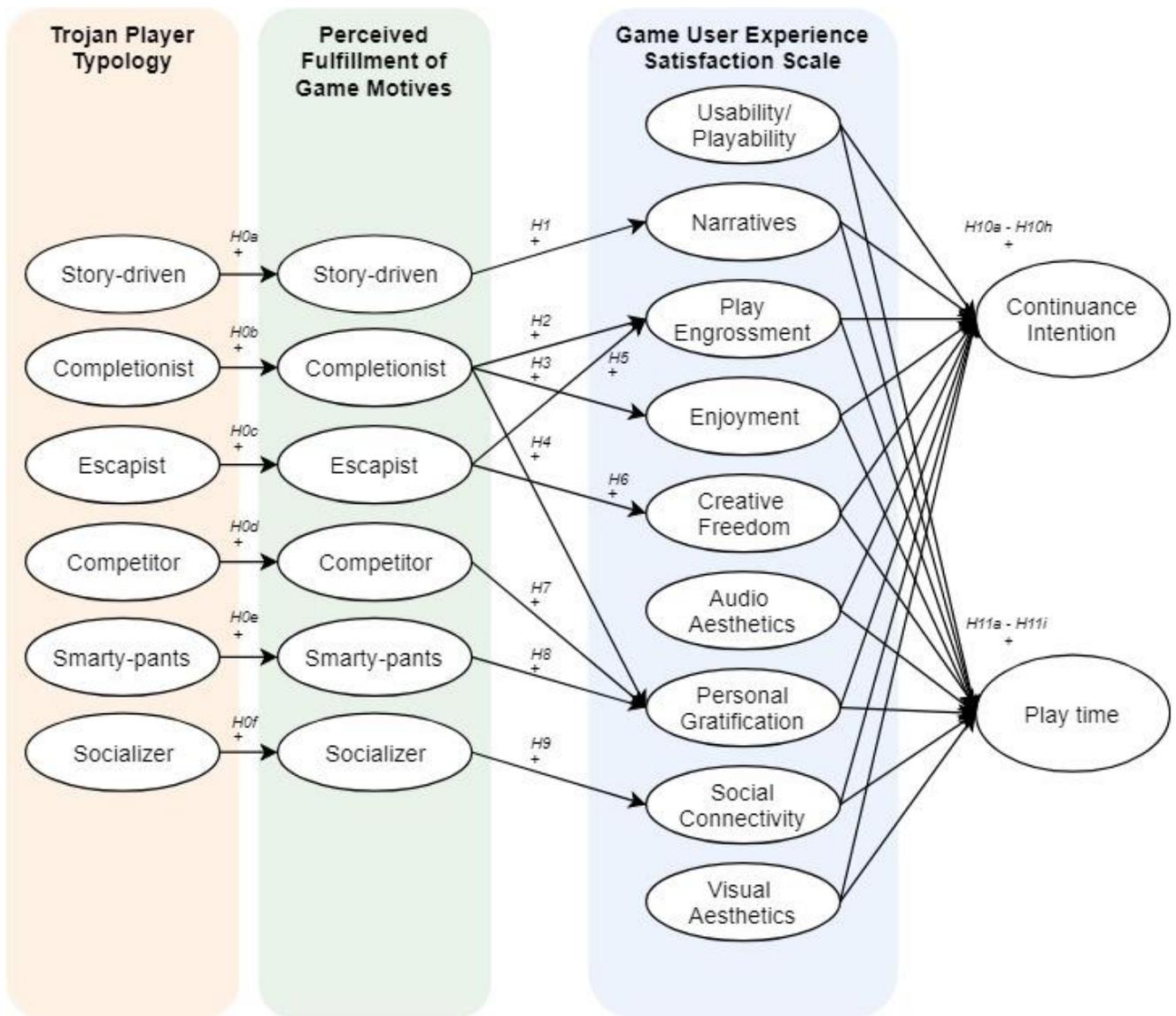


Figure 2. Hypothesized research framework.

Ultimately, this research aims to answer the following research questions:

1. How are motives related to satisfaction?
2. How is satisfaction related to continuance intention?
3. How is satisfaction related to play time?

Given that the measures for motives and satisfaction have multiple sub-constructs, the following exploratory hypotheses are proposed (Table 6).

Table 6

Hypotheses

Hypothesis	Justification
<p>H0a – f. Motivations are positively related to their corresponding fulfillment of game motive.</p>	<p>The uses and gratification theory states that basic needs, individual differences, and contextual factors in society contribute to a set of motivations that drive people to use media to gratify their needs (Rosengren, 1974). If people are playing a game to gratify their motivations, then each motive should be fulfilled in the game. Thus, motivations should be positively related to fulfillment of the motive.</p>
<p>H1. Perceived fulfillment of story driven motivations are positively related to narratives.</p>	<p>Story driven motives are the desire to play to experience stories in the game world and learn about character backstories. The narratives construct of the GUESS is assessing player satisfaction of the story aspects of the game (e.g., events and characters) and their abilities to capture the player’s interest and shape the player’s emotions. Those who have been fulfilled in their story driven needs should have a positive narrative satisfaction.</p>
<p>H2. Perceived fulfillment of completionist motivations are positively related to play engrossment.</p>	<p>Completionist motives are the desire to play to explore all elements of a game fully. Earning achievements in game can be intrinsically motivating to players (Cruz, Hanus, & Fox, 2017). Play engrossment is the degree to which the game can hold the player’s attention and interest. Fulfillment of completionist motives should be positively related to a player’s engrossment in the game.</p>

Table 6 (continued)

Hypothesis	Justification
H3. Perceived fulfilment of completionist motivations are positively related to enjoyment.	Completionist motives are the desire to play to explore all elements of a game fully. Enjoyment is the amount of pleasure and delight that was perceived by the player as a result of playing the game. Fulfillment of completionist motives should be positively related to a player's enjoyment in the game.
H4. Perceived fulfilment of completionist motivations are positively related to personal gratification.	Completionist motives are the desire to play to explore all elements of a game fully. Personal gratification is the player's satisfaction with the motivational aspects of the game (e.g., challenge) that promote the player's sense of accomplishment and the desire to succeed and continue playing the game. Fulfillment of completionist motives should be positively related to a player's satisfaction of their accomplishments (i.e., personal gratification).
H5. Perceived fulfilment of escapist motivations are positively related to play engrossment.	Escapist motives are the desire to play to escape from real life. Play engrossment is the degree to which the game can hold the player's attention and interest. Fulfillment of escapist motives should be positively related to a player's engrossment in the game.
H6. Perceived fulfilment of escapist motivations are positively related to creative freedom.	Escapist motives are the desire to play to escape from real life. Creative freedom is the extent to which the game is able to foster the player's creativity and curiosity and allows the player to freely express his or her individuality while playing the game. Fulfillment of escapist motives should be positively related to a player's freedom to express their individuality in the game.

Table 6 (continued)

Hypothesis	Justification
<p>H7. Perceived fulfilment of competitor motivations are positively related to personal gratification.</p>	<p>Competitor motives are the desire to play to win the game and behave in ways that contribute to victory. Competitiveness has been shown to positively influence player satisfaction (Sepehr & Head, 2018). Personal gratification is the players satisfaction with the motivational aspects of the game (e.g., challenge) that promote the player’s sense of accomplishment and the desire to succeed and continue playing the game. Fulfillment of competitor motives should be positively related to a player’s satisfaction of their accomplishments (i.e., personal gratification).</p>
<p>H8. Perceived fulfilment of smarty-pants motivations are positively related to personal gratification.</p>	<p>Smarty-pants motives are the desire to play to improve intellect or enhance intelligence. Personal gratification is the players satisfaction with the motivational aspects of the game (e.g., challenge) that promote the player’s sense of accomplishment and the desire to succeed and continue playing the game. Fulfillment of smarty-pants motives should be positively related to a player’s satisfaction of their accomplishments (i.e., personal gratification).</p>
<p>H9. Perceived fulfilment of Socializer motivations are positively related to social connectivity.</p>	<p>Socializer motives are the desire to play to build and maintain social relationships. The social connectivity construct of the GUESS is assessing the degree to which the game facilitates social connection between players through its tools and features. Fulfillment of socializer motives should be positively related to social connectivity.</p>
<p>H10a – i. GUESS subscale scores are positively related to continuance intentions.</p> <p>H11a – i. GUESS subscales scores are positively related to play time.</p>	<p>Given the linkages between satisfaction and continuance intention, it is hypothesized that all measures of game satisfaction from the GUESS will be positively related to continuance intention and game play time.</p>

CHAPTER 2

METHOD

This research used a stratified sampling approach to gather survey data from individuals who play different types of online video games. Four popular online games were identified because each had a distinct player experience from one another. The games included *League of Legends* (Riot Games, 2017), *World of Warcraft* (Blizzard Entertainment, 2017c), *Overwatch* (Blizzard Entertainment, 2017b), and *Hearthstone* (Blizzard Entertainment, 2017a). Each game represented a stratum from which participants were recruited. Online video games require an internet connection. As a side effect, online games typically enable players to play and socialize with other players connected to the game. Further, similar to many other online games, the games chosen for this research did not have a logical ending. Instead, players are encouraged to continually play to experience a cycle of content (e.g., competitive seasons, expansions, new aspects of the game).

Game Descriptions

League of Legends is a three to five player, team multiplayer online battle arena (MOBA) game that currently maintains over 100 million players every month (Riot Games, 2017).

League of Legends is a free-to-play game that must be played on a computer (Microsoft Windows or Macintosh). Players can purchase loot boxes, which randomly provide cosmetic items (e.g., character skins). Typically, the goal of a MOBA game is to work with a team to destroy the enemy base. See *Figure 3* below for an image of typical game play.

LEAGUE of LEGENDS

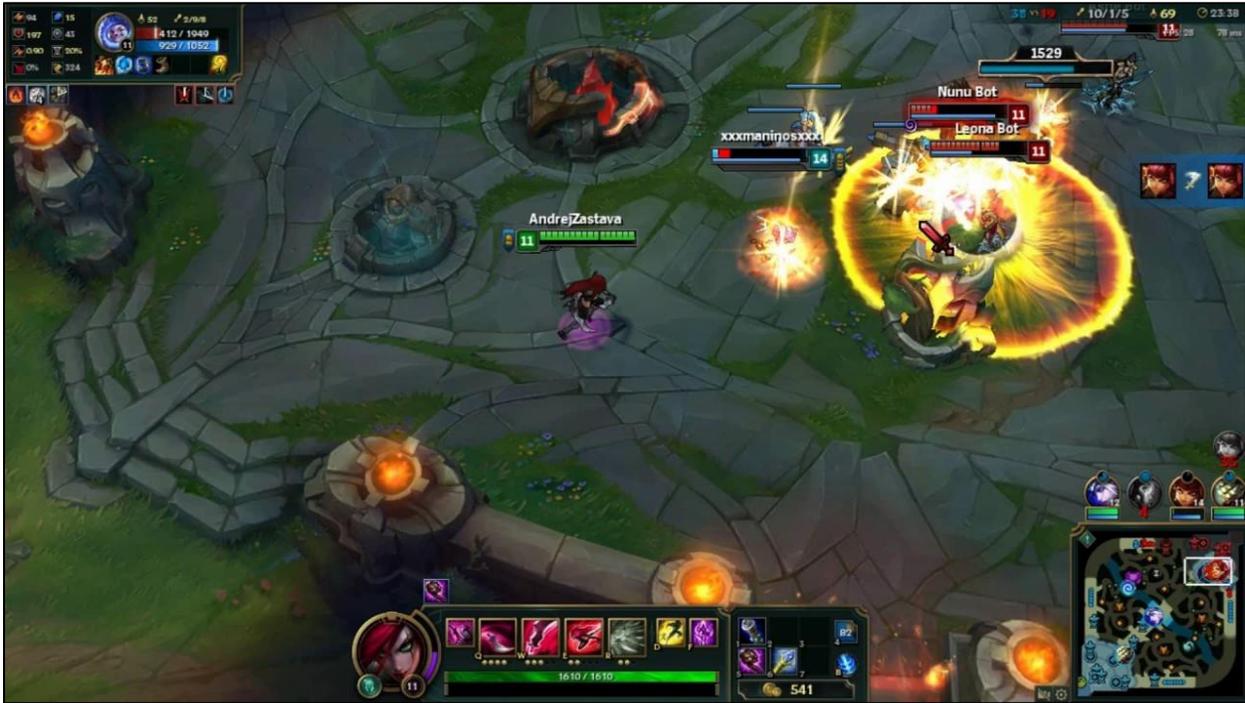


Figure 3. League of Legends game play.

World of Warcraft is a massively multiplayer online role-playing game (MMORPG) that had over 10 million monthly subscribers in late 2016 (Harper, 2016). *World of Warcraft* requires a player to purchase the game and pay a monthly subscription fee of approximately \$15 to play the game on a computer (Microsoft Windows or Macintosh). Players can purchase tokens that can be converted to gold or subscription time credits. Additionally, players can purchase in game mounts and pets. Typically, MMORPG players have a choice of whether they want to play solo or in a group to experience the story, explore the world, or compete against other players. See *Figure 4* below for an image of typical game play.

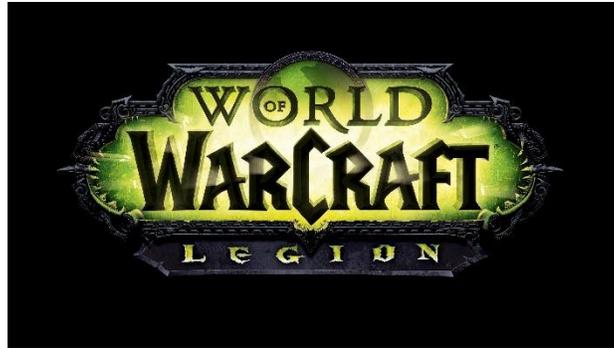


Figure 4. World of Warcraft game play.

Overwatch is a six person team, first person shooting (FPS) game that currently has over 30 million registered players (Sarkar, 2017). *Overwatch* requires a player to purchase the game, but there is no monthly subscription. *Overwatch* can be played on multiple devices, including computers (Microsoft Windows or Macintosh) or game consoles (Microsoft Xbox One or Sony PlayStation 4). Players can purchase in game items, called loot boxes, which randomly provide character skins, voice clips, signatures, and gold. Additionally, loot boxes can be purchased for in game gold or gained through leveling up. All items can be purchased with currency earned in

game. Typically, the goal of a team-based FPS game is to work with a team to eliminate the opposing team and attack or defend a position in the game world. See *Figure 5* below for an image of typical game play.



Figure 5. Overwatch game play.

Hearthstone is a one to two player, online collectible card video game (CCG) that currently has over 70 million players (Kollar, 2017). *Hearthstone* is a free-to-play game that can be played on multiple devices, including computers (Microsoft Windows or Macintosh), mobile phones or tablets (Apple iOS or Android). Players can purchase in game card packs, which randomly provide cards. Typically, the goal of a CCG is to work manage and play with a deck of

Sample Size Estimation

Although the number of indicators, factors, and factor loadings play a role in determining the appropriate sample size for structural equation modeling (SEM), a common rule of thumb for estimating minimum sample size requirements for a SEM is to include 10 participants per variable (Wolf, Harrington, Clark, & Miller, 2013). The research framework discussed in Figure 2 indicates 23 variables, which suggests that this study should have recruited a minimum sample size of 230. Marsh, Balla, and Hau (1996) suggest that the minimum sample size for an SEM should take into consideration the ratio of indicators to latent variables in the model, using the following formula to calculate minimum sample size,

$$n \geq 50r^2 - 450r + 1100$$

where r is the ratio of indicators to latent variables (Marsh, Balla, & Hau, 1996). This research had 92 indicators, 23 latent variables, with an r equal to 4. Marsh, Balla, and Hau's technique suggests a minimum sample size of 100 (Marsh et al., 1996).

Procedure

Institutional Review Board approval was obtained from Embry Riddle Aeronautical University and Wichita State University prior to gathering data. To ensure sufficient sample size for SEM, 353 participants were recruited through the Wichita State University SONA system, Embry Riddle SONA system, Amazon Mechanical Turk, and posts on video game related websites and forums (e.g., reddit.com/r/samplesize, game related discord). Participants in this research were eligible if they played at least one of the games identified more than 10 hours in the past three months. This play time criteria has been used in previous literature examining game satisfaction to ensure a participant has had ample and recent play time to report game

satisfactions (Phan et al., 2016). Once participants were recruited, they took an online questionnaire. Each questionnaire session lasted approximately 30 to 45 minutes.

Participants

Three hundred fifty-three participants met the inclusion criteria for analyses. 59.8% of the participants were male, 38.8% were female, and 1.4% other. Participant ages ranged from 18 to 49 years old ($M = 22.95$, $SD = 5.84$). Approximately 79% identified themselves as “Casual” or “Mid-core/Core” gamers. On average, participants played the game for over 10 hours per week ($M = 10.89$, $SD = 11.81$). Table 7 present a summary of participant demographics.

Table 7

Participant Demographics

Variable	Entire sample (N = 353)
Player Type	
Newbie/Novice	7.9%
Casual	39.9%
Mid-core/Core	38.8%
Hardcore/Expert	13.3%
Gender	
Male	59.8%
Female	38.8%
Other	1.4%
Ethnicity	
American Indian/Alaska Native	1.1%
Asian/Pacific Islander	14.7%
Biracial/Multiracial/Mixed	3.7%
Black/African American	3.4%
Hispanic/Latino	8.8%
White (not of Hispanic origin)	66.3%
I do not wish to answer	2.0%

Table 7 (continued)

Variable	Entire sample (N = 353)
Education Level	
Less than high school	0.3%
High school graduate	21.5%
Some college	47.0%
2 year degree	10.2%
4 year degree	14.4%
Masters	5.1%
Professional degree	1.4%
Age in years, <i>Mean (SD)</i>	22.95 (5.84)
Age Range	18 - 49
Weekly Play Time in hours, <i>Mean (SD)</i>	10.89 (11.81)
Overall Satisfaction Level, <i>Mean (SD)</i>	5.74 (1.23)
Overall GUESS Score, <i>Mean (SD)</i>	49.88 (6.42)

Measures

The online questionnaire assessed demographic information, previous game experience, video game play motivations, perceived fulfillment of game motives, game satisfaction, play time, and intentions to continue playing a game. Table 8 lists the survey measure names and sources.

Table 8

Survey Measure Name and Source

Measure (No. of items)	Published Name	Author
Demographics (6)	N/A	N/A
Game Experience (12)	Game Experience Screener	Phan, Keebler, & Chaparro (2016)
Weekly Play Time (1)	Play Intensity/Frequency	Wohn (2013)
Game Motivations (15)	Trojan Player Typology	Kahn et al. (2015)
Perceived Fulfillment of Game Motives (15)	N/A	Self-created, adapted from Kahn et al. (2015)
Game Satisfaction (55)	Game User Experience Satisfaction Scale (GUESS)	Phan, Keebler, & Chaparro (2016)
Intentions to Continue Playing (4)	Continuance Intention	Hsaio & Chiou (2017)

Note: Appendix A lists the items and constructs for each measure.

Influence of Game on Motivations

Each of the games chosen for this research provided content and mechanics that afford players a way to gratify the motivations described by the Trojan Player Typology (Kahn et al., 2015). Game elements that may allow players to gratify motives are described in the following section. Refer to Appendix I for a summary on how game motives can be fulfilled in each game.

All the games are online games, which typically provide a method to socialize by interacting and chatting with other players. *League of Legends* and *Overwatch* require players to join teams and work together during game tasks. These games provide a structure for players to use in game nonverbal pings, emotes, or voice chat to communicate with other players. *World of Warcraft* allows players to join teams to compete versus other players (i.e., player versus player),

random groups to defeat enemies (i.e., player versus environment), and large-scale communities, called guilds. This game provides in game text-based chat channels, voice chat, and mail.

Hearthstone provides the least support for players who desire to socialize, allowing for text-based chat messages to be shared with other players. Consequently, *Hearthstone* may be the least suited to gratify socializer motivations.

All the games deliver competitive game play. *League of Legends* and *Overwatch* require teams of players to compete versus another team of players or simulated players (i.e., bots) on a map to conquer an objective point. *Hearthstone* requires a player to compete against another player or bot to eliminate the other player from the game. *World of Warcraft* provides an optional range of battlegrounds, arenas, or world zones in which players from opposing factions can compete to conquer objectives, eliminate other players, or capture the flag. Further, teams or guilds can compete on leaderboards for the fastest time to complete a dungeon or raid. Given that competition is largely optional in *World of Warcraft*, it may be the least suited to gratify competitor motivations.

Each game allows players to earn achievements, explore, collect game items, and master skills which provides an avenue to satisfy a player that wants to complete all elements of the game (Kahn et al., 2015). Thus, all games are suited to gratify completionist motivations.

The games allow players to take on the role of a character to do things they cannot do in real life, which may gratify players with escapist motives (Kahn et al., 2015). However, *World of Warcraft* has game elements (e.g., role playing, character building and personalization) and character backstory that may exceed the descriptions provided by the other games. Conversely, *Hearthstone*, *League of Legends*, and *Overwatch* do not provide much of a narrative throughout

the game compared to *World of Warcraft*. As a result, *World of Warcraft* may be better suited to gratify escapism and story-driven motivations.

Finally, each game allows players to employ tactics to outwit enemies, level up efficiently, and increase in skill. Although there is no definitive evidence suggesting that playing games improves intellect, there have been studies that suggest that action video games have a positive impact on perceptual, attentional, and cognitive skills (Bediou et al., 2018). Regardless of whether or not players actually improve intellect, many players may seek to play games in an attempt to “improve brain power or enhance intelligence” (Kahn et al., 2015). If they do, all games are suited to gratify “smarty-pants” motivations (Kahn et al., 2015). Appendix I summarizes how game motives can be fulfilled in each game.

CHAPTER 3

RESULTS

A Confirmatory Factor Analysis (CFA) was conducted to test how well the proposed measurement model fit the data. Another goal of the CFA was to compare model fit measures on multiple models to find the model with the best fit before moving to the Structural Equation Modeling (SEM). IBM SPSS Statistics 21, IBM AMOS 21, and the Microsoft Excel 2018 for Office 365 were used to analyze the data.

Normality

Histograms and Shapiro-Wilk tests were examined to assess normality. According to Finney and DiStefano (2013), skew and kurtosis of each item was acceptable for the Maximum Likelihood method of SEM if skewness $< |2|$ and kurtosis < 7 (Finney & DiStefano, 2006). All items had acceptable skewness $< |2|$ and kurtosis < 7 , except weekly play time (Appendix E). Weekly play time was positively skewed since most players play for a short amount of time (minimum of 1 hours per week; $M = 10.89$, $SD = 11.81$), but there are some who play up to 70 hours per week. Negative skew was expected for items in the satisfaction scales because this research focused on people who have played a game for at least 10 hours and may be satisfied with their experience. Since the GUESS measures satisfaction, it was expected that GUESS items were negatively skewed as well. Surprisingly, none of the items nor the overall score of the GUESS had extreme issues with skewness or kurtosis. Given that this study was exploratory, all data were left untransformed to retain the interpretability of the findings.

Missing Data

“N/A” responses to the GUESS were treated as missing data, which is the same as the procedure used by Phan, Keebler, and Chaparro (2016). In total, 0.81% of the data was missing.

The percent of missing values for each item ranges from 0.3% to 5.9%. Little’s MCAR test was used to test the hypothesis that the data was missing completely at random. The test suggested that the data was not missing completely at random for the GUESS, $\chi^2 (1969) = 2470.51, p < .001$, and motive fulfillment, $\chi^2 (450) = 507.93, p = .03$, measures. Missing data was considered inconsequential because less than 1% of the data from the GUESS was missing and approximately 2.5% of the data from motive fulfillment was missing. The Multiple Imputation method in SPSS was used to replace missing data values before analyzing the CFA.

Model Fit Assessment

Overall fit of the model was assessed using fit indices, including Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), and Comparative Fit Index (CFI). Table 9 below provides a summary of the recommended for model fit (Hu & Bentler, 1999).

Table 9

Recommendations for Model Fit

Statistic	Threshold for Fit
<i>p</i> -value for the model	> .05
CFI	> .95
SRMR	< .08
RMSEA	< .06

Hypothesized Measurement Model Assessment

A CFA was conducted on the hypothesized measurement model, which included the following unobserved latent factors: Motives included constructs for Socializer (3 items), Completionist (3 items), Competitor (3 items), Escapist (2 items), Story driven (2 items), and Smarty-pants (2 items) motives. Fulfillment of motives included constructs for Socializer (3 items), Completionist (3 items), Competitor (3 items), Escapist (2 items), Story driven (2 items),

and Smarty-pants (2 items) fulfillment. GUESS included constructs for Usability/Playability (11 items), Narratives (7 items), Play Engrossment (8 items), Enjoyment (5 items), Creative Freedom (7 items), Audio Aesthetics (4 items), Personal Gratification (6 items), Social Connectivity (4 items), and Visual Aesthetics (3 items). Continuance Intentions included 4 items.

All latent factors were covaried with each other during the CFA of the hypothesized measurement model. Results suggested that the hypothesized measurement model was not adequate in terms of model fit. The chi-square statistic, $\chi^2(3596) = 7048.48, p < .001$, was significant, indicating a lack of fit. However, large sample sizes tend to inflate the p -value of the chi-square test (Hooper, Coughlan, & Mullen, 2008; Kenny, 2012). The RMSEA value (0.05) and SRMR (0.07) were within acceptable ranges. However, the CFI = .81 was less than .95, which suggested that the model had poor fit.

Table 10

Hypothesized Measurement Model Fit (N = 353)

Fit Index	Value
χ^2	7048.48, $p < .001$
df	3596
CFI	0.81
RMSEA (90% CI)	0.052 (0.050, 0.054)
SRMR	0.07
Hoelter's .05, .01	187, 190

Validity Assessment

All constructs in the measurement model were tested for convergent and discriminant validity. Average Variance Extracted (AVE) higher than 0.5 indicated acceptable convergent validity (Fornell & Larcker, 1981; Hair, Sarstedt, Hopkins, & G. Kuppelwieser, 2014).

Convergent validity was acceptable (AVE > .5) for 13 out of the 22 latent variables. The constructs that did not have convergent validity were the Completionist and Escapist constructs

from both the motive and fulfillment measures, and 5 out of 9 constructs from the GUESS (Usability/Playability, Play Engrossment, Creative Freedom, Personal Gratification, and Social Connectivity). Low AVE could have been due the existence of low loadings for items in each latent variable. Standardized item loadings were examined. Table 11 provides a summary of the Convergent Validity of the measurement model. Loadings less than 0.40 were considered weak and those greater than 0.70 were considered strong (Hair, Black, Babin, Anderson, & Tatham, 2006). 51% of the items had standardized loadings less than 0.70. However, there were no loadings less than 0.40. Therefore, no items were removed to improve AVE during the analysis.

Construct reliability was assessed by examining the Composite Reliability (CR) of constructs, where a value greater than 0.7 was acceptable (Hair et al., 2014). Reliability was acceptable (CR > .70) for 19 out of the 22 latent variables (Table 11). The reliability was below the acceptable criteria (CR < .7) for the Escapist construct in both the Escapist motive (CR = .66) and Escapist fulfillment (CR = .62) measures.

To investigate discriminant validity of the constructs, square root of the AVE was assessed. These values are the values on the diagonal of Table 12 below in bold font. \sqrt{AVE} values greater than the correlations between factors indicate acceptable discriminant validity. Discriminant validity was acceptable ($\sqrt{AVE} >$ Cross-factor correlations) for 12 out of 22 latent variables. Discriminant validity issues were found across all measures. In the motive and fulfillment measures, the discriminant validity issues were present in the Escapist construct for both the motive and fulfillment measures, in 7 out of 9 constructs in the GUESS (Usability/Playability, Narratives, Play Engrossment, Enjoyment, Creative Freedom, Personal Gratification, and Social Connectivity), and continuance intention.

Table 11

Convergent Validity of the Measurement Model

Construct		Cronbach's Alpha	Item		Loading	CR	AVE
<i>Motives</i>	Socializer	0.80	trojan_type_1	I like to chat with my friends while playing a video game	0.78	0.80	0.57
			trojan_type_2	I like to use voice communication when I play	0.76		
			trojan_type_3	It's important to me to play with a tightly knit group	0.73		
	Completionist	0.70	trojan_type_4	I like to master all elements of a game	0.67	0.71	0.44
			trojan_type_5	I like to figure out how the game works inside and out	0.65		
			trojan_type_6	I like to try everything that is possible to do in a game	0.68		
	Competitor	0.82	trojan_type_7	Winning is a big reason for me to play video games	0.79	0.82	0.61
			trojan_type_8	I play to win	0.79		
			trojan_type_9	It is important to me to be the fastest and most skilled person playing the game	0.76		
	Escapist	0.66	trojan_type_10	I like to do things in games which I cannot do in real life	0.72	0.66	0.50
			trojan_type_11	Video games allow me to pretend I am someone/somewhere else	0.69		
	Story driven	0.78	trojan_type_12	I like the feeling of being part of a story	0.86	0.79	0.65
			trojan_type_13	I like stories in a game	0.75		
	Smarty pants	0.72	trojan_type_14	Games make me smarter	0.69	0.72	0.57
			trojan_type_15	I play games to enhance my intellectual abilities	0.81		
<i>Fulfillment of Motive</i>	Socializer	0.77	motive_fulfill_1	How well does the game allow you to...chat with friends while playing the video game	0.82	0.79	0.56
			motive_fulfill_2	How well does the game allow you to...use voice communication when you play	0.77		
			motive_fulfill_3	How well does the game allow you to...play with a tightly knit group	0.64		
	Completionist	0.69	motive_fulfill_4	How well does the game allow you to...master all elements of the game	0.78	0.70	0.44
			motive_fulfill_5	How well does the game allow you to...figure out how the game works inside and out	0.56		
			motive_fulfill_6	How well does the game allow you to...try everything that is possible to do in the game	0.63		
	Competitor	0.78	motive_fulfill_7	How well does the game allow you to...win	0.82	0.79	0.56
			motive_fulfill_8	How well does the game allow you to...play to win	0.79		
			motive_fulfill_9	How well does the game allow you to...be the fastest and most skilled person playing the game	0.63		

Table 11 (continued)

Construct		Cronbach's Alpha	Item	Loading	CR	AVE
Escapist		0.59	motive_fulfill_10	How well does the game allow you to...do things in the game which you cannot do in real life	0.53	0.62 0.46
			motive_fulfill_11	How well does the game allow you to...pretend you are someone/somewhere else	0.80	
Story driven		0.91	motive_fulfill_12	How well does the game allow you to...be part of the story	0.92	0.91 0.83
			motive_fulfill_13	How well does the game allow you to...experience stories in the game	0.90	
Smarty pants		0.84	motive_fulfill_14	How well does the game allow you to...get smarter	0.81	0.85 0.73
			motive_fulfill_15	How well does the game allow you to...enhance your intellectual abilities	0.91	
<i>Satisfaction</i>	Usability/ Playability	0.86	Q1	I think it is easy to learn how to play the game.	0.57	0.88 0.39
			Q2	I find the controls of the game to be straightforward.	0.69	
			Q3	I always know how to achieve my goals/objectives in the game.	0.69	
			Q4	I find the game's interface to be easy to navigate.	0.72	
			Q5	I do not need to go through a lengthy tutorial or read a manual to play the game.	0.41	
			Q6	I find the game's menus to be user friendly.	0.63	
			Q7	I feel the game trains me well in all of the controls.	0.63	
			Q8	I always know my next goal when I finish an event in the game.	0.61	
			Q9	I feel the game provides me the necessary information to accomplish a goal within the game.	0.68	
			Q10	I think the information provided in the game (e.g., onscreen messages, help) is clear.	0.62	
Narratives		0.87	Q11	I feel very confident while playing the game.	0.59	
			Q12	I think the characters in the game are well developed.	0.59	0.88 0.50
			Q13	I am captivated by the game's story from the beginning.	0.84	
			Q14	I enjoy the fantasy or story provided by the game.	0.78	
			Q15	I can identify with the characters in the game.	0.61	
			Q16	I am emotionally moved by the events in the game.	0.67	

Table 11 (continued)

Construct	Cronbach's Alpha	Item	Loading	CR	AVE	
Play Engrossment	0.84	Q17	I am very interested in seeing how the events in the game will progress.	0.67	0.85	0.41
		Q18	I can clearly understand the game's story.	0.76		
		Q19	I feel detached from the outside world while playing the game.	0.64		
		Q20	I do not care to check events that are happening in the real world during the game.	0.51		
		Q21	I cannot tell that I am getting tired while playing the game.	0.61		
		Q22	Sometimes I lose track of time while playing the game.	0.66		
		Q23	I temporarily forget about my everyday worries while playing the game.	0.69		
		Q24	I tend to spend more time playing the game than I have planned.	0.67		
		Q25	I can block out most other distractions when playing the game.	0.67		
		Q26	Whenever I stopped playing the game I cannot wait to start playing it again.	0.66		
Enjoyment	0.88	Q27	I think the game is fun.	0.85	0.90	0.65
		Q28	I enjoy playing the game.	0.90		
		Q29R	I feel bored while playing the game. (REVERSE CODED)	0.52		
		Q30	I am likely to recommend this game to others.	0.84		
		Q31	If given the chance, I want to play this game again.	0.86		
Creative Freedom	0.85	Q32	I feel the game allows me to be imaginative.	0.79	0.86	0.46
		Q33	I feel creative while playing the game.	0.73		
		Q34	I feel the game gives me enough freedom to act how I want.	0.61		
		Q35	I feel the game allows me to express myself.	0.66		
		Q36	I feel I can explore things in the game.	0.70		
		Q37	I feel my curiosity is stimulated as the result of playing the game.	0.72		
		Q38	I think the game is unique or original.	0.54		
Audio Aesthetic	0.84	Q39	I enjoy the sound effects in the game.	0.79	0.85	0.59
		Q40	I enjoy the music in the game.	0.71		

Table 11 (continued)

Construct	Cronbach's Alpha	Item	Loading	CR	AVE	
Personal Gratification	0.76	Q41	I feel the game's audio (e.g., sound effects, music) enhances my gaming experience.	0.79		
		Q42	I think the game's audio fits the mood or style of the game.	0.78		
		Q43	I am in suspense about whether I will succeed in the game.	0.42	0.79	0.39
		Q44	I feel successful when I overcome the obstacles in the game.	0.66		
		Q45	I want to do as well as possible during the game.	0.66		
		Q46	I am very focused on my own performance while playing the game.	0.69		
		Q47	I feel the game constantly motivates me to proceed further to the next stage or level.	0.60		
		Q48	I find my skills gradually improve through the course of overcoming the challenges in the game.	0.66		
Social Connectivity	0.72	Q49	I find the game supports social interaction (e.g., chat) between players.	0.66	0.72	0.40
		Q50	I like to play this game with other players.	0.70		
		Q51	I am able to play the game with other players if I choose.	0.56		
Visual Aesthetic	0.84	Q52	I enjoy the social interaction within the game.	0.59		
		Q53	I enjoy the game's graphics.	0.82	0.85	0.65
		Q54	I think the graphics of the game fit the mood or style of the game.	0.76		
		Q55	I think the game is visually appealing.	0.84		
<i>Continuance Intention</i>	0.91	continue_1	In the future, I will continue to play the game	0.91	0.92	0.73
		continue_2	In the future, I will play the game often	0.87		
		continue_3	I will say advantages of the game to other people	0.74		
		continue_4	I will recommend the game to other people	0.89		

Note. Potentially inadmissible values are indicated in red text.

Table 12

Discriminant Validity of the Measurement Model

		CR	AVE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
<i>Motives</i>	1. Socializer	0.80	0.57	0.76																					
	2. Completionist	0.71	0.45	0.48	0.67																				
	3. Competitor	0.82	0.61	0.42	0.51	0.78																			
	4. Escapist	0.66	0.50	0.37	0.64	0.13	0.71																		
	5. Story driven	0.79	0.65	0.27	0.55	-0.03	0.75	0.81																	
	6. Smarty pants	0.72	0.57	0.38	0.59	0.26	0.45	0.37	0.75																
<i>Fulfillment of Motive</i>	7. Socializer	0.79	0.56	0.55	0.20	0.17	0.20	0.19	0.18	0.75															
	8. Completionist	0.70	0.44	0.26	0.49	0.40	0.26	0.21	0.42	0.44	0.66														
	9. Competitor	0.79	0.56	0.32	0.35	0.46	0.13	0.17	0.19	0.33	0.62	0.75													
	10. Escapist	0.62	0.46	0.04	0.26	0.10	0.47	0.27	0.27	0.43	0.53	0.14	0.68												
	11. Story driven	0.91	0.83	-0.10	0.10	0.10	0.16	0.05	0.19	0.13	0.39	-0.04	0.70	0.91											
	12. Smarty pants	0.85	0.73	0.13	0.25	0.20	0.24	0.16	0.68	0.18	0.53	0.20	0.36	0.40	0.86										
<i>Satisfaction</i>	13. Usability/ Playability	0.88	0.39	0.30	0.47	0.23	0.43	0.43	0.31	0.35	0.56	0.38	0.27	0.15	0.25	0.63									
	14. Narratives	0.88	0.50	0.13	0.32	0.17	0.38	0.29	0.34	0.22	0.39	0.07	0.60	0.73	0.43	0.53	0.71								
	15. Play Engrossment	0.85	0.41	0.24	0.36	0.21	0.36	0.22	0.26	0.27	0.42	0.25	0.44	0.27	0.34	0.52	0.62	0.64							
	16. Enjoyment	0.90	0.65	0.24	0.36	0.16	0.28	0.31	0.22	0.26	0.44	0.35	0.26	0.19	0.24	0.65	0.59	0.65	0.81						
	17. Creative Freedom	0.86	0.46	0.19	0.31	0.22	0.33	0.27	0.42	0.15	0.46	0.05	0.61	0.67	0.55	0.50	0.90	0.61	0.56	0.68					
	18. Audio Aesthetic	0.85	0.59	0.23	0.28	0.02	0.28	0.46	0.17	0.29	0.26	0.22	0.24	0.12	0.21	0.53	0.48	0.39	0.50	0.45	0.77				

Table 12 (continued)

	CR	AVE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
19. Personal Gratification	0.79	0.39	0.33	0.45	0.39	0.40	0.37	0.28	0.32	0.54	0.48	0.34	0.13	0.31	0.81	0.56	0.69	0.77	0.57	0.56	0.62				
20. Social Connectivity	0.72	0.40	0.69	0.38	0.16	0.38	0.38	0.29	0.68	0.37	0.30	0.26	0.07	0.19	0.62	0.40	0.47	0.57	0.39	0.55	0.63	0.63			
21. Visual Aesthetic	0.85	0.65	0.17	0.30	0.10	0.25	0.36	0.09	0.29	0.29	0.22	0.24	0.12	0.10	0.70	0.51	0.53	0.72	0.49	0.76	0.76	0.59	0.80		
<i>Continuance Intention</i> 22. Continuance Intention	0.92	0.73	0.25	0.36	0.17	0.25	0.25	0.30	0.26	0.45	0.34	0.28	0.21	0.33	0.63	0.59	0.65	0.93	0.57	0.48	0.70	0.47	0.60	0.86	

Note. Potentially inadmissible values are indicated in red text. Square root of the AVE are reported in bold on the diagonal.

Overall, the measures in this study exhibited issues with convergent validity and discriminant validity. Convergent validity issues may have been due to items with low loadings, which could result in a low AVE. Discriminant validity issues may have been caused by highly correlated latent constructs, which could lead to a lower \sqrt{AVE} compared to construct correlations. Given the validity issues, the interpretations of the structural equation model may not be acceptable. However, the hypothesized structural model was assessed below to determine how hypotheses would have been expressed in this model.

Structural Model Evaluation and Hypothesis Testing

The hypothesized model is shown in Figure 7.

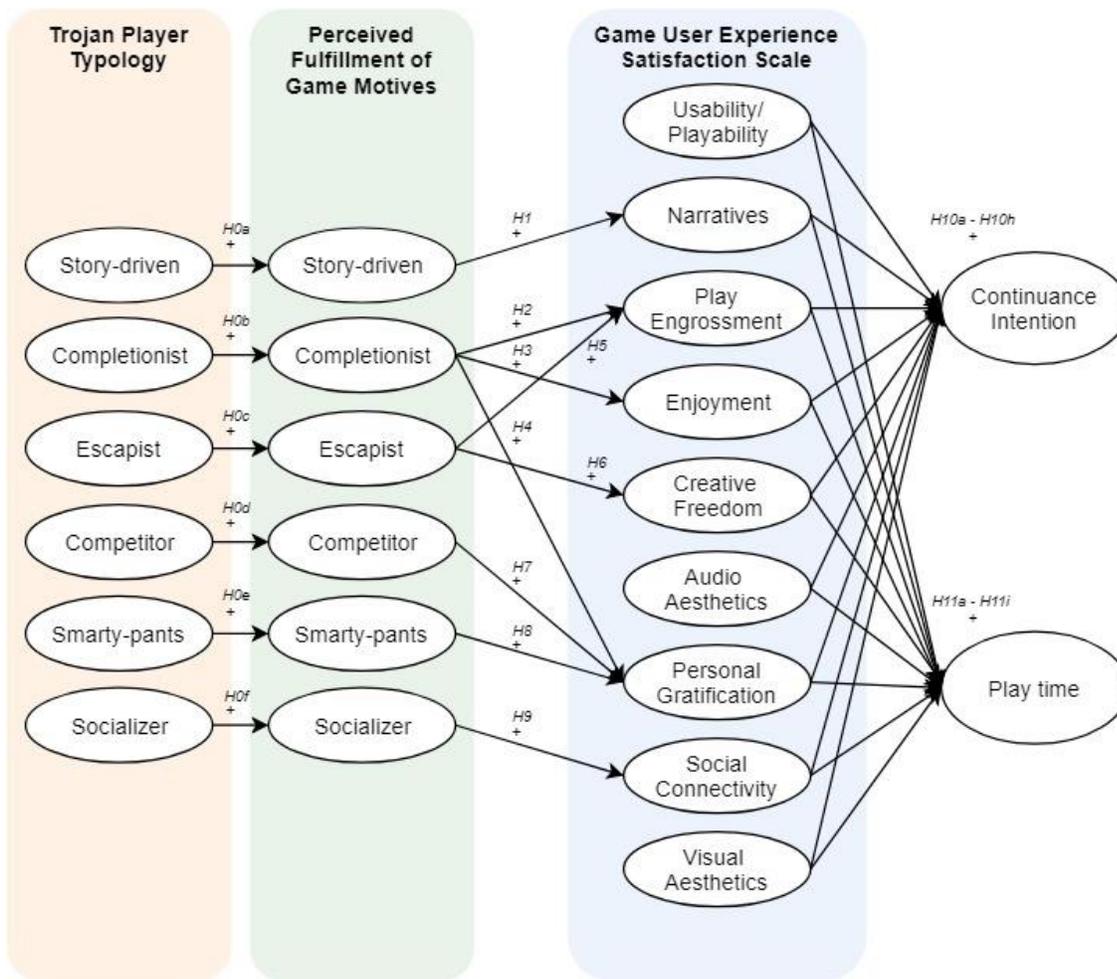


Figure 7. Hypothesized model.

The structural model of the hypothesized model was tested using the fully latent SEM. Table 12 summarizes the results of the hypothesized SEM. Multicollinearity was assessed using the variance inflation factor (VIF), where a $VIF > 5$ indicates an issue with multicollinearity (Craney & Surles, 2002). There were issues with multicollinearity in 8 out of 33 of the hypotheses tested. The variables that had a $VIF > 10$ were Narratives, Creative Freedom, and Personal Gratification. These variables exhibited extreme collinearity when predicting both continuance intention and weekly play time. Evidence of multicollinearity suggested that the variables are highly related to one another, which means that interpretation of the final relationships may be influenced by the shared variance.

The R^2 values indicated that the hypothesized model explained 88% of the variance in continuance intention and 15% of the variance in weekly play time. All the predicted relationships between fulfillment of motives and GUESS constructs showed that the fulfillment measures were explaining a large amount of variance in the GUESS. Specifically, the hypothesized model explained 54% of the variance in Narratives, 56% in Play Engrossment, 64% in Enjoyment, 44% in Creative Freedom, 82% in Personal Gratification, and 56% in Social Connectivity. However, some of the variables in the fulfillment of motives measures had relatively lower R^2 values. Specifically, the hypothesized model only explained 2% of the variance in Story driven motive fulfillment, and moderately explained 23% of the variance in Competitor motive fulfillment. The other fulfillment measures have high R^2 values. The hypothesized model explained 37% of the variance in Completionist motive fulfillment, 26% in Escapist motive fulfillment, 45% in Smarty-pants motive fulfillment, and 37% in Socializer motive fulfillment. However, it should be noted that the R^2 values could have been influenced by the multicollinearity in these data.

The results indicated that all the motive constructs were positively related to their corresponding fulfillment construct (H0a–H0f were supported), as predicted. Further, most of the fulfillment of motives constructs were positively related to their predicted GUESS constructs (H1–H7, and H9 were supported). Interestingly, Smarty-pants motive fulfillment did not have a significant relationship with Personal Gratification (H8 was not supported). Several of the GUESS constructs were positively related to continuance intention, including Usability/Playability, Play Engrossment, Enjoyment, and Audio Aesthetics. H10a, H10c, H10d, and H10f were supported. Contrary to what was hypothesized, Visual Aesthetics had a significant negative relationship with continuance intention (H10i was not supported). Narratives, Creative Freedom, Personal Gratification, and Social Connectivity did not have a significant relationship with continuance intention (H10b, H10e, H10g, and H10h were not supported). Play Engrossment was the only GUESS construct that was positively related to weekly play time (H11c was supported). None of the other GUESS constructs had a significant relationship with weekly play time (H11a–H11b and H11d–H11i were not supported). Figure 8 shows the standardized path coefficients and R^2 of the constructs in the hypothesized structural model.

Table 13

Results of the Hypothesized Structural Equation Model Analysis

Hypothesis	Relationship	Std β	SE	<i>t</i> -value	<i>p</i> -value	Decision	R^2	VIF
H0a	Story-driven motives → Story-driven fulfillment	0.13	0.11	2.09	***	Supported	0.02	1.00
H0b	Completionist motives → Completionist fulfillment	0.61	0.08	6.56	***	Supported	0.37	1.00
H0c	Escapist motives → Escapist fulfillment	0.51	0.06	5.37	***	Supported	0.26	1.00
H0d	Competitor motives → Competitor fulfillment	0.48	0.06	7.24	***	Supported	0.23	1.00
H0e	Smarty-pants motives → Smarty-pants fulfillment	0.67	0.09	8.89	***	Supported	0.45	1.00
H0f	Socializer motives → Socializer fulfillment	0.61	0.07	8.79	***	Supported	0.37	1.00
H1	Story-driven fulfillment → Narratives	0.74	0.05	9.16	***	Supported	0.54	1.00
H2	Completionist fulfillment → Play Engrossment	0.66	0.17	6.97	***	Supported	0.56	1.58
H3	Completionist fulfillment → Enjoyment	0.80	0.15	8.55	***	Supported	0.64	1.00
H4	Completionist fulfillment → Personal Gratification	0.90	0.17	5.82	***	Supported	0.82	3.13
H5	Escapist fulfillment → Play Engrossment	0.24	0.12	3.77	***	Supported		1.58
H6	Escapist fulfillment → Creative Freedom	0.66	0.24	6.71	***	Supported	0.44	1.00
H7	Competitor fulfillment → Personal Gratification	0.10	0.04	2.08	***	Supported		2.13
H8	Smarty-pants fulfillment → Personal Gratification	-0.05	0.03	-1.05	0.29	Not Supported		1.72
H9	Socializer fulfillment → Social Connectivity	0.75	0.08	10.03	***	Supported	0.56	1.00
H10a	Usability/Playability → Continuance Intention	0.10	0.05	3.42	***	Supported	0.88	4.95
H10b	Narratives → Continuance Intention	0.02	0.05	0.64	0.52	Not Supported		11.38
H10c	Play Engrossment → Continuance Intention	0.11	0.06	2.41	***	Supported		3.35
H10d	Enjoyment → Continuance Intention	0.93	0.09	15.43	***	Supported		3.97
H10e	Creative Freedom → Continuance Intention	0.04	0.03	1.43	0.15	Not Supported		10.54
H10f	Audio Aesthetics → Continuance Intention	0.08	0.04	2.59	***	Supported		3.82
H10g	Personal Gratification → Continuance Intention	-0.11	0.13	-1.80	0.07	Not Supported		10.06
H10h	Social Connectivity → Continuance Intention	-0.06	0.04	-1.95	0.05	Not Supported		2.35
H10i	Visual Aesthetics → Continuance Intention	-0.12	0.05	-3.97	***	Not Supported		6.86
H11a	Usability/Playability → Play Time	0.04	0.73	0.67	0.51	Not Supported		4.95
H11b	Narratives → Play Time	0.00	0.91	0.04	0.97	Not Supported		11.38
H11c	Play Engrossment → Play Time	0.34	1.05	3.93	***	Supported	0.15	3.35
H11d	Enjoyment → Play Time	-0.16	1.13	-1.85	0.06	Not Supported		3.97
H11e	Creative Freedom → Play Time	0.02	0.55	0.31	0.76	Not Supported		10.54
H11f	Audio Aesthetics → Play Time	-0.02	0.67	-0.37	0.71	Not Supported		3.82
H11g	Personal Gratification → Play Time	0.14	2.04	1.40	0.16	Not Supported		10.06
H11h	Social Connectivity → Play Time	0.07	0.69	1.30	0.20	Not Supported		2.35
H11i	Visual Aesthetics → Play Time	-0.05	0.76	-1.00	0.32	Not Supported		6.86

*** $p < .05$

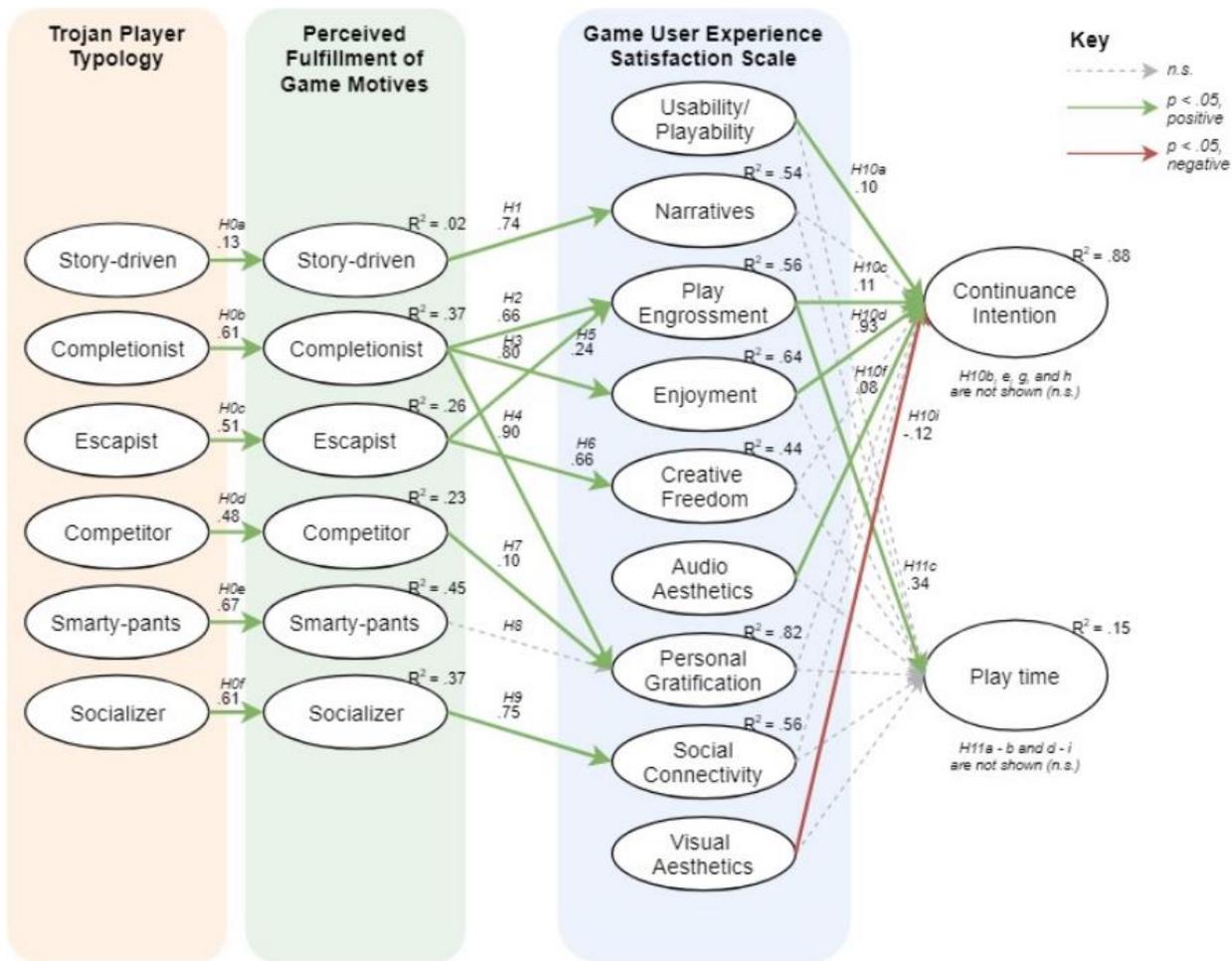


Figure 8. Results of the hypothesized structural equation model.

The fit indices of the hypothesized SEM were poor, with a low CFI (CFI = .70), a high RMSEA (RMSEA=0.063), and high SRMR (0.19). Table 14 provides a summary.

Table 14

Hypothesized SEM Fit (N = 353)

Fit Index	Value
χ^2	9295.10, $p < .001$
df	3868
CFI	0.70
RMSEA (90% CI)	0.063 (0.061, 0.065)
SRMR	0.19
Hoelter's .05, .01	153, 155

The hypothesized model had issues with discriminant validity, multicollinearity, and poor model fit. A set of exploratory analyses were conducted to identify a theoretically acceptable model with discriminant validity.

Exploratory Analyses

Alternate Model 1: Validity Adjusted Model

The hypothesized model had issues with discriminant validity, multicollinearity, and poor model fit. To improve discriminant validity, a series of factor analyses were conducted to iteratively check the pattern matrix between two interrelated factors when the factor analysis was constrained to a two-factor solution. Throughout the process, the items with the highest cross-loadings were removed one at a time and the CFA was rerun to retest for discriminant validity. This process was repeated until the construct had acceptable discriminant validity while maintaining reliability.

The iterative cross-loading item removal process fixed validity issues in most of the GUESS and continuance intention constructs. However, some constructs still had discriminant validity issues that were unable to be fixed by removing items. In the GUESS, the Social Connectivity and Personal Gratification constructs were removed from the model to eliminate the remaining constructs with poor discriminant validity. There were also validity issues with the Escapist constructs in both the motives and fulfillment of motives measures. The Escapist constructs were highly correlated with the Story driven measures ($r = .75$ for motives, $r = .70$ for fulfillment). There was no way to adjust the items to improve discriminant validity by removing items because both Escapist and Story driven constructs only had two items. The discriminant validity issues were resolved by removing the Escapist construct from the measurement model. Table 15 provides a summary of the discriminant validity for the validity adjusted model.

Table 15

Discriminant Validity of the Validity Adjusted Model

		CR	AVE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
<i>Motives</i>	1. Socializer	0.80	0.57	0.76																			
	2. Completionist	0.71	0.45	0.47	0.67																		
	3. Competitor	0.82	0.61	0.42	0.50	0.78																	
	4. Story driven	0.78	0.65	0.27	0.56	-0.07	0.80																
	5. Smarty-pants	0.72	0.57	0.38	0.59	0.26	0.36	0.75															
<i>Fulfillment of Motive</i>	6. Socializer	0.79	0.56	0.54	0.19	0.17	0.19	0.17	0.75														
	7. Completionist	0.70	0.44	0.26	0.49	0.40	0.19	0.42	0.43	0.66													
	8. Competitor	0.79	0.56	0.32	0.35	0.46	0.17	0.19	0.31	0.62	0.75												
	9. Story driven	0.91	0.83	-0.10	0.10	0.10	0.02	0.20	0.13	0.39	-0.03	0.91											
	10. Smarty-pants	0.85	0.74	0.12	0.25	0.20	0.14	0.68	0.17	0.53	0.20	0.40	0.86										
<i>Satisfaction</i>	11. Usability/ Playability	0.73	0.40	0.18	0.37	0.14	0.31	0.30	0.30	0.49	0.25	0.24	0.19	0.64									
	12. Narratives	0.86	0.62	0.08	0.24	0.16	0.24	0.30	0.17	0.33	0.04	0.76	0.40	0.51	0.78								
	13. Play Engrossment	0.79	0.43	0.23	0.34	0.23	0.16	0.24	0.23	0.39	0.25	0.24	0.31	0.37	0.51	0.66							
	14. Enjoyment	0.90	0.82	0.24	0.35	0.17	0.32	0.20	0.21	0.43	0.35	0.20	0.21	0.52	0.53	0.60	0.90						
	15. Creative Freedom	0.80	0.58	0.18	0.28	0.20	0.22	0.39	0.08	0.43	0.03	0.55	0.51	0.36	0.71	0.48	0.48	0.76					
	16. Audio Aesthetic	0.85	0.59	0.24	0.28	0.02	0.47	0.17	0.29	0.26	0.22	0.12	0.21	0.43	0.41	0.33	0.49	0.47	0.77				
	17. Visual Aesthetic	0.83	0.71	0.16	0.28	0.10	0.35	0.09	0.27	0.29	0.20	0.15	0.11	0.61	0.46	0.48	0.70	0.47	0.71	0.84			
<i>Continuance Intention</i>	18. Continuance Intention	0.89	0.72	0.25	0.36	0.15	0.24	0.28	0.23	0.44	0.34	0.18	0.31	0.49	0.48	0.61	0.83	0.49	0.45	0.56	0.85		

Note. Square root of the AVE are reported in bold on the diagonal.

The validity adjusted measurement model fixed all discriminant validity and reliability issues that existed in the hypothesized measurement model and improved fit, χ^2 difference = 4978.74, $df = 2424$, $p < .001$. However, the validity adjusted measurement model did not meet all fit statistics, $\chi^2 (1172) = 2069.74$, $p < .001$, and had a CFI $< .95$ (CFI = .91, RMSEA = .05, SRMR = .05). Table 16 provides a summary.

Table 16
Validity Adjusted Measurement Model Fit (N = 353)

Fit Index	Value
χ^2	2069.74, $p < .001$
df	1172
CFI	0.91
RMSEA (90% CI)	0.047 (0.043, 0.050)
SRMR	0.05
Hoelter's .05, .01	214, 219

While this model had better fit than the hypothesized measurement model, it imposed several limitations. One limitation was that by reducing the number of items for each construct in the GUESS, the overall scale could have moving further away from the scale that was validated by Phan, Keebler, and Chaparro (2016). Another limitation with this model was that removing GUESS constructs (i.e., Social Connectivity and Personal Gratification) limited the interpretations that could have been made between motive fulfillment and GUESS constructs. Specifically, many of the originally hypothesized relationships were no longer able to be tested because Social Connectivity and Personal Gratification were removed from the model (i.e., H4, H7—H9, H10g—H10h, and H11g—H11h).

Results of the validity adjusted measurement model suggested that the discriminant validity issues could not be fixed while retaining the usefulness of the GUESS as a measure of game satisfaction. To account for these issues, a second model was developed and tested that

used a composite score of the GUESS (i.e., Overall GUESS) as a replacement for each GUESS construct in the model.

Alternate Model 2: Composite GUESS Model

A second model was developed and tested that used a composite score of the GUESS (i.e., Overall GUESS) as a replacement for each GUESS construct in the model. The reliability of the entire 55-item GUESS scale was high (Cronbach’s alpha =.96). An overall Game User Experience Satisfaction Scale score was calculated by averaging participant ratings across a GUESS construct and then summing all the construct scores for an overall score that could range from 9 to 63 (Phan, Keebler, & Chaparro, 2016). The composite GUESS measurement model did not meet all fit statistics, $\chi^2(448) = 903.86, p < .001$, and had a CFI < .95 (CFI = .92, RMSEA = .05, SRMR = .05). Table 17 provides fit statistics for the composite GUESS measurement model.

Table 17

Composite GUESS Measurement Model Fit (N = 353)

Fit Index	Value
χ^2	903.86, $p < .001$
df	448
CFI	0.92
RMSEA (90% CI)	0.054 (0.049, 0.059)
SRMR	0.05
Hoelter’s .05, .01	195, 203

Discriminant validity was lacking ($\sqrt{AVE} > \text{Cross-factor correlations}$) for the Escapist construct in both the motives and fulfillment of motives measures. The issue was due to a high correlation between the Escapist and Story-driven constructs in the motive and fulfillment of motive measures. Table 18 provides a summary of the discriminant validity of the composite GUESS measurement model. It should be noted that none of the GUESS constructs were

analyzed in the table because the measurement model no longer used GUESS survey items to reflect onto a latent variable. Instead, a GUESS overall score variable was added to the model during the structural modeling step.

Table 18

Discriminant Validity of the Composite GUESS Measurement Model

		CR	AVE	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Motives</i>	1. Socializer	0.80	0.57	0.76												
	2. Completionist	0.71	0.44	0.48	0.67											
	3. Competitor	0.82	0.61	0.42	0.51	0.78										
	4. Escapist	0.66	0.50	0.37	0.64	0.13	0.71									
	5. Story driven	0.79	0.66	0.27	0.54	-0.02	0.74	0.81								
	6. Smarty pants	0.72	0.57	0.38	0.60	0.26	0.45	0.36	0.75							
<i>Fulfillment of Motive</i>	7. Socializer	0.79	0.56	0.54	0.20	0.17	0.19	0.18	0.19	0.75						
	8. Completionist	0.70	0.44	0.26	0.49	0.40	0.26	0.22	0.43	0.44	0.66					
	9. Competitor	0.79	0.56	0.32	0.35	0.46	0.14	0.17	0.19	0.32	0.62	0.75				
	10. Escapist	0.61	0.45	0.04	0.26	0.10	0.48	0.29	0.27	0.44	0.54	0.15	0.67			
	11. Story driven	0.91	0.83	-0.11	0.09	0.10	0.15	0.06	0.19	0.13	0.38	-0.04	0.70	0.91		
	12. Smarty pants	0.85	0.73	0.12	0.26	0.20	0.23	0.17	0.68	0.17	0.53	0.20	0.36	0.39	0.86	
<i>Continuance Intention</i>	13. Continuance Intention	0.91	0.72	0.24	0.36	0.15	0.24	0.23	0.29	0.24	0.45	0.35	0.25	0.19	0.32	0.85

Note. Potentially inadmissible values are indicated in red text. Square root of the AVE are reported in bold on the diagonal.

To eliminate discriminate validity issues, the Escapists constructs for motives and fulfillment of motives were removed from the model. The final discriminant validity without the Escapist constructs is shown in Table 19 below.

Table 19

Discriminant Validity of the Composite GUESS (no Escapist) Measurement Model

		CR	AVE	1	2	3	4	5	6	7	8	9	10	11
<i>Motives</i>	1. Socializer	0.80	0.57	0.76										
	2. Completionist	0.71	0.45	0.47	0.67									
	3. Competitor	0.82	0.60	0.42	0.50	0.78								
	4. Story driven	0.78	0.65	0.27	0.56	-0.07	0.80							
	5. Smarty pants	0.72	0.57	0.38	0.59	0.26	0.36	0.75						
<i>Fulfillment of Motive</i>	6. Socializer	0.79	0.56	0.54	0.19	0.17	0.19	0.18	0.75					
	7. Completionist	0.70	0.44	0.26	0.49	0.40	0.19	0.43	0.43	0.66				
	8. Competitor	0.79	0.56	0.32	0.35	0.46	0.17	0.19	0.31	0.62	0.75			
	9. Story driven	0.91	0.83	-0.09	0.10	0.10	0.02	0.21	0.12	0.40	-0.01	0.91		
	10. Smarty pants	0.85	0.73	0.12	0.25	0.20	0.14	0.68	0.17	0.53	0.20	0.40	0.86	
<i>Continuance Intention</i>	11. Continuance Intention	0.91	0.72	0.24	0.36	0.15	0.24	0.29	0.24	0.45	0.35	0.21	0.32	0.85

Note. Square root of the AVE are reported in bold on the diagonal.

The composite GUESS measurement model without the Escapist constructs fit better than the model with Escapist measures, χ^2 difference = 1394.30, $df = 823$, $p < .001$. However, the composite GUESS measurement model without the Escapist constructs did not meet all fit criteria, $\chi^2(349) = 675.44$, $p < .001$, and had a CFI < .95 (CFI = .94, RMSEA = .05, SRMR = .05). Table 20 provides fit statistics for the composite GUESS measurement model without Escapist constructs.

Table 20

Composite GUESS (Escapist removed) Measurement Model Fit (N = 353)

Fit Index	Value
χ^2	675.44, $p < .001$
df	349
CFI	0.94
RMSEA (90% CI)	.052 (.046, .057)
SRMR	0.05
Hoelter's .05, .01	206, 216

After achieving acceptable discriminant validity, a test for common method bias was performed. Common method bias was tested by adding a common latent factor and comparing the unconstrained measurement model ($\chi^2 = 531.18$, $df = 319$, $p < .001$) to the fully constrained model ($\chi^2 = 675.44$, $df = 349$, $p < .001$). The χ^2 difference test showed evidence of common method bias (χ^2 difference = 144.26, $df = 30$, $p < .001$). To account for common method bias, the factor scores were imputed with the unconstrained common latent factor in the model before structural equation modeling.

The SEM for the composite GUESS model without the Escapist constructs had poor fit, $\chi^2 (56) = 1006.51$, $p < .001$ (CFI = .58, RMSEA = .22, SRMR = .13). Modification indices were assessed to try to improve model fit, but adjustments based on the modification indices did not improve the model fit. To improve fit of the structural model, a parsimonious structural model was tested.

Alternate Model 3: Parsimonious model

A parsimonious model was tested without the fulfillment measures and the Escapist construct. The fulfillment measures were removed because they were adapted from the original Trojan Player Typology scale to determine the extent to which a game fulfills each motive. However, the goal of this research was to understand how game play motives, satisfaction, and continuance intentions were related. Although the fulfillment measure provided interesting data on what the game is affording the player, it could have added unnecessary complexity to the model since it did not measure game play motives. Since the fulfillment of motive measures were directly derived from the motive measures, participants saw similar item wordings while taking the survey. It was possible that including both the motive measures and fulfillment measures would increase the amount of error in the analyses and reduce the model fit due to the

complexity of the model. Thus, the fulfillment measures were removed from the analysis of the parsimonious model.

The parsimonious measurement model had acceptable fit, $\chi^2 (103) = 198.29, p < .001$ (CFI = .97, RMSEA = .05, SRMR = .05) and acceptable discriminant validity (See Table 22).

Table 21

Parsimonious Measurement Model Fit (N = 353)

Fit Index	Value
χ^2	198.29, $p < .001$
df	103
CFI	0.97
RMSEA (90% CI)	.051 (.040, .062)
SRMR	0.05
Hoelter's .05, .01	227, 248

Table 22

Discriminant Validity of the Parsimonious Measurement Model

		CR	AVE	1	2	3	4	5	6
<i>Motives</i>	1. Socializer	0.80	0.57	0.76					
	2. Completionist	0.71	0.45	0.47	0.67				
	3. Competitor	0.82	0.60	0.42	0.50	0.78			
	4. Story driven	0.78	0.65	0.27	0.56	-0.07	0.80		
	5. Smarty pants	0.72	0.57	0.38	0.60	0.26	0.36	0.75	
<i>Continuance Intention</i>	6. Continuance Intention	0.91	0.71	0.24	0.36	0.15	0.24	0.28	0.85

Note. Square root of the AVE are reported in bold on the diagonal.

Common method bias was tested by adding common latent factor and comparing the unconstrained measurement model ($\chi^2 = 116.52, df = 86, p = .02$) to the fully constrained model ($\chi^2 = 198.29, df = 103, p < .001$). The χ^2 difference test showed evidence of common method bias (χ^2 difference = 81.77, $df = 17, p < .001$). To account for common method bias, the factor scores were imputed with the unconstrained common latent factor in the model before structural equation modeling.

The parsimonious structural model fit well, $\chi^2(11) = 19.27, p = .06$ (CFI = .99, RMSEA = .05, SRMR = .03) and was an improvement from the SEM for the composite GUESS without the Escapist constructs, χ^2 difference = 987.24, $df = 45, p < .001$.

Table 23

Final Parsimonious SEM Fit (N = 353)

Fit Index	Value
χ^2	19.27, $p = .06$
df	11
CFI	0.99
RMSEA (90% CI)	.046 (.000, .080)
SRMR	0.03
Hoelter's .05, .01	360, 452

Multicollinearity was assessed using the variance inflation factor (VIF), where a $VIF > 5$ in the parsimonious model indicates an issue with multicollinearity (Craney & Surles, 2002). There were no issues with multicollinearity in the structural model because all VIF values were less than 5. See Table 24 below.

The R^2 values indicated that the final parsimonious SEM explained 20% of the variance in overall GUESS scores, 47% of the variance in continuance intention, and 8% of the variance in weekly play time. Standardized direct, indirect, and total effects are displayed in Appendix H.

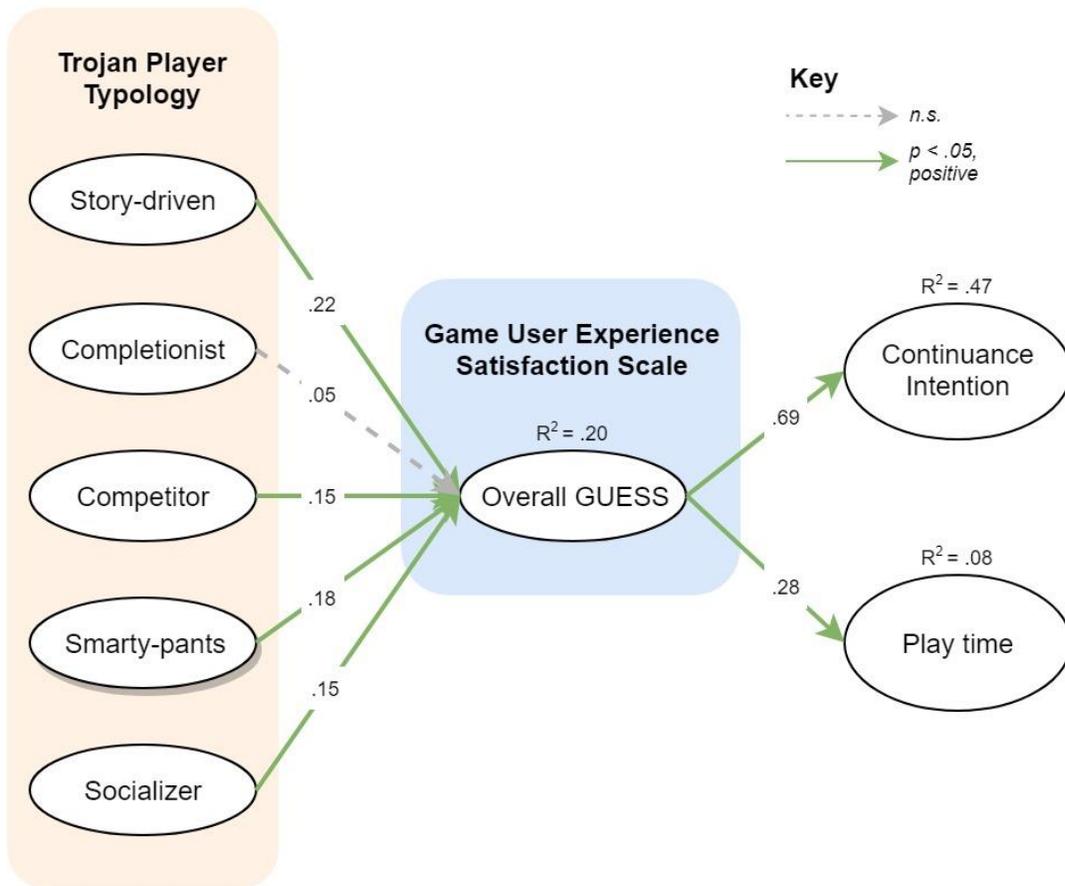


Figure 9. Final parsimonious structural equation model.

The results indicated that game play motives, including Story-driven, Competitor, Smarty-pants, and Socializer, were positively related to overall GUESS scores. Interestingly, there was no significant relationship ($p < .05$) between Completionist and overall GUESS score. Further, overall GUESS scores were positively related to continuance intention and weekly play time. A post-hoc power analysis was conducted to determine if the model had enough power to detect significant effects. The post-hoc power analysis suggested that this model had enough statistical power to detect all significant effects that were tested. The power analysis provided confidence that the effect between the Completionist construct and overall GUESS score was not significant in the context of this study, and not due to a lack of power. Refer to Table 24 to examine the results of the final SEM analysis.

Table 24

Results of the Parsimonious Structural Equation Model Analysis

Relationship	Std β	SE	<i>t</i> -value	<i>p</i> -value	<i>R</i> ²	VIF
Story-driven → GUESS Overall	0.22	0.68	2.94	***	0.20	2.56
Completionist → GUESS Overall	0.05	0.77	0.61	0.54		2.86
Competitor → GUESS Overall	0.15	0.82	2.56	***		1.50
Smarty-pants → GUESS Overall	0.18	0.63	2.94	***		1.64
Socializer → GUESS Overall	0.15	0.62	2.93	***		1.19
GUESS Overall → Continuance Intention	0.69	0.01	17.79	***	0.47	1.00
GUESS Overall → Play Time	0.28	0.09	5.41	***	0.08	1.00

****p* < .05

CHAPTER 4

DISCUSSION

Model Building and Testing

Hypothesized Measurement Model

This paper presents and tests a theoretical framework to explore the relationships between gameplay motives, fulfillment, satisfaction, continuance intention and gameplay. The initially hypothesized model was not adequate in terms of model fit (low CFI), convergent validity (i.e., some items had low factor loadings leading to low AVE), and discriminant validity issues (e.g., GUESS subscales were highly correlated, leading to lower squared AVE compared to factor correlations). A CFA was used to assess hypothesized measurement model fit. Overall, the measures in this study exhibited issues with convergent validity and discriminant validity. Convergent validity issues may have been due to items with low loadings, which could result in a low average variance extracted (AVE). Discriminant validity issues may have been caused by highly correlated latent constructs, which could have led to a lower \sqrt{AVE} compared to construct correlations.

Discriminant validity issues were found across all measures. Seven out of 9 constructs in the GUESS had issues with discriminant validity. This makes sense because while each GUESS construct can stand on its own in terms of being a construct with acceptable reliability, each make up an overall GUESS score that represents a player's satisfaction with a game. If GUESS represents an overall measure of game user experience satisfaction, it makes sense that the constructs that it consists of would explain similar variance.

The Escapist construct for both motive and fulfillment of motive measures exhibited issues with discriminant validity because it had a very high correlation with the Story driven

construct in both cases. The correlation between Escapist and Story driven was $r = .75$ for motives and $r = .70$ for fulfillment of motives. Kahn et al (2015) did not report cross-factor correlations between Escapist and Story Driven. The constructs seem to be distinct conceptually and defined correctly by examining their items in Table 11. Conceptually, it is possible that players who want to escape from real life may want to do that by experiencing the story. Thus, players could rate these two constructs similarly.

The continuance intention construct lacked discriminant validity because it had a high correlation ($r = .93$) with the Enjoyment construct in the GUESS. Given the validity issues, the interpretations of the structural equation model were not be acceptable.

Hypothesized SEM

The hypothesized structural model was tested despite the validity issues. Overall, the fit of the hypothesized model was poor, and multicollinearity was an issue in over half of the hypotheses tested. It makes sense that multicollinearity was an issue given the high correlations found between factors during the CFA. It did not make sense to interpret R^2 or standardized path coefficients based on the hypothesized model because it lacked validity, model fit, and had issues with multicollinearity. As a result, a set of exploratory analyses were conducted to identify a theoretically acceptable model with discriminant validity.

Validity Adjusted Model

The first exploratory model was an attempt to fix the issues in the model by diagnosing and removing items and constructs that were contributing to validity issues. The iterative exploratory factor analyses (EFA) approach improved validity and measurement model fit, but ultimately created several limitations for the model. One limitation was that by reducing the number of items for each construct in the GUESS, the overall scale could have moved further

away from the scale that was validated by Phan, Keebler, and Chaparro (2016). Another limitation with this model was that removing GUESS constructs (i.e., Social Connectivity and Personal Gratification) limited the interpretations that could have been made between motive fulfillment and GUESS constructs. Specifically, many of the originally hypothesized relationships were no longer able to be tested because Social Connectivity and Personal Gratification were removed from the model (i.e., H4, H7—H9, H10g—H10h, and H11g—H11h). Results of the validity adjusted measurement model suggested that the discriminant validity issues could not be fixed while retaining the usefulness of the GUESS as a measure of game satisfaction. To account for these issues, a second model was developed and tested that used a composite score of the GUESS (i.e., Overall GUESS) as a replacement for all GUESS constructs in the model.

Composite GUESS Model

The second exploratory model took advantage of the idea that all GUESS constructs could be combined to compute an overall GUESS score that represents a player's satisfaction with a game. A model was developed and tested that used a composite score of the GUESS (i.e., Overall GUESS) as a replacement for each GUESS construct in the model. Discriminant validity was still an issue in the Escapist construct, so it was removed from the model. The removal of the Escapist construct and using the composite GUESS score resulted in a measurement model with no major validity issues and acceptable fit. However, the structural model did not fit even after adjusting the model based on modification indices that were recommended in AMOS. Thus, interpretations of the model could not be made.

Parsimonious Model

The third exploratory model was an extension of the composite GUESS model but attempted to improve model fit by testing a model with fewer latent variables (i.e., parsimonious model). Specifically, the parsimonious model was tested without the Fulfillment measures and the Escapist construct. The fulfillment measures were removed because they were adapted from the original Trojan Player Typology scale to determine the extent to which a game fulfills each motive. However, the goal of this research was to understand how game play motives, satisfaction, and continuance intentions were related.

Although the fulfillment measure provided interesting data on what the game is affording the player, it could have added unnecessary complexity to the model. Since the fulfillment of motive measures were directly derived from the motive measures, participants saw similar item wordings while taking the survey. For example, the participant would see the Socializer motive item, “I like to chat with my friends while playing a video game”, and the Socializer fulfillment item, “How well does the game allow you to chat with friends while playing the video game?”. The fulfillment of motive measure was adapted from the Trojan Player Typology to assess what the player was getting out of the gameplay. This is different from the motive measure (i.e., Trojan Player Typology) because it measured how well the game fulfilled a motive regardless of how much the player was motivated. For example, a player could rate that the game allows them to chat with friends while playing the video game, communicate, and play in a tightly knit group extremely well (i.e., fulfillment of motives for Socializer), even if that player was not motivated by the Socializer items. However, the analysis of the hypothesized measurement model suggested that these measures were not completely independent, as most of the motive measures predicted their respective fulfillment of motives construct (Figure 8). It was possible that

including both the motive measures and fulfillment measures would increase the amount of error in the analyses and reduce the model fit by increasing the complexity of the model. Thus, the fulfillment measures were removed from the analysis of the parsimonious model. The parsimonious measurement model had acceptable fit and validity. After adjusting for common method bias in the data, the parsimonious structural model fit well and had no issues with multicollinearity.

Final Model Interpretation

The research goals were to understand the relationships between game play motives, satisfaction, and continuance intention. Although many of the original hypotheses could not be tested with the final model, moving toward the simpler and better fitting model aligned with the goal of understanding these relationships. Ultimately, the parsimonious model had better validity, no issues with multicollinearity, and better fit than any other model tested in this research. More importantly, the final parsimonious structural model still allowed important research questions to be answered:

1. How are motives related to satisfaction?
2. How is satisfaction related to continuance intention?
3. How is satisfaction related to play time?

The findings suggest that players' satisfaction with a game has positive effects on their intention to continue playing the game and weekly play time, while players' satisfaction is significantly influenced by their motivations for playing. Gameplay motives explained 20% of the variance in satisfaction ($R^2 = .20$). These findings match the uses and gratifications theory, which suggests that players are gratified by different attributes of gameplay, such as social interaction (Wu et al., 2010). Players who are story-driven, competitors, smarty-pants, and/or

socializers tend to have higher satisfaction with the online games evaluated in this research. The only exception was that completionist motives did not significantly affect satisfaction.

Completionists play to explore all elements of a game fully (Kahn et al., 2015). Given the lack of relationship between the completionist motive and satisfaction, it could be that the completionist motive is simply unrelated to a player's overall satisfaction with a game. The games assessed in this research are online games that are constantly updated to encourage players to continually play. Players may be motivated to explore everything a game has to offer, regardless of whether or not they are satisfied (Cruz et al., 2017). Another possible explanation could be that the GUESS may not account for the satisfaction people may or may not derive from completionism.

Satisfaction explained 47% of the variance in continuance intention ($R^2 = .47$). The higher a player's satisfaction, the higher their intention to continue playing the game. Satisfaction explained 8% of the variance in weekly play time ($R^2 = .08$). This finding suggests that players who are satisfied tend to play more per week. However, this is a relatively small effect. Other variables that were not considered in the model may better account for weekly play time.

Implications

Findings from this research contribute to the literature by extending a unique model of gamer motivations, game satisfaction, and continuance intentions. To date, there is currently no known metric for assessing game user experience satisfaction that is more comprehensive, or rigorously developed and validated than the GUESS (Phan et al., 2016). Further, the Trojan Player Typology is a scale of player motivations that was validated using a factor analysis and a large sample (Kahn et al., 2015). Prior studies demonstrate the need for identifying individual

differences in gameplay motivations (Greenberg et al., 2010; Hamari & Keronen, 2017). This research indicates that individual differences in player motivation are important for predicting players' experience with a game. Specifically, this model suggests that players who are story-driven, competitors, smarty-pants, and/or socializers tend to have higher satisfaction with a game. Further, players with a better experience tend to want to continue playing and play more per week than less satisfied players. This study has identified a model that can act as a foundation for future experimentation in game satisfaction research.

Game companies may be able to use the outcomes of this research to inform their decisions while designing a game. Currently, the players who are more likely to be satisfied with the games tested in this research are Story-driven, Competitors, Smarty-pants, and Socializers. These findings suggest that players who play games to experience the story, play to win, to improve intelligence, or build and maintain social relationships tend to be more satisfied. This is important because higher satisfaction is related to higher intention to continue playing the game. Thus, if a game can satisfy these types of players, it could satisfy the players who are more likely to continue playing. A consistent player base that continues to play a game is important to the financial well-being of an online game.

According to these findings, game developers who work on games similar to the games tested in this research should focus on fulfilling motives to maximize a player's satisfaction with the game. Satisfaction could be measured using the GUESS during playtesting to compare different versions of gameplay. Game researchers could test whether implementing game features to support various motives improve player satisfaction. For example, to support Socializer motives a researcher could playtest to compare GUESS ratings for a baseline version of the game that doesn't include a chat system to a version that does include a chat system. This

comparison could help determine the extent to which a game feature designed to support player motives affects player satisfaction.

Some researchers have already begun to explore which game features support player satisfaction. Sailer, Hense, Mayr, & Mandl (2017) performed a series of randomized controlled trials to determine how varying game design elements affected fulfillment of basic psychological needs. They report that badges, leaderboards, and performance graphs enabled players to feel more competent (Sailer, Hense, Mayr, & Mandl, 2017). Other design elements, such as player avatars, meaningful stories, and teammates, helped players feel more related to other players (i.e., social relatedness; Sailer et al., 2017). They conclude that by varying game design elements, players needs are met in unique ways (Sailer et al., 2017). Game researchers should continue exploring how game design elements that support fulfillment of player motives affect satisfaction.

One novel aspect of this research is that while game motivations have been examined in relation to enjoyment and satisfaction, there has never been a study relating game motivations with a multifactor scale of satisfactions specific to gaming. This study assessed these relationships using the Game User Experience Satisfaction Scale (GUESS). Although a composite GUESS score was calculated for overall satisfaction, the composite score takes into consideration multiple factors that influence satisfaction: Usability/Playability, Narratives, Play Engrossment, Enjoyment, Creative Freedom, Audio Aesthetics, Personal Gratification, Social Connectivity, and Visual Aesthetics. An advantage of using the composite score is that the scale ranges from 9 to 63, which provides more variability in satisfaction ratings than a single-item scales.

Limitations

Data was collected using a convenience sample from multiple sources (i.e., SONA ERAU, SONA WSU, online forums, and Amazon Mechanical Turk). An effort was made to ensure that the recruited survey respondents were representative by adding pre-screening questions into the survey to screen out participants who did not meet eligibility criteria. However, the survey was posted online, which means that it is possible there is a part of the target population that may not have even had a chance to take the survey. Additionally, the sample size from each game was not equal. It was more difficult to find eligible *Hearthstone* players compared to the other games in the study. Further, there was evidence of common method bias in this sample. This is common when collecting multiple measures in a single survey. However, the final analysis accounted for this by imputing factor scores with a common latent factor in the model.

Age was not controlled during the recruiting process. Instead, participants were recruited as they became available. As a result, the distribution of age was limited to those between 18 and 49 years old ($M = 22.95$, $SD = 5.84$). According to the Entertainment Software Association (2016), the average age of a video game player is 35 years old (ESA, 2016). It is possible that online games chosen for this research have a different player demographics than the average video game player. Previous research reported that the average age of League of Legends players was 23 years old in a random sample of $n = 18,627$ players (Kahn et al., 2015). Other researchers reported the average age of World of Warcraft players was 29.95 ($SD = 9.2$) in a sample of $n = 2071$ players (Yee et al., 2012). However, there are currently no known publicly available age statistics for the other games studied in this research. An alternate SEM was tested with age as a control variable in the model. The model with age as a control fit well, $\chi^2(11) =$

19.49, $p = .05$, but was not significantly different than the parsimonious structural model, χ^2 difference = 0.22, $df = 0$, $p > .05$. Additionally, similar interpretations could be made after controlling for age in the model. However, there could be age effects outside of the age range of this sample. Future research could recruit video game players from all age ranges (less than 18 to 45+) to determine if age plays role in these effects.

Replacing the measurement model of the GUESS construct with an overall GUESS score resulted in acceptable model fit in the final model. However, the resulting model lost the context of how motives are related to specific GUESS constructs, and how specific GUESS constructs are related to continuance intentions. Instead, overall GUESS was interpreted as an omnibus measure of satisfaction with the game, while taking into consideration all components of the GUESS. Removing the fulfillment of motive measures created a simpler model but removed the extent to which motives were fulfilled as an explanatory variable for satisfaction. Removing the Escapist construct from motive fulfillment was necessary to improve discriminant validity in the measurement model. However, removing the Escapist measure does not make sense from a theoretical perspective. Past literature has theorized that escaping from reality is one of the core reasons people play games (Kahn et al., 2015). Additionally, several other gaming motivation scales reviewed in Table 5 included Escapist measures. Therefore, the removal of the Escapist construct may limit the interpretations of this research, as it cannot discuss how Escapist motives are related to satisfaction in the context of this research. It could be possible that other Escapist motive measures would fit better in this model.

Future Directions

Given that this research focuses on a set of online games that are popular, game satisfaction scores were slightly skewed toward the high end of the scale. Evaluating games that

score poorly on the GUESS would allow researchers to determine if certain player types are still motivated to continue playing a game even if they are not satisfied. For example, a completionist may want to finish a game to explore and collect all the objects and achievements that a game offers, even if she is not satisfied with the game. Players with a need to complete all achievements in a game may feel a compulsion to earn the achievements in a game (Cruz et al., 2017). A behavior like this could be related to the concept of persistence, in which people continue playing despite a lack of satisfaction (Huang et al., 2017; Neys, Jansz, & Tan, 2014). Alternatively, this research could be extended to investigate games that are satisfying, but have low continuance intentions to determine what motivates people to switch to another game even with high satisfaction (Tseng & Wang, 2013). Further, more future research could replicate this model in similar situations to explore other game types, such as different genres, different games within the genres tested here, offline games, mobile games, or educational games. Future testing could include longitudinal data to determine how continuance intention relates to long-term play behaviors.

Individual differences in niche gaming groups could be explored to examine the relationship between motivations and satisfaction. For example, do tournament players in *League of Legends*, *World of Warcraft*, *Overwatch*, and *Hearthstone* have a different motivational profile than non-tournament players? How does their motivational profile relate to game satisfaction? How can game designers use this information to create more enjoyable competitive (i.e., e-sports) game play? Can this information be used to improve continuance intentions?

Player background may play a role in the relationships between motivations and satisfaction. Specifically, participants in this research categorized themselves based on their

previous experience playing games. In one survey question, each participant self-identified as either a novice, casual, mid-core/core, or hardcore/expert player (i.e., player type). Appendix F lists descriptive statistics by each player type. Motive ratings for Trojan Player Typology scales appear to increase between the less experienced players (e.g., novice and casual) and the more experienced players (i.e., mid-core/core and hardcore/expert). For example, mean Socializer motive scores increased from 2.82 for novice players, 3.32 for casual players, 3.76 for mid-core/core players, and 4.20 for hardcore/expert players (Appendix F). Similarly, mean ratings for the other motive scores increase across player types. This could indicate that players with more experience or dedication (e.g., hardcore/expert) may be more motivated by the constructs in the Trojan Player Typology than less experienced players (e.g., novice). Thus, it is possible that these findings could be impacted by player type (i.e., novice, casual, mid-core/core, hardcore/expert). The sample size of novice players (n=28) may limit group analyses that can be performed using Structural Equation Modeling in these data. Future research could investigate the extent to which motives differ depending on player type and determine how player type impacts the final model.

Game type may play a role in the relationships between motivations and satisfaction. Specifically, motive ratings may differ depending on the game type (i.e., Massively Multiplayer Online Role Playing Game, Multiplayer Online Battle Arena, Team First Person Shooter, Collectible Card Game). Appendix G lists descriptive statistics by each game type. Mean motivation scores on the Trojan Player Typology do not seem to drastically differ between game types (Appendix G). The sample size of Hearthstone players (n=26) may limit group analyses that can be performed using Structural Equation Modeling in these data. Future

research could investigate the extent to which motives differ depending on game type and determine how the type of game impacts the final model.

Finally, future research could help identify how to fulfill motives, to help game designers create more satisfying experiences that are tailored to specific player motivations. As discussed above, researchers should continue exploring how specific game design elements that support fulfillment of player motives affect satisfaction.

Conclusion

This dissertation proposed and assessed a model of gameplay motivations, satisfactions, and continuance intentions that can be used as a foundation for future research in game satisfaction research. Data was collected from 353 video game players across 4 online games, using previously validated measures. Discriminant validity was an issue with the initially hypothesized model. A series of exploratory analyses identified a model with acceptable validity and fit. The final model suggested that gameplay motivations (except Completionist motives) are positively related to satisfaction, while satisfaction is positively related to continuance intention and weekly play time. Player motivations accounted for 20% of the variance in satisfaction. Further, satisfaction accounted for 47% of the variance in continuance intention and 8% of the variance in weekly play time. Thus, it seems that individual differences in gameplay motivation play an important role in a player's satisfaction with a game. This is significant because satisfaction appears to be central to a player's intention to continue playing a game.

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APPENDICES

APPENDIX A

SURVEY ITEMS AND CONSTRUCTS

DEMOGRAPHICS

- Age
- Gender
- Occupation
- Ethnicity
- Education
- English as Native Language

GAME EXPERIENCE SCREENER

- Do you play video games on at least one of the following devices: cellphone/smartphone, tablet, console, desktop, laptop, and handheld device? (Non-gamers are excluded)
- At what age did you first begin playing video games? Please enter a whole number.
- What type of video game player do you consider yourself? (newbie/novice, casual, core/mid-core, hard-core/expert)
- What is/are your MAIN reason(s) for playing video games? (to “let off” some steam, to challenge my mind, to waste time, to immerse myself in another world, to socialize with other people, to compete with other people or computers, for pure enjoyment, boredom, to follow a storyline, to live another life, to improve my physical/mental skills, to gain power, Other)
- On average, how many hours do you spend playing video games per week?
- When was the last time you played video games?
- In general, please check the frequency that best describes the frequency in which you play video games on the following devices. (PC, console, handheld, mobile).
- Rate your level of OVERALL knowledge about video games using the following scale. (1: novice, 4: Intermediate, 7: Expert)
- In general, please check the frequency circle that best describes the frequency in which you play the following game genres. (action, sim, driving, puzzle/card, role playing, adventure, strategy, sports, fighting, music/dance, educational/edutainment, fitness, social/social network, retro/classic)
- Must play at least one of identified games within the last 3 months for at least 10 hours. (All other gamers are excluded)
 - League of Legends (MOBA),
 - World of Warcraft (MMO),
 - Overwatch (First Person Shooter),
 - Hearthstone (Free to play, Mobile, Card Game)
- When was the last time you played the game?
- Do you feel like you have completed the game?
- Did you stop playing this game? If so, why did you stop playing the game?

APPENDIX A (continued)

PLAY TIME

- On average, how many hours do you spend playing the game per week?

TROJAN PLAYER TYPOLOGY

From Kahn et al. (2015)

Rate the extent to which you agree or disagree with the following statements about why you play games. (1 = Strongly Disagree to 5 = Strongly Agree)

Socializers

1. I like to chat with my friends while playing a video game
2. I like to use voice communication when I play
3. It's important to me to play with a tightly knit group

Completionists

1. I like to master all elements of a game
2. I like to figure out how the game works inside and out
3. I like to try everything that is possible to do in a game

Competitors

1. Winning is a big reason for me to play video games
2. I play to win
3. It is important to me to be the fastest and most skilled person playing the game

Escapists

1. I like to do things in games which I cannot do in real life
2. Video games allow me to pretend I am someone/somewhere else

Story-driven

1. I like the feeling of being part of a story
2. I like stories in a game

Smarty-pants

1. Games make me smarter
2. I play games to enhance my intellectual abilities

APPENDIX A (continued)

PERCEIVED FULFILLMENT OF GAME MOTIVES

Self-created measure of perceived fulfillment of game play motivations adapted from Kahn et al., 2015. (1 = Not well at all; 5 = Extremely well; 6 = Not applicable)

1. How well does the game allow you to... (*Socializer*)
 - a. ...chat with friends while playing the video game
 - b. ...use voice communication when you play
 - c. ...play with a tightly knit group
2. How well does the game allow you to... (*Completionist*)
 - a. ...master all elements of the game
 - b. ...figure out how the game works inside and out
 - c. ...try everything that is possible to do in the game
3. How well does the game allow you to... (*Competitors*)
 - a. ...win
 - b. ...play to win
 - c. ...be the fastest and most skilled person playing the game
4. How well does the game allow you to... (*Escapists*)
 - a. ...do things in the game which you cannot do in real life
 - b. ...pretend you are someone/somewhere else
5. How well does the game allow you to... (*Story-driven*)
 - a. ...be part of the story
 - b. ...experience stories in the game
6. How well does the game allow you to... (*Smarty-pants*)
 - a. ...get smarter
 - b. ...enhance your intellectual abilities

GAME USER EXPERIENCE SATISFACTION SCALE (GUESS)

From Phan et al. (2016)

(1 = Strongly Disagree; 7 = Strongly Agree)

Usability/Playability (11 items)

1. I think it is easy to learn how to play the game.
8. I find the controls of the game to be straightforward.
14. I always know how to achieve my goals/objectives in the game.
17. I find the game's interface to be easy to navigate.
25. I do not need to go through a lengthy tutorial or read a manual to play the game.
29. I find the game's menus to be user friendly.
33. I feel the game trains me well in all of the controls.
37. I always know my next goal when I finish an event in the game.
44. I feel the game provides me the necessary information to accomplish a goal within the game.

APPENDIX A (continued)

48. I feel very confident while playing the game.

52. I think the information provided in the game (e.g., onscreen messages, help) is clear.

Narratives (7 items)

3. I am captivated by the game's story from the beginning.

9. I think the characters in the game are well developed.

22. I enjoy the fantasy or story provided by the game.

32. I can identify with the characters in the game.

42. I am emotionally moved by the events in the game.

49. I can clearly understand the game's story.

55. I am very interested in seeing how the events in the game will progress.

Play Engrossment (8 items)

2. I cannot tell that I am getting tired while playing the game.

11. I tend to spend more time playing the game than I have planned.

19. Whenever I stopped playing the game I cannot wait to start playing it again.

21. I feel detached from the outside world while playing the game.

26. I can block out most other distractions when playing the game.

36. I do not care to check events that are happening in the real world during the game.

43. Sometimes I lose track of time while playing the game.

51. I temporarily forget about my everyday worries while playing the game.

Enjoyment (5 items)

6. I think the game is fun.

15. I feel bored while playing the game. (REVERSE CODE)

27. If given the chance, I want to play this game again.

38. I am likely to recommend this game to others.

50. I enjoy playing the game.

Creative Freedom (7 items)

5. I feel the game allows me to be imaginative.

12. I feel creative while playing the game.

23. I feel I can explore things in the game.

31. I feel the game allows me to express myself.

40. I feel my curiosity is stimulated as the result of playing the game.

46. I think the game is unique or original.

53. I feel the game gives me enough freedom to act how I want.

Audio Aesthetics (4 items)

7. I enjoy the sound effects in the game.

16. I think the game's audio fits the mood or style of the game.

28. I feel the game's audio (e.g., sound effects, music) enhances my gaming experience.

47. I enjoy the music in the game.

APPENDIX A (continued)

Personal Gratification (6 items)

- 4. I am in suspense about whether I will succeed in the game.
- 13. I feel successful when I overcome the obstacles in the game.
- 18. I feel the game constantly motivates me to proceed further to the next stage or level.
- 24. I find my skills gradually improve through the course of overcoming the challenges in the game.
- 34. I am very focused on my own performance while playing the game.
- 54. I want to do as well as possible during the game.

Social Connectivity (4 items)

- 10. I find the game supports social interaction (e.g., chat) between players.
- 41. I am able to play the game with other players if I choose.
- 30. I like to play this game with other players.
- 35. I enjoy the social interaction within the game.

Visual Aesthetics (3 items)

- 20. I enjoy the game's graphics.
- 39. I think the game is visually appealing.
- 45. I think the graphics of the game fit the mood or style of the game.

OVERALL SATISFACTION (SINGLE QUESTION)

From Phan et al., (2016). (1 = Extremely Dissatisfied; 7 = Extremely Satisfied)

- How satisfied are you with the game? (It's okay if you do not like it, we are interested in your point of view whether or not you like the game)

CONTINUANCE INTENTION TO PLAY

Adapted from Hsaio & Chiou (2017), who adapted from Zeithaml et al (1996)

(1 = Strongly Disagree; 7 = Strongly Agree)

- In the future, I will continue to play XYZ
- In the future, I will play XYZ often
- I will say advantages of XYZ to other people
- I will recommend XYZ to other people

**XYZ will be replaced with the game the player is rating.*

APPENDIX B

DEMOGRAPHICS BY GAME TYPE

	Entire sample (N = 353)	Hearthstone (n=26)	League of Legends (n=89)	Overwatch (n=129)	World of Warcraft (n=109)
Player Type					
Newbie/Novice	7.9%	3.8%	5.6%	5.4%	13.8%
Casual	39.9%	38.5%	37.1%	36.4%	46.8%
Mid-core/Core	38.8%	57.7%	46.1%	41.9%	24.8%
Hardcore/Expert	13.3%	0.0%	11.2%	16.3%	14.7%
Gender					
Male	59.8%	65.4%	69.7%	70.5%	37.6%
Female	38.8%	34.6%	30.3%	27.9%	59.6%
Other	1.4%	0.0%	0.0%	1.6%	2.8%
Ethnicity					
American Indian/Alaska Native	1.1%	3.8%	2.2%	0.8%	0.0%
Asian/Pacific Islander	14.7%	15.4%	25.8%	11.6%	9.2%
Biracial/Multiracial/Mixed	3.7%	0.0%	3.4%	3.9%	4.6%
Black/African American	3.4%	3.8%	2.2%	3.1%	4.6%
Hispanic/Latino	8.8%	7.7%	9.0%	9.3%	8.3%
White (not of Hispanic origin)	66.3%	69.2%	52.8%	71.3%	70.6%
I do not wish to answer	2.0%	0.0%	4.5%	0.0%	2.8%
Education Level					
Less than high school	0.3%	0.0%	0.0%	0.8%	0.0%
High school graduate	21.5%	26.9%	21.3%	24.0%	17.4%
Some college	47.0%	30.8%	47.2%	51.2%	45.9%
2 year degree	10.2%	15.4%	6.7%	8.5%	13.8%
4 year degree	14.4%	15.4%	15.7%	12.4%	15.6%
Masters	5.1%	3.8%	5.6%	3.1%	7.3%
Professional degree	1.4%	7.7%	3.4%	0.0%	0.0%
Age in years, <i>Mean (SD)</i>	22.95 (5.84)	24.65 (7.31)	23.13 (6.31)	21.58 (4.16)	24.01 (6.46)
Age Range	18 - 49	18 - 49	18 - 46	18 - 46	18 - 48

APPENDIX B (continued)

	Entire sample (N = 353)	Hearthstone (n=26)	League of Legends (n=89)	Overwatch (n=129)	World of Warcraft (n=109)
Weekly Play Time in hours, <i>Mean (SD)</i>	10.89 (11.81)	9.65 (12.89)	11.94 (12.45)	9.31 (10.65)	12.20 (12.22)
Overall Satisfaction Level, <i>Mean (SD)</i>	5.74 (1.23)	5.31 (1.35)	5.64 (1.25)	5.90 (1.24)	5.72 (1.16)
Overall GUESS Score, <i>Mean (SD)</i>	49.88 (6.42)	48.49 (6.11)	48.80 (5.78)	50.46 (6.16)	50.40 (7.16)

APPENDIX C

DEMOGRAPHICS BY DATA SOURCE

	Entire sample (N = 353)	ERAU (n=74)	Mturk (n=47)	NonSONA (n=78)	WSU (n=154)
Player Type					
Newbie/Novice	7.9%	5.4%	0.0%	1.3%	14.9%
Casual	39.9%	40.5%	34.0%	20.5%	51.3%
Mid-core/Core	38.8%	37.8%	51.1%	59.0%	25.3%
Hardcore/Expert	13.3%	16.2%	14.9%	19.2%	8.4%
Gender					
Male	59.8%	81.1%	57.4%	73.1%	43.5%
Female	38.8%	18.9%	40.4%	24.4%	55.2%
Other	1.4%	0.0%	2.1%	2.6%	1.3%
Ethnicity					
American Indian/Alaska Native	1.1%	1.4%	6.4%	0.0%	0.0%
Asian/Pacific Islander	14.7%	21.6%	36.2%	10.3%	7.1%
Biracial/Multiracial/Mixed	3.7%	4.1%	6.4%	0.0%	4.5%
Black/African American	3.4%	2.7%	4.3%	1.3%	4.5%
Hispanic/Latino	8.8%	9.5%	2.1%	6.4%	11.7%
White (not of Hispanic origin)	66.3%	59.5%	42.6%	82.1%	68.8%
I do not wish to answer	2.0%	1.4%	2.1%	0.0%	3.2%
Education Level					
Less than high school	0.3%	0.0%	0.0%	1.3%	0.0%
High school graduate	21.5%	27.0%	2.1%	15.4%	27.9%
Some college	47.0%	58.1%	17.0%	33.3%	57.8%
2 year degree	10.2%	8.1%	10.6%	10.3%	11.0%
4 year degree	14.4%	6.8%	48.9%	23.1%	3.2%
Masters	5.1%	0.0%	12.8%	15.4%	0.0%
Professional degree	1.4%	0.0%	8.5%	1.3%	0.0%
Age in years, <i>Mean (SD)</i>	22.95 (5.84)	20.62 (2.98)	30.34 (6.64)	24.10 (5.16)	21.23 (4.95)
Age Range	18 - 49	18 - 37	20 - 49	18 - 43	18 - 46
Weekly Play Time in hours, <i>Mean (SD)</i>	10.89 (11.81)	10.03 (12.10)	14.94 (13.35)	13.17 (10.56)	8.92 (11.37)
Overall Satisfaction Level, <i>Mean (SD)</i>	5.74 (1.23)	5.57 (1.26)	6.34 (0.94)	6.06 (1.30)	5.47 (1.16)
Overall GUESS Score, <i>Mean (SD)</i>	49.88 (6.42)	49.30 (6.37)	54.04 (5.07)	50.55 (6.11)	48.54 (6.43)

APPENDIX D

DESCRIPTIVE STATISTICS FOR EACH CONSTRUCT

Measure	Construct	Mean	SD
<i>Motives</i>	Socializer	3.57	1.08
	Completionist	3.94	0.80
	Competitor	3.67	0.93
	Escapist	3.83	0.94
	Story driven	4.21	0.86
	Smarty pants	3.44	0.89
<i>Fulfillment of Motive</i>	Socializer	3.80	0.98
	Completionist	3.67	0.83
	Competitor	3.81	0.85
	Escapist	3.84	0.96
	Story driven	3.10	1.26
	Smarty pants	3.02	1.11
<i>Satisfaction</i>	Usability/Playability	5.60	0.79
	Narratives	5.02	1.13
	Play Engrossment	4.99	1.06
	Enjoyment	5.83	1.03
	Creative Freedom	5.13	1.04
	Audio Aesthetic	5.72	1.01
	Personal Gratification	5.80	0.76
	Social Connectivity	5.72	0.95
<i>Continuance Intention</i>	Visual Aesthetic	6.07	0.86
	Continuance Intention	5.41	1.25

APPENDIX E

SKEWNESS AND KURTOSIS VALUES OF ITEMS

Construct	Items	Mean	SD	Skewness		Kurtosis		
				Value	Std Error	Value	Std Error	
<i>Motives</i>	Socializer	trojan_type_1	3.84	1.26	-0.87	0.13	-0.39	0.26
		trojan_type_2	3.51	1.35	-0.55	0.13	-0.90	0.26
		trojan_type_3	3.35	1.24	-0.37	0.13	-0.86	0.26
	Completionist	trojan_type_4	3.96	1.00	-0.92	0.13	0.45	0.26
		trojan_type_5	3.80	1.05	-0.74	0.13	-0.21	0.26
		trojan_type_6	4.05	0.97	-1.04	0.13	0.75	0.26
	Competitor	trojan_type_7	3.69	1.11	-0.61	0.13	-0.41	0.26
		trojan_type_8	3.99	0.98	-0.77	0.13	-0.15	0.26
		trojan_type_9	3.31	1.15	-0.30	0.13	-0.76	0.26
	Escapist	trojan_type_10	4.09	0.98	-1.04	0.13	0.74	0.26
		trojan_type_11	3.57	1.18	-0.52	0.13	-0.62	0.26
	Story driven	trojan_type_12	4.08	0.98	-1.00	0.13	0.56	0.26
		trojan_type_13	4.35	0.90	-1.67	0.13	2.97	0.26
	Smarty pants	trojan_type_14	3.54	0.97	-0.48	0.13	0.06	0.26
		trojan_type_15	3.35	1.04	-0.16	0.13	-0.65	0.26
<i>Fulfillment of Motive</i>	Socializer	motive_fulfill_1	3.91	1.14	-0.84	0.13	-0.06	0.26
		motive_fulfill_2	3.61	1.34	-0.68	0.13	-0.71	0.26
		motive_fulfill_3	3.88	1.05	-0.68	0.13	-0.23	0.26
	Completionist	motive_fulfill_4	3.60	1.05	-0.31	0.13	-0.59	0.26
		motive_fulfill_5	3.66	1.05	-0.53	0.13	-0.27	0.26
		motive_fulfill_6	3.75	1.05	-0.56	0.13	-0.28	0.26
	Competitor	motive_fulfill_7	3.81	0.99	-0.50	0.13	-0.34	0.26
		motive_fulfill_8	4.06	1.00	-0.97	0.13	0.48	0.26
		motive_fulfill_9	3.56	1.06	-0.33	0.13	-0.42	0.26
	Escapist	motive_fulfill_10	4.11	1.03	-1.11	0.13	0.66	0.26
		motive_fulfill_11	3.57	1.23	-0.52	0.13	-0.69	0.26
	Story driven	motive_fulfill_12	3.09	1.32	-0.05	0.13	-1.13	0.26
		motive_fulfill_13	3.12	1.32	-0.13	0.13	-1.07	0.26
	Smarty pants	motive_fulfill_14	2.98	1.18	0.09	0.13	-0.87	0.26

APPENDIX E (continued)

Construct	Items	Mean	SD	Skewness		Kurtosis	
				Value	Std Error	Value	Std Error
	motive_fulfill_15	3.06	1.20	0.09	0.13	-0.89	0.26
<i>Satisfaction</i>	Usability/Playability						
	Q1	5.33	1.40	-0.97	0.13	0.74	0.26
	Q2	5.88	1.08	-1.14	0.13	1.30	0.26
	Q3	5.64	1.15	-0.83	0.13	0.36	0.26
	Q4	5.86	0.96	-0.91	0.13	1.49	0.26
	Q5	5.13	1.63	-0.80	0.13	-0.16	0.26
	Q6	5.86	0.98	-1.04	0.13	1.50	0.26
	Q7	5.50	1.18	-0.91	0.13	0.85	0.26
	Q8	5.44	1.27	-0.79	0.13	0.26	0.26
	Q9	5.82	1.16	-1.28	0.13	2.12	0.26
	Q10	5.80	1.03	-1.20	0.13	1.97	0.26
	Q11	5.37	1.27	-0.78	0.13	0.40	0.26
	Narratives						
	Q12	5.72	1.26	-1.11	0.13	1.12	0.26
	Q13	4.62	1.69	-0.41	0.13	-0.69	0.26
	Q14	5.34	1.43	-0.86	0.13	0.49	0.26
	Q15	4.69	1.60	-0.47	0.13	-0.36	0.26
	Q16	4.12	1.75	-0.13	0.13	-0.95	0.26
	Q17	5.61	1.29	-1.30	0.13	2.06	0.26
	Q18	5.04	1.51	-0.70	0.13	-0.11	0.26
	Play Engrossment						
	Q19	4.82	1.57	-0.51	0.13	-0.50	0.26
	Q20	4.41	1.71	-0.15	0.13	-1.05	0.26
	Q21	4.41	1.75	-0.27	0.13	-1.04	0.26
	Q22	5.61	1.38	-1.14	0.13	0.88	0.26
	Q23	5.47	1.38	-1.04	0.13	0.91	0.26
	Q24	5.14	1.53	-0.65	0.13	-0.37	0.26
	Q25	5.51	1.29	-1.04	0.13	1.04	0.26
	Q26	4.52	1.59	-0.19	0.13	-0.81	0.26
	Enjoyment						
	Q27	6.19	1.04	-1.93	0.13	5.18	0.26
	Q28	6.04	1.12	-1.64	0.13	3.39	0.26
	Q29	5.08	1.57	-0.78	0.13	-0.22	0.26

APPENDIX E (continued)

Construct	Items	Mean	SD	Skewness		Kurtosis	
				Value	Std Error	Value	Std Error
Creative Freedom	Q30	5.83	1.32	-1.32	0.13	1.70	0.26
	Q31	6.00	1.20	-1.65	0.13	2.99	0.26
	Q32	5.20	1.43	-0.82	0.13	0.42	0.26
	Q33	4.94	1.46	-0.71	0.13	0.17	0.26
	Q34	5.32	1.35	-0.93	0.13	0.82	0.26
	Q35	4.81	1.46	-0.62	0.13	0.00	0.26
	Q36	5.08	1.55	-0.67	0.13	-0.36	0.26
Audio Aesthetic	Q37	5.06	1.37	-0.51	0.13	-0.19	0.26
	Q38	5.50	1.33	-0.89	0.13	0.33	0.26
	Q39	5.87	1.18	-1.22	0.13	1.56	0.26
	Q40	5.30	1.43	-0.77	0.13	0.35	0.26
	Q41	5.76	1.22	-1.05	0.13	1.17	0.26
	Q42	5.93	1.05	-1.15	0.13	2.03	0.26
Personal Gratification	Q43	5.15	1.48	-0.74	0.13	0.14	0.26
	Q44	6.07	0.98	-1.61	0.13	4.69	0.26
	Q45	6.13	1.00	-1.46	0.13	3.00	0.26
	Q46	5.94	1.04	-1.07	0.13	1.53	0.26
	Q47	5.56	1.23	-0.99	0.13	1.18	0.26
Social Connectivity	Q48	5.96	0.95	-0.85	0.13	0.81	0.26
	Q49	5.62	1.35	-1.20	0.13	1.51	0.26
	Q50	5.87	1.30	-1.28	0.13	1.49	0.26
	Q51	6.16	1.00	-1.21	0.13	1.24	0.26
Visual Aesthetic	Q52	5.24	1.47	-1.01	0.13	0.84	0.26
	Q53	6.04	1.01	-1.36	0.13	2.60	0.26
	Q54	6.16	0.91	-1.11	0.13	1.28	0.26
	Q55	6.01	1.04	-1.34	0.13	2.21	0.26
<i>Continuance Intention</i>	continue_1	5.59	1.42	-1.34	0.13	1.75	0.26
	continue_2	5.14	1.52	-0.77	0.13	0.09	0.26
	continue_3	5.27	1.36	-0.91	0.13	0.69	0.26

APPENDIX E (continued)

Construct	Items	Mean	SD	Skewness		Kurtosis	
				Value	Std Error	Value	Std Error
<i>Play Time</i>	continue_4	5.64	1.30	-1.34	0.13	2.14	0.26
	playtime_week	10.89	11.81	2.43	0.13	7.18	0.26

APPENDIX F

DESCRIPTIVE STATISTICS BY PLAYER TYPE

Construct	Entire Sample (N = 353)		Newbie/Novice (n=28)		Casual (n = 141)		Mid-core/ Core (n=137)		Hardcore/Expert (n = 47)	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Age	22.95	5.84	20.32	2.79	21.97	5.57	24.21	6.33	23.77	5.55
Knowledge of Games	4.86	1.41	2.64	1.31	4.27	1.14	5.43	0.84	6.30	1.02
Weekly Play Time (hours)	10.89	11.81	4.00	3.94	9.68	11.55	11.02	10.45	18.26	15.48
Overall Satisfaction Level	5.74	1.23	4.96	1.32	5.72	1.06	5.76	1.39	6.19	0.92
Overall GUESS Score	49.88	6.42	44.89	6.88	49.72	6.00	50.41	6.39	51.77	6.10
<i>Motives</i>										
Socializer	3.57	1.08	2.82	1.00	3.32	1.08	3.76	1.00	4.20	0.91
Completionist	3.94	0.80	3.37	1.03	3.81	0.81	4.04	0.67	4.35	0.72
Competitor	3.67	0.93	3.33	0.93	3.55	0.90	3.68	0.94	4.17	0.79
Escapist	3.83	0.94	3.09	1.01	3.76	0.89	3.97	0.90	4.06	0.91
Story driven	4.21	0.86	3.43	1.23	4.17	0.75	4.36	0.80	4.37	0.82
Smarty pants	3.44	0.89	3.14	0.89	3.41	0.83	3.41	0.89	3.81	0.95
<i>Fulfillment of Motive</i>										
Socializer	3.80	0.98	3.37	0.93	3.61	0.91	3.95	0.95	4.18	1.10
Completionist	3.67	0.83	3.27	0.89	3.73	0.79	3.62	0.81	3.89	0.89
Competitor	3.81	0.85	3.27	0.90	3.73	0.84	3.87	0.80	4.18	0.80
Escapist	3.84	0.96	3.63	0.84	3.91	0.94	3.73	0.98	4.11	0.95
Story driven	3.10	1.26	3.36	0.90	3.38	1.17	2.83	1.32	2.95	1.38
Smarty pants	3.02	1.11	2.63	1.21	3.06	1.00	3.01	1.14	3.17	1.23
<i>Satisfaction</i>										
Usability/Playability	5.60	0.79	4.99	0.74	5.53	0.80	5.71	0.75	5.87	0.69
Narratives	5.02	1.13	4.83	0.78	5.06	1.07	5.01	1.23	5.05	1.24
Play Engrossment	4.99	1.06	4.41	1.16	5.04	1.03	4.98	1.06	5.17	1.02
Enjoyment	5.83	1.03	4.89	1.25	5.84	0.90	5.93	1.02	6.05	1.04
Creative Freedom	5.13	1.04	4.97	0.86	5.24	0.95	5.01	1.12	5.24	1.10
Audio Aesthetic	5.72	1.01	5.21	1.14	5.61	0.95	5.86	1.04	5.91	0.90
Personal Gratification	5.80	0.76	5.22	0.87	5.72	0.77	5.89	0.68	6.13	0.66
Social Connectivity	5.72	0.95	4.95	0.98	5.64	0.80	5.83	1.00	6.10	0.97
Visual Aesthetic	6.07	0.86	5.43	0.93	6.02	0.81	6.19	0.89	6.26	0.69

APPENDIX F (continued)

Construct	Entire Sample (N = 353)		Newbie/Novice (n=28)		Casual (n = 141)		Mid-core/ Core (n=137)		Hardcore/Expert (n = 47)	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Continuance Intention	5.41	1.25	4.54	1.53	5.34	1.11	5.52	1.26	5.81	1.22

APPENDIX G

DESCRIPTIVE STATISTICS BY GAME

Construct	Entire Sample (N = 353)		Hearthstone (n=26)		League of Legends (n=89)		Overwatch (n=129)		World of Warcraft (n=109)	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
<i>Descriptives</i>										
Age	22.95	5.84	24.65	7.31	23.13	6.31	21.58	4.16	24.01	6.46
Knowledge of Games	4.86	1.41	4.77	1.07	4.84	1.29	5.16	1.39	4.54	1.54
Weekly Play Time (hours)	10.89	11.81	9.65	12.89	11.94	12.45	9.31	10.65	12.20	12.22
Overall Satisfaction Level	5.74	1.23	5.31	1.35	5.64	1.25	5.90	1.24	5.72	1.16
Overall GUESS Score	49.88	6.42	48.49	6.11	48.80	5.78	50.46	6.16	50.40	7.16
<i>Motives</i>										
Socializer	3.57	1.08	3.22	1.25	3.70	0.94	3.68	1.11	3.39	1.09
Completionist	3.94	0.80	3.91	0.88	3.92	0.86	3.98	0.67	3.90	0.88
Competitor	3.67	0.93	3.85	0.91	3.71	0.92	3.60	0.91	3.66	0.96
Escapist	3.83	0.94	3.79	1.05	3.66	0.95	3.89	0.95	3.90	0.87
Story driven	4.21	0.86	4.25	0.91	4.05	0.87	4.36	0.86	4.16	0.81
Smarty pants	3.44	0.89	3.50	1.11	3.57	1.02	3.29	0.78	3.50	0.82
<i>Fulfillment of Motive</i>										
Socializer	3.80	0.98	2.92	1.17	3.65	0.93	4.11	0.87	3.76	0.93
Completionist	3.67	0.83	3.72	0.73	3.68	0.86	3.56	0.80	3.78	0.84
Competitor	3.81	0.85	4.03	0.71	3.88	0.85	3.98	0.77	3.50	0.89
Escapist	3.84	0.96	3.02	1.21	3.76	0.96	3.82	0.92	4.14	0.79
Story driven	3.10	1.26	2.69	1.13	2.76	1.27	2.59	1.11	4.09	0.82
Smarty pants	3.02	1.11	3.81	1.07	3.22	1.03	2.58	1.03	3.18	1.09
<i>Satisfaction</i>										
Usability/Playability	5.60	0.79	5.64	0.81	5.30	0.75	5.81	0.71	5.59	0.83
Narratives	5.02	1.13	4.75	1.23	4.78	1.17	4.86	1.11	5.48	0.98
Play Engrossment	4.99	1.06	4.75	0.87	5.02	0.98	4.93	1.11	5.09	1.11
Enjoyment	5.83	1.03	5.79	0.91	5.75	0.93	6.02	1.02	5.67	1.12
Creative Freedom	5.13	1.04	4.94	1.05	4.98	1.02	4.87	1.06	5.61	0.85
Audio Aesthetic	5.72	1.01	5.95	0.86	5.50	0.97	5.89	1.00	5.64	1.06
Personal Gratification	5.80	0.76	5.71	0.70	5.90	0.70	5.84	0.72	5.70	0.85

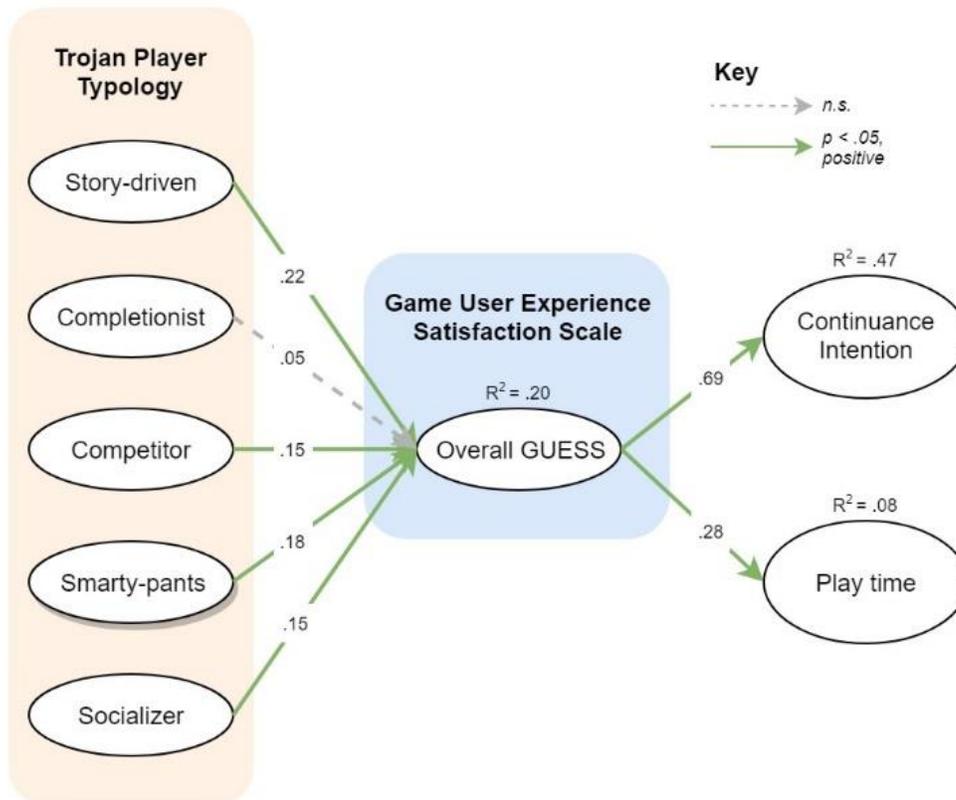
APPENDIX G (continued)

Construct	Entire Sample (N = 353)		Hearthstone (n=26)		League of Legends (n=89)		Overwatch (n=129)		World of Warcraft (n=109)	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Social Connectivity	5.72	0.95	5.03	1.08	5.73	0.83	5.90	0.96	5.68	0.94
Visual Aesthetic	6.07	0.86	5.94	0.91	5.85	0.80	6.35	0.69	5.96	0.99
<i>Continuance Intention</i>	5.41	1.25	5.51	1.12	5.25	1.15	5.59	1.24	5.31	1.35

APPENDIX H

STANDARDIZED DIRECT, INDIRECT, AND TOTAL EFFECTS

Effect	Construct	Smarty-pants	Story driven	Competitor	Completionist	Socializer	GUESS Overall
Direct	GUESS Overall	0.18	0.22	0.15	0.05	0.15	<i>N/A</i>
	Continuance Intention	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	0.69
	Play Time	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	0.28
Indirect	GUESS Overall	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
	Continuance Intention	0.12	0.15	0.10	0.03	0.11	<i>N/A</i>
	Play Time	0.05	0.06	0.04	0.01	0.04	<i>N/A</i>
Total	GUESS Overall	0.18	0.22	0.15	0.05	0.15	<i>N/A</i>
	Continuance Intention	0.12	0.15	0.10	0.03	0.11	0.69
	Play Time	0.05	0.06	0.04	0.01	0.04	0.28



APPENDIX H (continued)

Direct Effects

Smarty-pants, Story driven, Competitor, and Socializer motives were positively related to player satisfaction (Overall GUESS). Completionist motives were not significantly ($p > .05$) related to player satisfaction. Satisfaction was predictive of greater continuance intention and play time.

Indirect Effects

Player motives (Smarty-pants, Story driven, Competitor, and Socializer) were indirectly positively related to continuance intention and play time. A bootstrap with 2000 samples and a bias-corrected 95% confidence interval was performed to determine if indirect effects were significant. All indirect effects were significant ($p < .05$) except for the indirect effect of the Completionist motive on continuance intention and play time. This suggests that a relationship between motives and continuance intention may be mediated by satisfaction. Similarly, the relationship between motives and play time may be mediated by satisfaction.

APPENDIX I

EFFECT OF GAME ON MOTIVES

Motives	Game			
	Hearthstone	League of Legends	Overwatch	World of Warcraft
Story driven	Look up backstory, not in-game	Look up backstory, not in-game	Look up backstory, not in-game	Story built into gameplay (optional)
Completionist	Collect or unlock all cards	Unlock all characters and accessories (skins)	Unlock all accessories (skins, sprays, emotes)	Complete achievements, explore, etc. Always something to complete.
Escapist	Escape from real life	Escape from real life	Escape from real life	Escape from real life in a persistent digital world
Competitor	Versus other players	Versus other players	Versus other players	Versus other players (optional)
Smarty-pants	Constantly improve deck and memorize card interactions	Constantly improve character skills and strategize with team	Constantly improve character skills and strategize with team	Constantly improve character skills and strategize with team
Socializer	Non-verbal pings. Typed chat for friends only.	Non-verbal pings. Typed chat during a match. In-game voice chat.	Non-verbal emotes. Typed chat during a match. In-game voice chat.	Typed chat. In-game voice chat.