ADDICTION AND THE STRUCTURAL CHARACTERISTICS OF MASSIVELY MULTIPLAYER ONLINE GAMES.

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Abstract

This work begins by providing a comprehensive review of videogame-related literature in fields as diverse as communications, psychology, sociology, and neuroscience; this reading suggested that behaviors noted as detrimental in psychology and neuroscience were being observed in studies of Massively Multiplayer Online (MMO) gamers. The current research provides data which suggests that a player's perceived use of varied structural characteristics within a game is related to differing addiction and engagement levels. In particular, the constructs of negative valence, side activities, and interaction with real life friends within MMO games had distinct relationships with each addiction and engagement levels. When structural characteristics were controlled for, PvP advancement and guild preference appeared to be significant predictors of addiction or engagement. While the primary aim was to offer preliminary data comparing structural characteristics and addiction, this work also discusses the benefits and limitations of sampling respondents within MMO game worlds.

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Preface

Research and analysis into games is nascent, but critical. Gamers are playing to such excess that they die (Kim, 2006), in worlds which have the potential to draw in almost anybody (Yee, 2006; Griffiths, 2003). But are the games to blame? Researchers in fields as diverse as psychology, neurobiology, and communication are all trying to answer this question. So far, all we can assume is that some people play too much, in a pattern that is very similar to many behavioral addictions recognized today. If addiction is operant among gamers, does this then suggest that other media forms might be probed for addictive qualities? Very few scholars have actually investigated addiction to games, however many directions for research can be inferred by comparing studies of games against addiction research.

Addiction work in psychology and neuroscience provides criteria on addiction, even as it applies to Massively Multiplayer Online (MMO) game players (Brown, 1997, Depue & Collins, 1999, Charlton & Danforth, 2004). Meanwhile Wood, Griffiths, Chappell and Davies (2004) have examined the "structural characteristics" of single player games, looking particularly at which of these elements were most important to videogame players. Researchers in more humanities-centered approaches, specifically communications, have isolated the major motivations driving players of MMO games (Yee, 2006). These motivations are connected to what may be called structural characteristics of MMO games; in other words, gamers may be motivated to play specific parts of a game. The varied literature does seem to suggest that comparing addiction fundamentals in psychology and neuroscience against studies of game player populations and/or structural characteristics will show certain

connections. The hope is that by taking a preliminary look at game structures in relation to addiction criteria, it may become clear whether or not game structures have any relationship to addicted players.

MMO games are massive graphical game worlds, wherein thousands of players continuously interact with one another in real-time. Gamers slay dragons, attract followers, and gather resources in worlds with complex politics, economies, and physics. MMO games attract millions of players worldwide. Although MMOs are a very new type of game, they already garner billions of dollars for the gaming industry. At least 28 new MMOs are scheduled for release in the next two years (Woodcock, 2005). Blizzard Entertainment's *World of Warcraft* is currently the most popular, boasting over 6 million subscribers worldwide (Jenkins, 2006). While *Warcraft* commands a huge market share compared to other MMOs, there is an increasingly steep incline in growth of total active players (Woodcock, 2005).

Some people play MMO games for 40, 60, even near 90 hours straight, and then die (Kim, 2006). Still, these may be anecdotal cases. It is speculated that most people can use computers for long periods of time without ill effect, while only a small few cannot remain "healthy" while doing so (Charlton, 2002). Nonetheless, if games appeal to a broad demographic (Yee, 2005, Griffiths, 2003), then this problem has the potential to affect an expansive demographic.

Understanding the potential for addiction in games requires that researchers use better materials and sampling methodologies. Defining populations as "addicted" is problematic, as most studies fail to describe even their basic criteria. The current work attempts to describe criteria on some key studies in Internet and computer addiction, as they form the

foundation underlying many studies of video game addiction. A previously tested and used definition of MMO addiction is then selected (Charlton & Danforth, 2004). In the theory used, players begin with stages of "high engagement;" they enjoy play yet experience only lower order negative effects associated with these games: cognitive salience, euphoria, and heightened tolerance. At a point, some gamers enter a stage of "addiction", experiencing more severe negative effects: behavioral salience, intra and interpersonal conflict, withdrawal, and relapse/reinstatement. That play degrades in this manner among certain players seems clear (Brown, 1997; Charlton, 2002). Less clear is what factors may prompt the move from enjoyable "engagement" to deleterious "addiction".

To this end, Wood and Griffiths et. al (2004) have suggested the importance of the structural characteristics of videogames. While their work does not explore MMO addiction, the notion of a game having inherent structures, even to the degree that different MMOs games may share certain structural traits, is central to this work. Structural characteristics in this paper are, then, meant to measure the perceived amounts of time spent at, frequency of interactions with, and perceived importance a game player puts on interaction with major generalizeable structures of the game world. For instance, whether they prefer adventuring with people they have met online, how much they value a certain type of player organization (guild), if they like to manipulate other players, or whether they want to sew pretty dresses. Within the literature, a number of structural characteristics are readily apparent, these being amount of time spent at different in-game activities (Wood, Griffiths, et. al, 2004), guild characteristics (Seay, Jerome et al., 2004; Jakobsson and Taylor, 2003), performance of socially unacceptable behaviors (Yee, 2006), level of interaction with real life friends versus

online friends (Jakobsson and Taylor, 2003), level of immersion (Yee, 2006), and level of individualism (Yee, 2006).

Again, at present no study has examined the relationship, if any, between addiction and the structural characteristics inherent to videogames. A number of oversights highlight the need for interdisciplinary research. Gameplay types and motivations that have been cited in psychological literature as destructively addictive are currently being observed in actual gaming populations within the fields of computer science, informatics, and communications. For example Nicholas Yee, studying MMO player behavior within the field of Communications, had determined "escapism" and "manipulation" (i.e. of other players) to be two major reasons to play (Yee, 2006). Meanwhile, in the field of psychology, at least one measure of Charlton's addiction scale deals with gaming as an "escape from socialization" (Charlton, 2002). Additionally "negative valence", or use of videogames to undergo non-socially acceptable behavior, relates strongly to addiction, and is very similar to Yee's measure of "manipulation" (Charlton & Danforth, 2004). Overlap does exist between addiction literature and reported behavior. No empirical data, however, yet explores links between addiction, and preferences towards, performance of, or frequency of performance of general structures within games.

While the gaming industry itself has given some treatment to the issue of addiction (Clark, 2006), it is unclear as to whether even game developers take the notion seriously (Adams, 2002). The gaming industry is nonetheless populated with a true mélange of development houses, publishers, independent contractors, and other actors. As is evidenced by the major industry publications, they place value on academic work. Gamasutra.com, for instance, lends theses, books, and other academic works valuable web real estate. Industry

leaders attend a wide variety of conferences on games. At the most recent game developer's conference (GDC), all manner of game creators flooded a talk given by three major academics discussing upcoming gaming research. While some game developers will certainly protest to discussions of game addiction, many more realize the necessity for understanding the intersect between videogames and addiction.

By comparing Charlton and Danforth's model of MMO addiction (2004), against structural characteristics identified in this research, it may be possible to determine which elements of play, if any, relate to addiction. If any relation exists, it would provide early data on which parts of a game relate most strongly to the preferences of addicted players. It is important to note here that a relationship between structural characteristics and addiction may suggest a number of things. A robust set of relationships between structural characteristics and addiction likely does not imply that games themselves are addictive, nor would it be able to imply that only game players with addictive personalities will have problems. An utter lack of any relationship may indicate that games themselves have no link to addiction. Nonetheless if relationships do exist, the hope would then be that the academy, the gaming industry or others will verify these results for themselves so as to understand why certain structural characteristics may be linked to harmful behaviors.

Chapter 1: Relevant Literature

The "newness" of games, relative to established media forms, makes analysis of structural elements quite recent. DFC Intelligence estimated that the top 17 video game companies collectively made 24.5$ billion USD in 2004, (Maragos, 2005) compared to the often cited six or seven billion overall value. MMO games represent a major force in the videogame industry. In China alone, MMO business was forecasted to grow from 580$ million USD in 2005, to 1.7$ billion in 2010 (Jenkins, 2005). A recent report by the IDC estimates South Korea's MMO revenues at 551$ million USD in 2004 (Reuters, 2005).

Each successive MMO is essentially different. For instance, *Star Wars Galaxies* occurs within George Lucas' famous *Star Wars* Galaxy, whereas Square Enix's *Final Fantasy XI* occurs within the established *Final Fantasy* universe. Each has their own different rules that dictate the play environment. Each are, however, very similar in certain structural characteristics, the theoretical pieces which make up the game world. That these games, and this line of inquiry is so new, studies of gaming populations could be compared to that of movie going, at a time when only a dozen or so major movies had been made. A number of authors, in conducting demographies, ethnographies, and other exploratory studies of MMO populations have examined what could be called structural characteristics (Wood, 2004; Ducheneaut, 2004; Jakobsson and Taylor, 2003; Seay, 2004; Delwiche, 2003). Building on the MMO structural characteristics pulled from their work and explained below, this study seeks to find whether videogame structural characteristics are related to concepts of addiction.

Figure 1. Sony Online Entertainment's Star Wars Galaxies brings to life elements from Lucas' proprietary world, such as Jedi and rancor beasts

It is also important to note that I, as the author, am connected to these videogames in such a way that this work is necessarily ethnographic in many respects. I am part of a generation that has grown up immersed in games, MMO games becoming a part of that for me upon joining some online friends in playing Star Wars Galaxies. Most recently I have been playing World of Warcraft. While this thesis centers on quantitative data, qualitative data is inseparable from this. While the ethnographically inclined researcher will no doubt want more in the way of direct quotes and nuanced situations, this thesis does center on quantitative data. My background will primarily show itself in discussions of MMO games. These discussions are intended for the audience of academics who may otherwise have had little experience with these worlds.

Addiction Literature

Much of the game addiction research being performed today owes its methods to the foundation laid by early work done in Internet addiction. Ivan Goldberg's joking 1995 inception of the "Internet Addiction Support Group" is generally credited with coining the phrase "Internet Addiction Disorder" (IAD) (Charlton & Danforth, 2004), and highlights the tone of the early dialogue on addiction. In the same year, a study of problematic videogame use among first year psychology students (Griffiths and Dancaster, 1995) was conducted using the DSM-III criteria for pathological gambling (American Psychiatric Association, 1987). The following year, "Internet Addiction" was introduced at the 1996 annual meeting of the American Psychological Association (Young, 2004). Numerous studies followed suit. Most of these studies used no more than ten items in diagnosing what they referred to as computer and Internet addictions. At most, affirmative answers on only 50% of these items were needed to fit operational definitions of addiction (Griffiths, 1999; Griffiths & Hunt, 1998; Scherer, 1997; Young, 1998). While Internet and computer addiction should be seen as entities distinct from videogame addiction, the former two are discussed as part of a genealogical progression of research. For better or for worse, a great deal of the research into videogames takes its measures and methodologies directly from these earlier works. In some ways this helped to bring the notion of videogame addiction to light, yet in others it introduced detrimental misconceptions. While it is possible that addiction to a game may be similar to Internet or computer addictions, should either actually exist, games are distinct from computer applications and the Internet. The goal of this addiction section is to trace the literature regarding non-substance addiction, examining its roots in Brown's model,

addiction's initial applications by Young in Internet dependence/addiction, then finally to Charlton's conceptions of engagement and addiction.

Despite the serious dearth of academic information regarding the relationship between games and addiction, gamers throw the term "addiction" about quite readily. Among game players it is colloquial to regard casual play as "addiction," regardless of whether a person's play is healthy or not. Prominent advertisements and reviews for games use the word "addiction" synonymously with "quality." Highlighting the pervasive use of the term as well as gamers' perceptions of addiction, one player asked to participate in this study noted that it was their first time playing in months. Later they stated, "but I was addicted like all the rest." Contacting another player inside the game provoked a strong negative reaction, at first. However, after the researcher apologized and left that player alone for a time, the same player began spontaneously talking about their play, "to make this short I no longer work and I play this game almost all day every day for over a year now." The sustained misuse of perceptions and stereotypes on the part of marketers will likely have an increasingly devastating impact on game players that do have problems. Understanding the intersect between addiction and videogames is a necessary precursor toward first, understanding what to regard as addiction, and second, search for clues as to how we might begin to help the people whose play is having a clearly negative affect on their lives.

Brown's Hedonic Management Model of Addiction

Iain Brown (1993; 1997) wrote a number of articles regarding his "hedonic management model of addiction," a model created to apply to non-substance addiction generally. In the most basic sense, Brown argues that all people use certain activities to

make themselves feel good. Some people, whether through gradual development, or the sudden discovery of a very powerful stimulus, learn to use this one stimulus to keep themselves feeling good all the time, increasingly at the cost of their long term goals. Recovery is a matter of regaining a normal repertoire of activities and realization of an improved long-term rate of reward. Brown additionally distinguishes addiction as value-free, which means that though an activity has acquired a "motivational monopoly" (Hodge, p. 34) within an individual, it is rarely without benefit. Two obvious examples would be addiction to jogging or to computer games, possible benefits being physical health and technical knowledge, respectively.

Neuroscience

Without belaboring Neuroscience, it remains important to give at least a sideways glance toward the established role of dopamine in the brain, and how neurological veins of research may lend greater understanding to MMO addiction. Where Brown's psychological studies suggested that "non-substance ingesting …activities" could create behaviors very similar to those found in substance-addicts (Brown, 1991), meaning that a strongly psychological concept likely underlies both substance, and non-substance addiction. Goal-oriented motivation is based on two major factors, "the availability of reward, and the effort required to obtain it…" (Depue and Collins, 1999). Brown reflects this, in saying:

> "An addiction develops its maximum power and momentum through the prolonged action of several positive feedback loops. These positive feedback loops begin with a series of cognitive failures which lead to the strengthening of an acquired drive for particular feeling states as a goal associated with the performance of the addictive activity. As the acquired

> drive strengthens, so the single activity becomes more and more salient as almost the sole source of reward." (Brown, in Hodge, 1997, P. 29)

Considering that MMO games contain nearly pervasive reward, with such rewards immensely easier to obtain relative to RL (The most common abbreviation for "real life" within a MMO game) goals and rewards, it is then not entirely unreasonable to expect many players to experience greater apathy toward RL goals, as they are not only overshadowed by much more transparent and apparently efficant goals (i.e. slaying a dragon, or crafting a weapon yet unseen on a particular server), but that in-game goals themselves take such an amount of time as to make RL goals all the more difficult to obtain. Here the "availability of reward" and "effort required to obtain it" reflect Brown's concept of "hedonic gap", the difference between the strength of a goal, and personal susceptibility. Depue and Collins state that individual differences in dopamine processing can predetermine certain individuals as more likely to develop addictive behaviors. In this way, hard science and Brown's model both seem to be pieces of a larger puzzle.

Internet Addiction

As recently as 1996, Internet addiction was brought up as a potential disorder among mental health professionals. Criteria for "Internet Dependence" was made to be based off of the DSM-IV, the American Diagnostics and Statistical Manual for Mental Disorders' criteria for problematic gambling (American Psychological Association, 1994; Young, 1996), provided as Appendix D. As seen in Appendix E, the "Diagnostic Questionnaire" forwarded by Young used eight criteria, rather than ten, yet maintains a cutoff of five affirmative responses in order to define "dependents" as Internet-addicted. While she defends five of

eight as a "rigorous cutoff," she does state that "It should be noted that while this scale provides a workable measure of Internet addiction, further study is needed to determine its construct validity and clinical utility." (Young, 1996).

More recent versions of her diagnostic questionnaire for Internet addiction are larger, and scaling. For instance currently, her website offers a 20 item questionnaire, scaling from 20-100 points. It segregates Internet use into three categories, causing: no real problems, some problems, or significant problems. Charlton (2002) has suggested that checklist-type questionnaires are likely to overestimate the number of people addicted, and has otherwise questioned her work. That she provides no real theoretical framework is troubling, especially considering that so many studies, be they for Internet, computer, or even gaming addiction, have imported her framework verbatim into their studies.

Engagement and Addiction

Though this conception of Internet addiction is likely to overestimate the number of individuals who require clinical help (Charlton & Danforth, 2004), it was the first attempt at forging criteria for over-use. Brown's six criteria, covered later, have been used by Mark Griffiths, another psychologist active in the field of computer, Internet, and even video game effects. But what of claims that videogame playing lends itself to learning skills which can prove beneficial in the contemporary marketplace? John Charlton makes an attempt at determining whether his concept of "high computer engagement", merely enjoying a large amount of computing, relates to Brown's framework of addiction. More specifically, do any of Brown's six criteria relate to a non-pathological enjoyment, while others relate to a more deleterious addiction?

Brown and Charlton

Though Brown does present his model in layers, meaning that certain activities are by nature more destructive, Charlton's factor analysis allows us to see which layers are in actuality most destructive in terms of computer use (Charlton, 2002). This is especially relevant when computers act as an almost necessary gateway to jobs, communication, and regular leisure for many people. Charlton found moderately high use to relate to the less harmful of Brown's elements, which he calls "engaging" qualities. These include tolerance, euphoria, and cognitive salience (thinking about an activity a lot). The "addictive" qualities are behavioral salience (engaging in the activity a lot), conflict (arguments within yourself and with others over the extent of your usage), withdrawal, and relapse/reinstatement.

Engagement and Addiction in MMO Play

Charlton's method has been applied to Massively Multiplayer Online games, with additional factors having been found to relate to the concept of "addiction" (Charlton& Danforth, 2004). The three additional factors are "negative valence" (a respondent's indulgence in societally unvalued activities), "attractiveness" (whether a respondent perceives themselves as attractive), and "emotional stability". The specific questions used to survey MMO gamers are provided in Appendix B, Part Two: Personality/Gaming Behavior.

Player Populations and Structural Characteristics of MMO games

While we may not know a great deal about addiction as it relates to these games, there has nonetheless been a great deal of work exploring these worlds. The methods of these studies may not be perfect, yet they nonetheless give strong hints as to who is playing and why. Even if many demographic variables have yet to be sampled scientifically, what

exists can be compared against information on addiction in order to garner information regarding these worlds.

Figure 2. Blizzard Entertainment's World of Warcraft

Each MMO, for instance *EverQuest* or *World of Warcraft*, is a different game, with different mechanics. Within games there can be large differences as well, as each game will, on average run one, 20, or even 100+ servers, depending on the popularity. Blizzard's *World of Warcraft*, currently the real world's largest MMO, runs at least 108 servers, which they call "realms." This number increases as *World of Warcraft* gains popularity, yet may collapse if newer games grow in favor. A server is a single copy of the game world, with its own internal mechanics; likely variations between servers are community, economy, or nationality. To be more specific, after purchasing an MMO and creating a billing account, one will have to choose which particular "server" of this game world they would like to play in. The bulk of player population studies do not explicitly explain how they treat sampling

with regard to servers or games, though this is not the major downfall to such studies so far. A major sampling downfall is that the bulk of studies looking at player populations have been elicited through outside websites, particularly "community websites" for particular games. Two major concerns with this are (1) the sheer volume of such popular community websites, and (2) the low likelihood that those seeking community outside the game will be representative of those playing within (especially those pathologically addicted).

Structural Characteristics as a Theoretical Concept

Though literature pertaining to videogames is growing rapidly, few have stopped to actually define videogames or analyze their structure (Wood, Griffiths, et al., 2004). In a study of more traditional single-player games, Wood et al. set out to assess video game structure by way of asking which structural characteristics were most salient among game players (Wood et al., 2004). Many of his structural characteristics were not entirely applicable to MMO play, for instance 'duration of game' and 'mapping' (creating custom levels for a single player game). Other characteristics apply to MMO games, such as interface options, use of humor, and brand assurance, yet were omitted from this study in order to restrict its size.

Figure 3. Structural characteristics map the structures available for interaction within these games, and include exploring new areas.

Yee's MMO Motivations

Nicholas Yee, one of the more recognizable names in the study of MMO effects, in a 3 year period surveyed over 30,000 players from the MMO games *Ultima Online*, *EverQuest*, *Dark Age of Camelot*, and *Star Wars Galaxies*. In a paper set to be published in 2006, he explores positive and negative effects of MMO playing. Qualitatively, Yee identified five factors of MMO motivation: achievement, relationship, immersion, escapism, and manipulation.

It is important to differentiate motivations for play from structural characteristics, the actual structure within the game that is being manipulated. This distinction notwithstanding, the criteria used by Yee can be modified and clarified so that these motivations may be measured as if they were structural characteristics. For instance, Yee's concept of

manipulation includes the questions, “I scam other people out of their money or equipment”, and, “I like to taunt or annoy other players.” His questions do not have to be changed drastically for a successful query of MMO structures.

The wording of some measures taken from Yee remain unchanged. In “immersion”, for example, creating a back-story for one’s character can be entirely in the mind of the game player, or it can be an integral part of the game. *Eve Online* and *City of Heroes* are two games where players are encouraged to enter information about their character’s history, in a structure that allows other players to then read that information and/or back-story. *World of Warcraft* has no structure for this, but it is not uncommon to hear a player talking about their created back-story on an RP, or role-playing server. The same structure is here operating in radically different ways, sometimes even within a single game.

Demographics of MMO game players

What we know about gaming comes primarily from Yee’s studies, particularly his Daedalus Project. While nearly all of the information collected by Yee came by way of self-selected respondents seeking out his surveys, the many thousands of people attracted for his studies have made his data likely the most widely cited in academic work on game player demographics. In terms of employment, 50.0% of respondents were shown to work full time, 22.2% were full-time students, and 13% of female players referred to themselves as “homemaker.” Additionally, the number of female MMO players seems to increase with age, surpassing the number of males in the 23-28 age range, and in each subsequent age range (Yee, 2006). Yee argues that this data dispels the notion that all gamer players are unemployed, male, and young; rather games have a universal appeal.

Other findings from Yee are that 60.9% of respondents had played for at least 10 contiguous hours, this effect being roughly equivalent along age groups. 15.8% of men and 59.8% of women play MMOs with a romantic partner, while 25.5% of men and 39.5% of women play with a family member, suggesting that women are primarily being introduced to MMO games by a spouse or family member. Most importantly, Yee points out, "…the data demonstrate that MMORPGs appeal to a very wide demographic and that this appeal is strong and elicits high time investment from users." (Yee, 2006).

Comparing the Social Networks within MMOs with those of the Mafia

> "…the mafia initially grew out of an ancient honor system where elders were entrusted to negotiate in conflicts and pass judgments that the others were obliged to adhere to. The fact that Sicily historically has been targeted by outside interests such as the Spanish and fascists has also contributed to a need for organized resistance against outside oppression. The transition into a criminal organization came later, possibly more or less because the mafia realized that they could use their powerful organization to achieve fortune for themselves. This pattern is repeated in EQ [*EverQuest*]. The strong emphasis on reputation in the creation of social networks grows out of a need from the players to self-govern their gaming environment in order to secure a positive experience in the presence of potential disturbances and a simultaneous absence of an effective and reliable governing system. But ultimately these networks are also used to take shortcuts through, or trick, the formal rules of the system." (Jakobsson & Taylor, 2003)

Comparing *EverQuest*'s prominent framework for social structure, the guild, to the social structure of the mafia should seem laughable at first. The above quote however illustrates and contextualizes ways in which play style shifts strongly within MMO games,

favoring these social networks as players approach the highest levels of in-game achievement. Put another way, where a player's guild, online friends, and real-life connections at early stages of play provided the support required to succeed, at the end-game they become the connections that allow a player to dominate.

Figure 4. The members of both social and goal-oriented guilds will occasionally line up for group photographs.

Here it begins to become apparent that Yee's (2006) conceptions that deal with interaction (how much a person talks, shares feelings, etc.) and perhaps also individualism, a person's preference toward playing on their own, may need to be expanded. In the mafia, family provides a strong foundation for commitment. You stick with your family, and they stick with you. Jakobsson and Taylor are here arguing that MMO games work similarly, where people who know each other outside of the game have a much higher commitment to each other than to friends that they know strictly through the game. The idea here was then

to split up communication between these two types of connections; real-life friend, and strictly online friend (individuals or guildmates), and then to rework these criteria in order to better reflect levels of interaction. Individualism was expanded from Yee's group/solo criteria in part due to this emphasis on interaction. If some players prefer playing with real-life friends, and others with online friends, then perhaps those that prefer no interaction at all differ in equally significant ways.

Project Massive and Guild Communication

The self-effacingly named Project Massive sampled from five MMO games in order to "investigate how players play, communicate, and organize." Tracking players via guilds, the study reinforced what many others have said: that the social experience is key to MMO play. The study surveyed the various forms of communication and meta-communication surrounding each MMO. They additionally found that guild membership, especially to large guilds, was seen as essential to many players. On average, guilds were found to "raid" (spend a few hours killing specific monsters together) 1-2 times per week (Seay et al., 2004). While this is a reasonable median estimate, guilds may raid far more or less, depending on the type of guild, and the amount of raid content available within the game sampled. It is not uncommon for a very serious raid guild to raid seven days a week, and expect members to attend. This is staggering when one considers the time commitment required for just one raid. More information on raiding is given in the section on "The Endgame."

Mowday's organizational commitment questionnaire (OCQ) was administered to guild members, finding no significant difference between guilds. This may be because all guild members are equally committed to their guilds; yet the large differences in size, level,

connections, and members between guilds make the conclusions of project massive highly unlikely. It is more likely that the OCQ was applied to significant elements of the MMO game, or that insufficiently rigorous sampling did not query from a diverse enough pool of guilds. Seay forewards a model whereby guild commitment and guild meta-game communication reciprocally buffet one another then suggests a high importance of communication in gameplay. This model is useful in that it brings meta-game communication to our attention, yet attributing commitment too strongly to meta-game communications is a mistake. If any statement can be made about guild communication, it would be that it is complex.

Social and "Uber Raiding" Guilds

Jakobsson and Taylor find two major types of guilds: social and uber raiding. Uber raiding is a type of guild which very frequently performs tasks requiring extensive skill, preparation, and other goal-oriented action on the part of their members. Within the guilds' social hierarchy there are three major factors. First, reputation becomes important. Second, trust is major factor. Certain players are put in charge of not only the equipment of an entire guild, but their very (secondary) lives, as account sharing (giving someone access to your entire avatar) occurs very frequently in some MMOs, guilds, or social networks. Account sharing is officially illegal in nearly every major MMO, though Jakobsson and Taylor found that the reputation of many uber raiding guilds put them 'above the law.'

The third factor is responsibility: "Drop everything and get to the raid." (Jakobsson and Taylor, 2003). While the dual pertinence and humor of this statement would is easily lost on most newbs (traditional slang for gaming newbie or neophyte), members of high-end

guilds are often expected to put their RL and in-game lives immediately on hold for three, four, even seven to nine hours at a time, at least once per week, in order to complete complex in-game end-game tasks, dungeons, and unique encounters. Additionally, many other players have commented that having uber guilds swarm specific "mobs" (an accepted MMO slang for mobile objects or monsters) often means that players who are not in an uber raid guild have virtually no chance to get the coveted items that "drop" (are looted from the monster once it has been dispatched).

The Endgame

"The production of social networks and the circulation of social capital proves to be one of the most important aspects of EQ." (Jakobsson and Taylor, 2003). *Dark Age of Camelot*, another popular MMO, refined their social systems through a public ranking system. *World of Warcraft* added a similar PvP (killing other players) "Honor" system into the game, rewards for players being weapons, armor, transportation, and access to special areas. This is just one way that design of structural characteristics can affect play, in ways that affect even community. Most importantly here, is that Jakobsson and Taylor contend that social network design is the ultimate end-game structural characteristic. This makes a lot of sense. Once you no longer need to work to get "experience" (your character is of the highest achievement level possible), the only way to advance your character is by obtaining "epic" gear/items or reputation. Reputation and items often buffet one another. Epic items are more powerful than those obtainable by most players, but require excessive work to acquire. The main way to obtain these epic items is by killing "epic" monsters, which requires the repeated help of 4-200+ other human players, for 3-12 hours, depending on the

MMO. Some games are without robust items hierarchies, yet even in these design is not without its consequences for social structures and reputation.

Envisioning Raid Dungeons

To further contextualize social capital and social networks, *World of Warcraft* features "instances" (private dungeons containing epic monsters) that require 40 players to simultaneously group together in order to kill endgame/epic monsters. For example, Onyxia is a dragon who is relatively easy to defeat for experienced players. A number of quests, however, are required before one is even allowed access to the Onyxia dungeon. The total buildup requires between 15 and 60 hours, depending on the skill and cohesiveness of the groups a player will inevitably need. It took this author at least a month of part-time play in order to obtain the Onyxia "key." On another character, however, it took little more than a week of casual play. After "keying up", members of relatively high-end guilds in Warcraft may "run" (attempt a dungeon) Onyxia about once every week. Occasionally, players of sufficient reputation may be invited to kill Onyxia as part of a PUG (pick up group). Some guilds, at the very high end, have already obtained all of the "epic" items that they need or want from Onyxia and related dungeons, and have thus graduated to even more complex and involved dungeons. In Blizzard's *World of Warcraft*, learning how new dungeons work is time consuming, expensive, tactically challenging, and generally requires players to be "geared," that is to say that they must have obtained most, if not all of the "epic" items available in easier dungeons or within their game world.

Figure 5. As many as 40 human players will join "raid groups" in Blizzard Entertainment's World of Warcraft, playing together for hours in order to defeat difficult enemies in complicated battles.

The Molten Core (MC) is another dungeon within *World of Warcraft*, and is considered fairly difficult. Blizzard allows seven days for a group to complete MC, and 40 (the maximum amount allowed in a group) top level characters are almost always needed, all of which have to be able to work together if they hope to reach the end (Thottbott.com, 2005). There are ten bosses, each which drop two to three random "epic" items. Not counting random drops from "trash mobs," monsters encountered in between boss fights, this is 20-30 items total that must be split between 40 people over the course of at least three hours. Generally MC takes at least five hours. At times groups will experience "wipes," failures which prolong the adventure.

Each player can equip about 15 items, from pants and rings to swords and shields, and some may have already received the goods that "drop" from the bosses within the Molten Core. In just one example of guild complexity, many guilds have "point systems" in order to decide who has shown enough commitment to the guild to deserve such coveted reward. There are different names for these point systems, but the most common is DKP, which usually stands for dragon kill points. There are a number of DKP or "loot" systems, ranging between esoteric "loot councils," to complicated formulae for calculating DKP. It seems that almost every guild will have their own unique DKP nuances. In some cases, a player's decision of what kind of guild to join can be heavily influenced by loot systems. Reputations and/or guilds can crumble when members loot improperly. It is not surprising to hear that players who have just a few epic items, and not even a full 15 basic epic items have often played in excess of 35 days [35 x 24 hours] (Bunch, personal interviews).

The Importance of Social Interactivity

Ducheneaut and Moore, in the Social Side of Gaming, suggest that interactivity is affected by game structure. That is, games can be and are crafted in order to promote high levels of interactivity between players. One head designer for the popular MMO *The Sims*, developed by Maxis and released by Electronic Arts, noted that the focus of the game is community building. *Star Wars Galaxies* is designed and structured for forced interaction between professions. Ducheneaut and Moore note that social experiences "can greatly increase appeal and longevity," and can even create structural characteristics that are superior to developer-programmed elements (Ducheneaut and Moore, 2004). They go on to say of *Star Wars Galaxies*, "The interdependencies between players are even deeper and broader: a

complex ecology of professions forms the basis of an economic system where players must cooperate and exchange goods and services, as they would not be able to progress otherwise." In a system which literally bases itself around the interactions that develop as a result of the game's structure, any analysis of this game requires taking into account server differences, or anomalies/inconsistencies created by players of each instance.

Variations in Endgame and the Jedi Grind

Ducheneaut and Moore (2004) examined two major public spaces in the virtual world of *Star Wars Galaxies*. In one, the "Cantina", they found that only 2% of players were present over 50% of the time. While Sony's *Galaxies* is structured toward promoting player interaction, here we find a large number of players cutting corners by "running macros", programs that perform game actions while a player is away. Not that the creation of these macros is too complex as to restrict it from casual players, but at the time when the study was conducted, "macro grinding" ("to grind" is to perform the same action over and over, very quickly, in order to advance a character as fast as possible) was taking place for the purpose of a "Jedi grind." Completing this endgame goal at the time of Ducheneaut and Moore's writing would provide a "Jedi slot," allowing a player to play the game as a Jedi, ala Mark Hamill or Ewan McGregor. In short, players were circumventing the designed interaction (by using macros) in order to get a Jedi with as little effort as possible. While the structure of this high-end system within *Galaxies* has changed **dramatically** since this study, it remains that sensitivity to high-end goals, those most likely to be pursued by "highly engaged" or "addicted" players can shed light on otherwise anachronistic situations.

Ducheneaut and Moore contend that the lack of incentive for non-instrumental communication is the major downfall to Sony's design here. Beyond incentives, power players at the time of their study were able to create more than one character, "grind" them to the maximum level of dancer/musician, then place them in the cantina of their choice in order to glean the benefits of those two professions. No interaction necessary. In this way, Sony's interaction is avoided, and entire guilds are able to "buff" (obtain the benefits of a dancer/musician) themselves and move more quickly to their endgame goals.

Methodologies used to Sample Gamers

While this study did not use data explicitly from in-game sampling, the reasons for this being discussed later, one of the major aims of this thesis was to make the case for improved sampling of MMO games. Heretofore, many studies of MMO games used samples of college freshman enrolled in introductory psychology courses, content analysis of novelty questionnaires, and self-selected samples: samples being advertised through word of mouth, websites, forum posting, and guild forum posting. Nick Yee's most recent use of *World of Warcraft's* user interface (UI) in order to collect large amounts of data is an exciting break from this long trend. While there is a large amount of data that his method cannot tell us, it is nonetheless a creative leap forward to the end of improving sampling.

The differences between just MMO servers make a strong case for improving sampling methodologies. These differences are detailed in this section, and should give insight as to why the status quo is very likely to provide insufficient data. Five *major* differences between servers that studies must account for are size of server, preference for roleplaying, preference for PvP combat, guilds present, and economy. While studies might

be tempted to weight servers, there is a preponderance of conflicting, frequently changing, and often unreliable data as to how large each server actually is. This study favored simple stratification, with consideration given to any themed servers (such as PvP or roleplaying) missed by this process. Nearly every study done so far gives no mention as to how they handle servers, or the differences implied. Treatment of servers must be included in MMO research.

It is possible that an unsampled server would have a unique type of guild or economy. While the current work has no remedy for this possibility, save for sampling every server present for a given game, there are certain limitations programmed into an economy or guild's functionality. These problems join miscellaneous factors as other unexpected variations that might occur within a particular MMO game server. One example may be a vibrant black market within a *particular Star Wars Galaxies* server. Players with appropriate connections actually were, on one server, able to obtain items otherwise unknown or extinct on other servers. The black market vendors possessed items so powerful that even the game developers had made efforts to remove them from circulation. Such "wildcards" are certainly possible, and attempts to compensate for them may significantly improve data meant to apply to MMO games generally.

With MMO games that feature more than one "faction" (major player deviation), equal amounts of players would ideally be sampled from each "faction." In *World of Warcraft*, for instance, players have the choice of whether they would like to play with the "Horde" or "Alliance" faction. Once this choice is made, many players are restricted to one of the two sides, each side having interdependent economies, guilds, and even reward systems. *Warcraft*, *Dark Age of Camelot*, and some other games go so far as to make it

impossible for opposing faction members to speak with one another within the game, this having some major implications for the ease with which these games are researched. As these factional choices make important differences in the type of structural characteristics experienced, reflective numbers of each must be sampled. In some servers, there are vastly larger populations of one faction. While researchers may default to sampling even numbers of players from each faction, sampling an *n* of players that reflects their relative numbers would be superior. Doing so would however, as was mentioned earlier, require better uniform data on MMO games than is currently available.

As endgame experiences are dictated strongly by guild engagement (Jakobsson and Taylor, 2003), guilds need to be taken into account in order to ensure that a single server's sample was not dominated by a single guild. While taking this precaution can help to reduce problems with data in general, it additionally ensured that this survey's questions regarding guild preference were not influenced by a single large guild. Each server generally has at least a few dozen major guilds.

The Prototypical Nature of Games

It has been suggested by some scholars that what we learn about prototypical MMO worlds may help us to understand oftentimes elusive "Earthly" social problems, from the mundane to the tantamount. Edward Castranova (2003) discusses MMO economics as interacting with world economics, and also as perhaps reflecting them.

> "It should be possible to generate fairly simple theories and arguments explaining why things do seem somewhat different in virtual economies than they do in the Earth economy. As those arguments are made, we will learn more about the things that are the same in all economies,

> both virtual and Earthly: the true nature of human motivation and well-being, and their true relationship to objects in the immediate physical world." (Castranova, 2003).

Castranova additionally discusses the use of MMO technology for otherwise impossible experiments. "Unlike any other social science research technology, such games provide for both sufficient participation numbers and careful control of experimental conditions, making them like Petri dishes for social science." (Castranova, 2006). As we grow to understand addiction to gaming, in economics or in any of the other earthly fields, the prototypical nature of MMO games may distinguish them as vehicles for powerful research.

Conclusion

When neuroscience is compared against Brown's view that certain behaviors monopolize an addict's life, two things will become clear. First, certain people are more susceptible to addictions. Second, the more any reward cycle is performed, the more it becomes stamped in. If specific activities, or structural characteristics, offer rewards that are both easy to perform and effective, then over time such structural characteristics could stamp in dopamine dependencies. Structural characteristics may build addiction. The second part of this literature review has discussed a number of structures identified as existent in MMO games: in game activities, guild preference, behaviors not socially appropriate in everyday life, frequency of interaction with either real life or online friends, immersion, and escapism.

Chapter 2: Research Questions and Hypotheses

Concepts

Addiction Level

Conceptual definition. Using Brown's criteria for addiction, Charlton isolated behaviors that most relate to Internet addiction and separated them into two types. "High engagement" involves heavy play, with some mild signs of overuse. "Addiction" combines the signs of "high engagement" with more harmful marks of overuse. As discussed in the literature review, the signs of high engagement include cognitive salience, euphoria, and tolerance. Signs of addiction include those found in high engagement, but add behavioral salience, conflict (intra and interpersonal), withdrawal, and relapse/reinstatement. Danforth later applied these high engagement and addiction behaviors to MMO game use. This study uses Charlton and Danforth's (2004) 29 item questionnaire, modifying their scoring slightly in order to establish a relative level of addiction.

Operational definition. Respondents will be administered Charlton and Danforth's 29 item questionnaire, which will be scored on a five-point Likert-type scale. Answer choices range from "Strongly disagree," to "Strongly agree." Some questions are reverse coded. Two sample questions follow as they are written in the survey (included as Appendix B).

- I get a buzz of excitement while playing (MMO name – e.g. "EverQuest"),
- I have been late for engagements because of (MMO name – e.g. "EverQuest")

Perceived Time Spent at Different In-game Activities

Conceptual definition. This concept will use composite numbers to represent respondents' results for the following five concepts; perceived time spent at non-advancing gameplay, perceived time spent at non-combat character advancement, perceived time spent at combat character advancement, perceived time spent at endgame advancement, and perceived time spent at PvP combat.

Operational definition. Each of the following five concepts involve the answering of questions on a five-point Likert-type scale. These scores will range between one to five, one representing "A very small amount of time," two representing "A small amount of time," three representing "Neither a small nor a large amount of time," four representing "A large amount of time," and five representing "A very large amount of time."

Perceived Time Spent at Non-advancing Gameplay

Conceptual definition. In MMO gameplay, there are numerous activities that are not associated with any of the game's major goals. Essentially this asks: 'how much time do they spend at ends that do not directly or measurably grow their skills or incur direct benefit?'

Operational definition. Respondents will be asked to rate their own level of play at these structural characteristics that do not advance their character in any measurable way. Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "A very small amount of time," two representing "A small amount of time," three representing "Neither a small nor a large amount of time," four representing "A large amount of time," and five representing "A very large amount of time." Two sample questions follow as they are written in the survey (included as Appendix B).

- Taking time to find (MMO name – e.g. "EverQuest")'s Easter eggs (hidden/for-fun features)
- Taking screen shots of (MMO name – e.g. "EverQuest") scenery/architecture

Perceived Time Spent at Non-Combat Character Advancement

Conceptual definition. In MMO gameplay, a player may elect to advance their characters by building skills that do not directly relate to combat. Some MMOs are purely combat based, and almost all include combat as a central element. For certain players, however, the crafting of goods is a central, enjoyable element.

Operational definition. Respondents will be asked to rate their own level of play at these structural characteristics that advance their character's skills in ways that are not inherently combat-related. These skills can be, however, and are frequently do, feed into combat abilities. Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "A very small amount of time," two representing "A small amount of time," three representing "Neither a small nor a large amount of time," four representing "A large amount of time," and five representing "A very large amount of time." Two sample questions follow as they are written in the survey (included as Appendix B).

- Making Money
- Acquiring resources or components

Perceived Time Spent at Combat Character Advancement

Conceptual definition. The major structural characteristic to MMO play is combat. In most casual players, this involves advancing a character a number of skill levels, or levels.

In some players, it involves reaching the maximum level, or a threshold whereupon Endgame content is available. This concept measures the combat skill advancement from start, to that maximum level or threshold.

Operational definition. Respondents will be asked to rate their own level of play at advancement of combat ability, levels, and/or skills as a structural characteristic. These skills are usually a central component to a successful MMO. Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "A very small amount of time," two representing "A small amount of time," three representing "Neither a small nor a large amount of time," four representing "A large amount of time," and five representing "A very large amount of time." Two sample questions follow as they are written in the survey (included as Appendix B).

- Acquiring items that improve your combat ability
- Completing quests in order to gain experience

Perceived Time Spent at Endgame Advancement

Conceptual definition. Once an MMO game player has advanced their character to the maximum level, or reached that threshold where endgame combat and/or non-combat goals are appropriate, they may elect to continue advancing. This structural characteristic generally requires large investments of time in the other categories.

Operational definition. Respondents will be asked questions that ask the amount of time which they have spent performing tasks that can only occur at the endgame of MMO games Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "A very small amount of time," two representing "A small

amount of time," three representing "Neither a small nor a large amount of time," four representing "A large amount of time," and five representing "A very large amount of time." Two sample questions follow as they are written in the survey (included as Appendix B).

- Acquiring a form of endgame transportation (for example, Epic Mount in World of Warcraft, or AV-21 Landspeeder in Star Wars Galaxies).
- Gaining access to special endgame dungeons or areas by way of acquiring reputation, special keys, or any other special access

Perceived Time Spent at Player Versus Player (PvP) Combat

Conceptual definition. PvP is the idea of fighting another human player. Most popular MMOs involve some element of PvP combat, and acquiring the right gear for the right fight can be a daunting task. There are a number of settings where PvP is allowed, disallowed, or where PvP rewards may be heightened. For some players of popular MMO games, PvP superiority is a central driving goal.

Operational definition. Respondents will be asked gauging the amount of time spent fighting other human players. This can involve acquiring items specifically for the purposes of fighting players, fighting for honor or standing, or preference for specific player versus player fighting venues. Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "A very small amount of time," two representing "A small amount of time," three representing "Neither a small nor a large amount of time," four representing "A large amount of time," and five representing "A very large amount of time." Two sample questions follow as they are written in the survey (included as Appendix B).

- Acquiring special items, or "drops" specifically for the purposes of PvP
- Dueling other players of the same or opposing faction

Importance of Guild Goal-Directedness

Conceptual definition. Seay, 2004, found that numerous MMO players noted the importance of guilds. Jakobsson and Taylor noted that of the two types of guilds, social and "uber raid", uber raid guilds required frequent and extensive goal-oriented action on the part of their members. This concept seeks to describe "uber raiding" guilds as goal-oriented.

Operational definition. Respondents will be asked a number of questions that ask whether they feel a number of goal-oriented guild characteristics are important. Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "Very unimportant," two representing "Unimportant," three representing "Neither unimportant nor important," four representing "Important," and five representing "Very important." Two sample questions follow as they are written in the survey (included as Appendix B).

- Number of maximum level players in the guild
- Frequent guild raids, dungeon attacks, or mob swarms

Importance of Guild Sociability

Conceptual definition. Jakobsson and Taylor note that the second type of guild, social, have the focus of their guild less on goal-oriented gameplay, and more on sociability, and whether or not the members are likeable, supportive, or enjoyable.

Operational definition. Respondents will be asked a number of questions that ask whether they feel a number of social guild characteristics are important. Each question will

be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "Very unimportant," two representing "Unimportant," three representing "Neither unimportant nor important," four representing "Important," and five representing "Very important." Two sample questions follow as they are written in the survey (included as Appendix B).

- That my guild has entertaining, humorous, or exciting conversations
- That my guildmates (fellow guild members) respect me as a person

Perceived In-game Frequency of Behaviors that are Socially Unacceptable in Real Life

Conceptual definition. Yee, 2006, in qualitative analysis of MMO player motivations, found that one major motivation for playing was that these worlds provided a venue where socially deviant, or socially unacceptable behaviors could be played out relatively consequence-free.

Operational definition. Respondents will be asked direct questions regarding how often they feel that the performance of these socially deviant, or socially unacceptable behaviors is acceptable. Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "Very infrequent," two representing "Infrequent," three representing "Neither infrequent nor frequent," four representing "Frequent," and five representing "Very frequent." Two sample questions follow as they are written in the survey (included as Appendix B).

- "Ninja loot", or taking items which you do not need, or from "mobs" which you did not kill
- Verbally harass other players

Frequency of Interaction in-game with RL (Real Life) Friends

Conceptual definition. How often a player interacts with someone whom they know in real life. Different forms of interaction queried include time spent playing with real life friends, time spent having conversations, and social support.

Operational definition. Respondents will be asked how often certain types of interaction with real life friends occurs in-game. Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "Very infrequent," two representing "Infrequent," three representing "Neither infrequent nor frequent," four representing "Frequent," and five representing "Very frequent." Two sample questions follow as they are written in the survey (included as Appendix B).

- Spend time playing with their characters
- You have a meaningful conversation

Frequency of Interaction in-game with Online Friends or Guildmates

Conceptual definition. How often a player interacts with someone whom they do not know in real life. Different forms of interaction queried include time spent playing with online friends or guildmates, time spent having conversations, and social support.

Operational definition. Respondents will be asked how often interaction between themselves and online friends or guildmates occur in-game. Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "Very infrequent," two representing "Infrequent," three representing "Neither infrequent nor frequent," four representing "Frequent," and five representing "Very frequent." Two sample questions follow as they are written in the survey (included as Appendix B).

- You have a less than meaningful conversation
- They offer up support for a real life problem

Level of Immersion

Conceptual definition. Immersion is a player's ability to naturalize themselves in a world of fantasy and roleplay. Immersion has been noted as significant by a number of scholars, but these criteria used here were originally developed by Nick Yee, for use in a number of his projects.

Operational definition. A player's level of immersion is being measured here by their relative agreement or disagreement with a number of statements that have been linked to immersion. Each question will be scaled on a five-point Likert-type scale. The answers range from one to five, one representing "Strongly disagree," two representing "disagree," three representing "Neither disagree nor agree," four representing "Agree," and five representing "Strongly agree." Two sample questions follow as they are written in the survey (included as Appendix B).

- I try new roles and personalities with my characters
- The fantasy setting of (MMO name – e.g. "EverQuest") is very appealing

Level of Individualism

Conceptual definition. Individualism measures the relative level of independence, or dependence of a player on other players. Certain character types advance more easily if in a group with others. These criteria were originally developed by Nick Yee.

Operational definition. A player's level of individualism is being measured here by their relative agreement or disagreement with a number of statements that have been linked

to individualism. Each question will be scaled on a five-point Likert-type scale. The answers will range from one to five, one representing "Strongly disagree," two representing "disagree," three representing "Neither disagree nor agree," four representing "Agree," and five representing "Strongly agree." Two sample questions follow as they are written in the survey (included as Appendix B).

- I play solo (by myself) more than I play in a group
- I help players that are in trouble only when it won't inconvenience me at all

Specific MMO Game

Conceptual definition. The specific MMO game for which a player is filling out the survey. For instance, if they are filling out the survey for the MMO *Star Wars Galaxies*, then the specific MMO game will be *Star Wars Galaxies*.

Operational definition. This measure will separate or survey responses by MMO. The specific MMO games counted will include "*World of Warcraft*," published by Blizzard Entertainment, and "*Star Wars Galaxies,*" published by Sony Online Entertainment, *EverQuest 1 and 2*, released by Sony Online Entertainment, *City of Villains*, developed by Cryptic Studios, *Dark Age of Camelot*, developed by Mythic Studios, *Ultima Online*, developed by Electronic Arts, and *Final Fantasy XI*, developed by Square Enix.

Research Questions

The amount of time spent at certain specific activities in-game, or structural characteristics, may play a part in either engagement or addiction. By linking these to the actual structure (structural characteristics) they refer to within the game we can query one structure's salience relative to others.

RQ1: What is the relationship between the perceived time spent at different in-game activities, and addiction level?

A) What is the relationship between the perceived time spent at non-advancing gameplay and addiction level?

B) What is the relationship between the perceived time spent at non-combat character advancement and addiction level?

C) What is the relationship between the perceived time spent at combat character advancement and addiction level?

D) What is the relationship between the perceived time spent at endgame advancement and addiction level?

E) What is the relationship between the perceived time spent at player versus player

Seay, Jerome et al., 2004 and Deuchenaut and Moore, 2004, have stated that guilds provide the ultimate end-game platforms. The distiniction is also drawn between social guilds, and what Jakobsson and Taylor call "uber raid," or the more goal-oriented guilds. Either sociability or goal-directedness could be related to addiction or engagement. These questions can tell us whether a major structure in these games, the guild, relates somehow to engagement or addiction.

RQ2: What is the relationship between addiction level and the importance of certain guild characteristics?

A) What is the relationship between addiction level and the importance of guild sociability?

B) What is the relationship between addiction level and the importance of goal-directedness?

While Yee, 2006 suggests that "griefing" (repeatedly killing, and/or using an unfair advantage against other players), manipulation, or performance of otherwise socially unacceptable behaviors in-game is one of five major MMO player motivations. Negative valence corresponds to a number of specific activities within MMO games that can be readily identified as structural characteristics.

RQ3: What is the relationship between addiction level and perceived in-game frequency of behaviors that are socially unacceptable in real life?

Jakobsson and Taylor, 2003, suggested that RL (real life) connections between players constitute special social power structures within a game or server.

RQ4: What is the relationship between addiction level and frequency of interaction?

A) What is the relationship between addiction level and frequency of interaction in-game with RL (real life) friends?
B) What is the relationship between addiction level and frequency of interaction in-game with online friends or guildmates?

Yee, 2006, identifies two of the major motivations to playing an MMO as immersion and a solo/group factor. Each of these correspond to theoretical structural characteristics. These characteristics, depending on the MMO, may be public character biographies, fantasy, and roleplay reward, in the case of immersion, and in the case of individualism, Ducheneaut and Moore's (2004) structured interaction, balance, and Jakobsson and Taylor's (2003) solidarity in the case of individualism. As was discussed earlier, Yee's criteria on individualism were largely unchanged, while immersion underwent a degree of expansion and clarification.

RQ6: What is the relationship between addiction level and level of immersion?

RQ7: What is the relationship between addiction level and level of individualism?

If each MMO's structural characteristics influence gameplay, possibly even addiction, then variations may exist in addiction level and preference for characteristics across MMO games. It may also be possible that regardless of structural characteristics, certain other inherent factors of different games could be influencing addiction level. Even if it were suspected that none of the structural characteristics in this study were remotely responsible for addiction, it would still be reasonable to suspect that some factor within the game, or structural characteristic, would be responsible for the variations. Examination of the various in-game activities undergone within each MMO will help to see whether any of the queried structures firstly, varies between games, and secondly, varies in relation to more or less addiction-related games.

RQ8: What is the relationship between addiction level and specific MMO game, controlling for perceived time spent at different in-game activities?

Hypotheses

The dichotomy between Yee's (2006) motivational factors and Charlton and Danforth's (2004) measure for addiction provides the basis for hypothesis one. One of Yee's five major motivational factors is "manipulation," to manipulate, scam, or otherwise hassle other human players. From the psychological angle, Charlton and Danforth find that "negative valence," performance of behaviors that would be unacceptable outside of the game world (behaviors that are also not lauded within it), factor more highly with a negative, destructive notion of addiction. Here we have, on one side, identification of a behavior. On

the other side, psychologists note that such behavior is quite deleterious. It is thus expected that those scoring highly on "negative valence" will also score highly on addiction.

In this vein, structural characteristics in general may have broad and possibly unexpected influences on addiction. This hypothesis applies to all characteristics, "Arguably, these more developed structural characteristics have an even greater potential to increase levels of video game playing both within society and within some individuals." (Wood, Griffiths, et al. 2004, pg 9). The counter of this may be true. This hypothesis also argues that certain characteristics may be responsible for a lower index.

Data from previous studies can nonetheless give some suggestions of where we might look for these relationships between structural characteristics and addiction. Specifically they show high degrees of interrelation between female gamers and RL interaction, immersion, individualism, and goal-oriented guilds. Nicholas Yee (2006) suggests that around three fourths of females playing MMO games were introduced to these worlds by way of a family member or romantic partner. Chiu et al (2004), using different criteria for addiction, suggested that among children females were less likely to be addicted, and that a large repertoire of activities may act as a countermeasure to addiction. If this is the case, then a high frequency of interaction with RL friends may indicate a large repertoire of activities besides gaming. This information may all suggest also that females on average have higher scores on RL connections and lower scores on addiction.

Similarly, immersion and individualism both relate to the degree which a player might become involved with the story and fantasy (immersion), or with the other players in the game (individualism). Becoming involved in a story or plot, even bringing oneself into it, seems very similar to other technologies of narrative. It's the extension of reading a book,

or watching a movie, only your story might now play an *interactive* role within the game world. This idea is related to the concept of escapism. Escapism, like negative valence, has been noted as existent by Yee (2006), yet detrimental by Charlton and Danforth (2004). Does somebody's involvement in a narrative relate to their want to escape? Not directly. Although roleplay could be set up as a counterpart to escapism, here the hypothesis is that the two will be unrelated. This will contrast with individualism. People who are less likely to play in groups, and more likely to play on their own, will likely have fewer of the aforementioned connections highlighted by Chiu (2004).

Finally, goal-oriented endgame raid guilds. People who prefer less social interaction in their guild, for the same reasons as above, are expected to be more likely addicted. Research in neuroscience suggests that goal satisfaction and reward are major components to addiction. Players driven to raid want the rewards that are coveted in the game world. They are investing large amounts of time to get these rewards. Nonetheless, not all of these players are expected to be addicts. On the other hand, respondents with the combination of preferring a highly goal-oriented guild, while simultaneously preferring a very non-social guild, are expected to score very highly on the addiction scale.

According to Brown's theoretical models of addiction, as a behavior begins to dominate a person's life, achieving "monopoly," a person could thusly be said to be at the height of addiction. Those who score more highly for playing with real life friends, rather than those they know explicitly through the game, may possess a more diverse range of options for dopamine reward. This would suggest the absence of monopoly, and addiction. Those with higher scores on play with real life friends are thus expected to have lower levels of addiction.

Chapter 3: Method

The data for this study was collected through a self-administered, online questionnaire. The study population consists of all MMO players who understand the English language, and have reached the maximum level in their respective game. All data used was quantitative and analyzed electronically with the Statistical Package for Social Sciences (SPSS) software.

Participants

The sample included a random selection of subjects from the games *World of Warcraft*, published by Blizzard Entertainment, *Star Wars Galaxies*, published by Sony Online Entertainment, *EverQuest 2*, released by Sony Online Entertainment, *Dark Age of Camelot*, developed by Mythic Studios and *Final Fantasy XI*, developed by Square Enix. The number of sampled respondents was kept small. The results of this study were augmented with a self-selected batch of respondents, hailing from MMO games as diverse as Anarchy Online, Guild Wars, Ultima Online, Eve Online, and RuneScape. The reasons for including the snowball sample are detailed in the discussion section, while some of the effects are discussed in the limitations section.

There were 291 participants in total. 38 females and 253 males participated in the study. 38 respondents were sampled within games, and 253 respondents were counted through the snowball sample. 32.3% of respondents lived with their parents, 33.7% lived with a spouse or significant other, 16.2% lived alone, 15.5% with roommates, and 2.4% lived with none of these options. Maximum level players seemed to play at a median of 20-29 hours per week. The median age for all respondents was about 23, about 27 for females and

22 for males. 49.1% of respondents reported working a full-time job, and 27.1% reporting themselves as full-time students.

Sampling Procedure

Within each MMO game selected, stratified sampling was used to select a number of English-speaking servers. Every third server was then selected from this list. Lists of all maximum level players in each server's main cities were then created. Certain MMOs restricted the searching for players to these main cities. Since it was apparent that only players in major cities could be queried for some MMOs, only players in major in-game cities were used in all sampled MMOs. Stratified sampling was then used to select respondents from each server, every third respondent being queried over whether they would like to participate. Randomized access codes were used to differentiate between sampled and unsampled respondents. The above stratification sampling method proved technically inappropriate for the scale of this study. A snowball sample was concurrently sent out, providing additional data. The discussion section deals more with the issues involved in sampling MMO games not covered here or in the literature review.

In the preferred sampling method, a list of every maximum level player was generated on each server sampled. Every third player was sampled, repeating the list as many times as was necessary for 20 respondents to be selected. In every MMO sampled, however, over half of the respondents contacted would never respond. Of the other portion that did respond, responses varied widely depending on which game was being sampled. Of the respondents who agreed to take the survey, and took an access code, 59.4% actually followed through and took the survey. This is for all games. Many respondents indicated

that there would be significant time lapse between receiving the code and taking the survey. After two weeks without additional requests for participation, however, both snowball and in-game sampled visitors to the survey seemed to halt completely.

The snowball sample portion of the data was combined with sampled responses. The snowball sample makes up 86.9% of the total sample of 291. Snowball sampled respondents were shown informal requests for participation either through online instant messages, email correspondence, or online non-game-related community forums. These respondents then decided whether or not they wanted to take the survey. It is highly likely that many of these players shared the web address with friends. It was also indicated to the researcher by sampled respondents that after being sampled that they would very likely pass the address along to friends.

Measures

The online questionnaire was 91 questions and completely online. The wording of all questions asked on the online questionnaire was identical to those appearing in Appendix B, with two exceptions: The first exception was the phrase "(MMO name – e.g. "EverQuest")." It was automatically replaced with the name of the MMO which the survey is being filled out for. This was accomplished in two ways. If a respondent was sampled within an MMO game, then their access code was directly linked to that MMO. If a respondent was a member of the snowball sample, they could either select their MMO from a drop-down list, or optionally type in the name of their MMO if their game did not seem to be represented. The second exception, following each question in sections two and three of the survey (provided as Appendix B), questions were followed by five radio buttons (circular HTML

buttons that allow only one clickable option) that corresponded to the variation of answer choices. The questionnaire has three major sections: One, demographic questions, two, addiction-related behaviors, and three, videogame structural characteristics.

Pre-testing of the survey took place at various times, and using different methods. Purposive sampling was used to test demographic, addiction and videogame structural characteristic questions. Structural characteristic questions additionally used limited snowball sampling, as one respondent passed along the survey through one non-gaming community forum, and other respondents sent surveys to friends online. The questionnaire took between 12-15 minutes to complete during pre-testing.

Instrument

Addiction Composite. Level of addiction was measured by adapting the Asheron's Call Addiction (ACAddiction) measure from Charlton & Danforth, 2004. This scale contains 14 items and showed good reliability in the current study with an alpha of .790. In this scale, participants respond to questions on a 5-point Likert-type scale on which 1 = very strongly disagree, and 5 = very strongly agree. A high score on the Addiction Composite represents high addiction, and a considerable inability to control play.

Engagement Composite. Level of engagement was measured by adapting the Asheron's Call Engagement (ACEngagement) measure from Charlton & Danforth, 2004. This scale contains 15 items and shows good reliability in this study with an alpha of .845. In this scale, participants respond to questions on a 5-point Likert-type scale on which 1 = very strongly disagree, and 5 = very strongly agree. A high score on the Addiction Composite represents high addiction, and a considerable inability to control play

Videogame Structural Characteristics. These characteristics came from a variety of diverse sources, as covered in the concepts section. These scales vary in size, and generally showed acceptable reliability, with alpha scores ranging from .723 to .906. The exact reliabilities for each measure are provided as part of Table 1. In these scales, which are part of the questionnaire provided in Appendix B, participants respond to questions on 5-point Likert-type scales which are discussed at length in the concepts section.

Table 1.
Game Element Reliability (Cronbach's α) and Correlation (Pearson's *r*) with Addiction and Engagement

Game Element	α	Engagement *r*	Addiction *r*
	In-game Activities		
Non-advancing	.734	.251**	.028
Non-combat advancement	.794	.240**	.117*
Combat advancement	.748	.287**	.232**
Endgame advancement	.801	.378**	.324**
PvP advancement	.906	.207**	.298**
	Guild Characteristics		
Social	.730	.381**	.316**
Goal-oriented	.734	.326**	.385**
	Frequency of Interaction		
Real life friends	.802	.120*	-.013
Online friends	.733	.309**	.247**
	Miscellaneous		
Immersion	.723	-.220**	-.042
Individualism	.853	-.102	-.036
Manipulation	.797	.027	.215**

*p < .05 **p < .01

Administration of Instrument

Respondents were sampled based on the following sampling procedure. They were taken from major cities, and an effort was made not to sample over one respondent from the same guild. While the aim was initially to keep with the proposed procedures outlined in the literature review, they were not all feasible or necessary for the scope of this study. One particular weakness was that the sample size was far smaller than desired, and hailed most predominantly from the MMO *Dark Age of Camelot*.

Sample messages requesting participation are provided as Appendix A. These sample messages were functionally tested, and were physically sendable within the confines of *most* MMO games. Unfortunately there were complications within some games. Some did not allow users to copy and paste messages. Some did not allow the use of macros, or did not allow macros long or sophisticated enough that they could be used to expedite the process of sampling. "Macros", or pre-set commands, were created for *World of Warcraft* in order to ensure that the same sample message could be used for every player. *EverQuest2* and *Star Wars Galaxies* allowed copying and pasting of data, making switching between the game and a word document the most economical approach. *Dark Age of Camelot* and *Final Fantasy XI*, however, did not allow the use of either of these approaches. Messages had to be typed out in their entirety for every single respondent. This made the process immensely time-consuming. Furthermore, *Final Fantasy XI's* in-game communication system was not part of the pretest. When messages were tested, it became apparent that only very short messages could be sent. In an effort to keep from sending players too many messages, thus markedly disturbing their play, messages needed to be shortened to a bare minimum. These adjusted messages requesting participation are also provided in Appendix A.

Additionally, RP, or "roleplay" conventions were researched, in order to ensure that real world messages would not be offensive. The sample messages in Appendix A were also sent to a number of endgame players, in order to see if they would be received well. While this was a useful ethical consideration to make, more often than not the use of double parentheses around OOC (out of character) messages was seen as superfluous when the requests for participation come in the form of "tells," or private messages. This is because most "tells" are considered OOC by default.

If players indicated that they wanted to participate, then they were given the website address where the survey was located. They were also given an entry code. The website address was very short and simple, so that players could easily remember and type it into a browser. Alphanumeric access codes were randomly generated in the following quantities:

World of Warcraft: 900
Final Fantasy XI: 250
EverQuest: 200
Star Wars Galaxies: 200
EverQuest 2: 175
Ultima Online: 75
Dark Age of Camelot: 75
City of Villains: 75

This entry code system was used only as a measure to differentiate between sampled and unsampled responses to the survey. Only a fraction of these codes wound up being used.

Data Analysis

Data was collected via an online survey, and was written directly into one electronic database. The online database was then downloaded, and imported into the Statistical Package for Social Sciences (SPSS) analysis program. A number of data analysis techniques were used. Cross tabulations were used primarily in order to get a handle on the overall

layout of the data. After this, reliability analysis was conducted using Cronbach's alpha (α), and was used in order to verify internal consistency of composites of questionnaire items. Bivariate correlations using Pearson's product-moment analysis (*r*) were then used in order to determine relationships between game element composites and their individual items with addiction and engagement levels. A correlational matrix was constructed so that relevant concurrent correlations could be identified. Regressions were then run on a large number of variables in order to query the (β) significance of these relationships.

Chapter 4: Results

A correlational matrix was created and linear regressions were run on relevant variables in order to answer research questions. Addiction and engagement measures had been previously tested with regard to MMO games (Charlton & Danforth, 2004). Research questions compared these 29 questions gauging relative engagement and addiction against theoretical structural characteristics of MMO games. The 54 questionnaire items measuring structural characteristics were organized into composites of MMO play. As structural characteristic composites were created using a variety of sources, and were yet untested in this format, table 1 provides internal reliability of each measure in the form of Cronbach's alpha. Each question was examined to see whether or not it fit with its overarching composite. The alpha values reflect composites which were modified after data collection had been completed. A number of these had Cronbach's alphas of over .8 or .9, indicating good reliability. Those that did not have reliabilities over .8 still showed alpha scores in the .7s, indicating that the constructs were good overall.

Bivariate correlation can be used to show certain significant differences in structural characteristic preference between engaged and addicted MMO game players. As table 1 shows, Pearson's *r* values differ markedly in nearly every comparison of engagement and addiction, in some cases showing significant relationships in one value, but not the other. Regression analysis was used to control for multiple concurrent correlations. Regressions, provided as table 2, revealed that most structural characteristics have no predictive relationships with engagement or addiction, while others do seem to be significant predictors of addiction and engagement, to different degrees.

Table 2.
Game Element Regressions Analysis with Addiction and Engagement

Game Element	Engagement β	Addiction β
	In-game Activities	
Non-advancing	.096	-.080
PvP advancement	.180**	.118*
	Guild Characteristics	
Social	.201**	-
Goal-oriented	-	.233***
	Frequency of Interaction	
Real life friends	.021	-.086
	Miscellaneous	
Manipulation	-.073	.083

*p < .05 **p < .01 ***p < .000

Negative Valence and Addiction

Links between negative valence and addiction were explored in hypothesis one. Correlations suggested that a relationship between negative valence and addiction may, in fact, exist. Do addicts actually prefer to scam other players, manipulate other players, and steal things that don't belong to them? Figure 6 shows that very few respondents reported that they had performed these behaviors overall. Despite this dispersion, players scoring highly on the addiction section of the questionnaire showed a significant propensity (r = .215; $p < .01$) toward these manipulation-related behaviors, whereas those scoring highly on the engagement section bore no such relationship (r = .027; ns). Regression analysis however suggests that negative valence does not appear to be a significant predictor of addiction. While there did seem to be a negative relationship between engagement (β = -.073; ns) and addiction (β = .083; ns) with regards to negative valence, clearly neither of these beta values were significant.

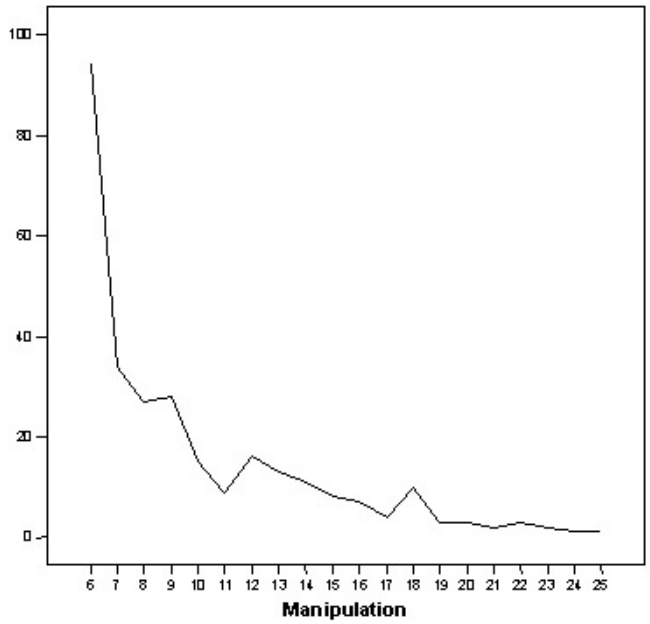

Figure 6. Total scoring on all manipulation questions from all respondents (n = 291).

Addiction and Gameplay Elements

Hypothesis two dealt with any unexpected or interesting relationships between addiction and gameplay elements (the varied activities in which players tackle within the game). These questions all dealt with the perceived amount of time a player would spend performing these specific activities (for instance killing monsters in order to gain experience) as opposed to other activities. Engaged players seem to perceive themselves, overall, to spend more time performing in-game activities ($r = .440$; $p < .01$), whereas addicted players seemed to estimate their play levels to be lower ($r = .350$; $p < .01$). Player versus Player combat (PvP), is the exception to this rule. The correlation between PvP advancement and engagement was much lower ($r = .207$; $p < .01$), than for addiction ($r = .298$; $p < .01$). When regression analysis was used to control for related variables, PvP advancement became the only gameplay element to have any significant relationship with addiction or engagement. This relationship was counter to what bivariate correlation suggested; PvP advancement was

highly related to both engagement and addiction, but more strongly to engagement ($\beta = .180$; $p < .01$) than addiction ($\beta = .118$; $p < .05$).

Roleplay, Immersion, and Addiction

Escapism has been flagged by the literature as most likely related to detrimental addiction. Nonetheless, it was hypothesized that roleplay and immersion, feasibly linked to escapism, would show no connection to addiction. While this turned out to be the case, and no correlation with addiction was found ($r = -.042$), roleplay and immersion shared a significant negative correlation with engagement ($r = -.220$; $p < .01$). As figure 7 shows, dispersion of scoring on the total composite lends itself to more rather than less roleplay, character involvement, and immersion into the game. Regression analysis did not help to clarify this relationship. It seems almost contrary that these immersive elements be correlated with lower levels of engagement, and it is unclear what may be prompting these low levels of engagement.

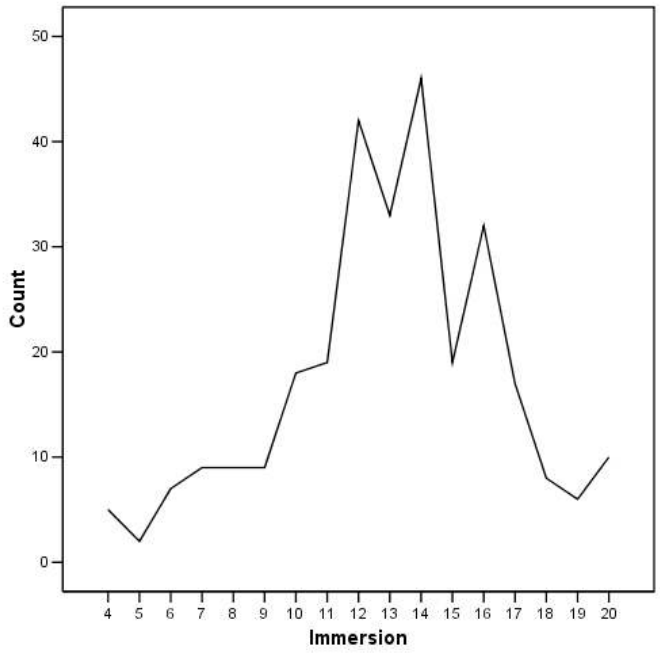

Figure 7. Total scoring on all immersion questions from all respondents (n = 291).

Individualism and Addiction

Related to immersion is the concept of individualism. It was hypothesized that due to the isolation implied by high scores on an individualism composite, that individualism would share a significant positive relationship with addiction. The individualism data, however, showed no substantial relationship between either engagement (r = -.102; ns) or addiction (r = -.036; ns). Regressions revealed no additional relationships.

Guild Preference and Addiction

Hypothesis six stated that respondents with an extremely high preference for a raid/goal-oriented guild, and a simultaneous low preference for a social guild would be related to higher levels of addiction. In a sample size of 291, not a single respondent scoring in the two highest raid guild preference levels scored below the median on social guild

preference. It seems that the respondent wanted for this question does not exist. No respondents with reasonably high raid guild preference scored far enough below the median to warrant exploration of this hypothesis. It appears that if a player has a heavy preference for a raid guild, they will also have a reasonable preference for a social guild. The opposite is not true, as players with heavy social may either prefer a low or high amount of guild goal-orientation.

While correlations failed to suggest any difference between engagement or addiction with regard to guilds, regression analysis revealed guild preference to be a significant predictor of engagement or addiction, depending on the preference. Social guild preference was a significant predictor of engagement ($\beta = .201$; $p < .01$), with no significant relationship for addiction. Goal oriented guild preference was a significant predictor of addiction ($\beta = .233$; $p < .000$), with no significant relationship to engagement.

Real Life Interaction and Engagement

The seventh hypothesis, that high amounts of real life interaction would have more of a positive relationship with engagement (engagement $r = .120$; $p < .05$) than addiction (addiction $r = -.013$) was well supported by bivariate correlations. While regressions suggest a negative relationship between addiction and real life friends, table 2 shows that this relationship was not a significant predictor.

Gender Demographics

Females of the maximum level were introduced into MMO games by romantic partner 41.2% of the time. Introduction to MMOs in this manner occurred primarily among 23-30 year olds. The second largest contribution was real life friends, accounting for 23.6%

of women. Women appeared to stray either toward either having more maximum level alternate characters, “alts,” or very few compared to their male counterparts. In the 36 and over age bracket, the number of women with over 10 maximum level alts surpassed that of men, although nearly twice as many men occupied the same age bracket.

Chapter 5: Discussion

Technical and Ethical Considerations of Videogame Sampling

At the outset, a major aim of this research was to test the technical limitations of in-game sampling. While data collection was in progress, it became apparent that ethical questions specific to MMO games also needed to be examined for the benefit of future studies. While the overwhelming majority of respondents reacted very positively to requests for participation, there was some negative feedback to the request for participation on the part of respondents and academics. Internal limitations that became apparent on the first run of the instrument gave additional reason to slow further sampling in-game as far as this study was concerned. Sampling was discontinued after responses necessary for balancing the sampled portion of the survey were collected.

Limiting the sample in this way was not a decision taken lightly, although a number of factors went into it. Rather than failures, these should be seen as knowledge that can be used to better decide whether such approaches are warranted in future studies. First off is the major time commitment and resource expenditure that should be invested if this method is to be used. In-game sampling really should not be attempted by a single researcher. Notable issues include the time of day, week or year. Certain players are more likely to be playing in the morning, afternoon, or night. Certain players can only play on some days. Others have much more latitude to play over certain times of the year, for instance some students may often have more time during a summer vacation. It is postulated that a team of researchers, each sampling a separate game (preferably one in which they are advanced players or otherwise proficient) at the same times of day, week or year would be able to provide the

most consistent and accurate data on MMO games. That is to say that a team of 12 researchers may be able to sample 4-12 games at the same time. More than one researcher may be used for a single game or server if it should feasibly be weighted more heavily or contains unique aspects that would require it. The cost of hiring these researchers, and of licensing and/or paying monthly fees for their respective games, is prohibitive. The current research ran into numerous financial and time-related stumbling blocks.

Another major consideration to any in-game sampling is language. This study set out to exclude *Lineage* and *Lineage 2*, as its heavy following in Korea (significant portions of the country's population play the game) created an unknown dispersion of English vs. Non English speakers. In this vein, when sampling began within *Final Fantasy XI* it soon became apparent that two major limitations muddied data collection as far as this study was concerned. The first was the distinction between players using a computer and those playing the game via a console connected to their television. Those on the console were far more likely to decline participation. One respondent additionally noted that she did not have access to a computer. MMO games accessible by an Internet capable console must have certain considerations taken into account if they are to be sampled. The much larger consideration when sampling from Final Fantasy XI, also discussed in the limitations section, was the language barrier. Of those responding to the researcher, over half did not speak English. They used an in-game Japanese to English translator in order to portray this to the researcher. If > 50% of respondents did not speak English, and if the server was not named or titled in a way which might make it clear what language is used, then how do we treat such MMOs in future studies? This is especially problematic considering Final Fantasy's relative contribution to the overall number of active MMO subscribers.

On a side note, a tertiary technical consideration with regard to *Final Fantasy* is their very limiting game licensing system. Unlike every other major MMO on the market, *Final Fantasy XI's* licensing appeared to, at the time of this study, simply vanish once the monthly subscription is cancelled. This is extremely limiting from a research standpoint, and is considered by many to be a highly unethical business practice on the part of Square Enix, the developer of *Final Fantasy XI*.

Despite considerations to time, finances, and language, the researcher cannot overlook ethics. While this study took great pains in amalgamating MMO research data for the purposes of both safeguarding respondents while simultaneously giving them something for their time, contacting respondents in game proved more complex than was originally anticipated. In the case of this study the researcher had to contact the most invested, accomplished players, on their "turf"; these are worlds which they have utterly mastered. Most importantly, they were being contacted during time which they had set aside to play. There is a considerable amount of stress involved, especially if the researcher has any conception of and/or respect for the time investment required for a particular MMO game.

It was decided that respondents would not be told that the survey dealt with addiction. It still is not clear whether this was the right decision. There are valid arguments on both sides of this point. On the one hand, participants can be informed of the full nature of your study, and offered results as soon as they become available. On the other hand, knowledge of a survey's intent is likely to change results, especially with regard to something like addiction. Is it best to take a cautious stance with regard to societally charged words like, "addiction?" While most gamers taking the study seemed reasonably mature, data revealed that many were under the age of 17. Perhaps these respondents should not see results to an

"addiction" survey. If they are underage but nonetheless addicted, which some respondents seemed to be, should they be told? Would that affect them aversely? This is a line of research that, relative to other fields, lacks in broad ethical standards. Additionally, the lack of game understanding on the part of the Institutional Review Boards of most institutions places upon game researchers an onus that must be taken seriously.

Aaron Delwiche, after teaching courses in MMO research methods, developed a Frequently Asked Questions (FAQ) sheet describing ethical considerations to the intended audience of research participants coming from within an MMO game (Delwiche, 2005). While these guidelines, provided as Appendix F, may not be economical for every study, they provide an excellent standard for any MMO-related research. Researchers deviating from such should need to describe why they are doing so, considerations made to those sampled, and the benefits to the greater community of online gamers.

Beyond these first two ethical questions, any kind of large-scale sampling may contribute to a problem of researcher distrust. While there is little quantitative data that would suggest an existent risk, a few concerns on the part of respondents had the potential to suggest such a bias. "Ok I hope you will get more people that will take i… i know most will probably laugh only because people who don't play mmo's don't understand us ;)," were the comments of one respondent. More than one respondent was both mature and inquisitive in making sure that this survey was for academic purposes. Once it became clear that the researcher was paying for this research as opposed to being paid for it, 100% of these respondents were not only quite happy to take the survey, they were generally very interested in the research itself. While qualitative data suggests that there may be a serious risk, it also

may suggest that transparency does quite a bit to lower that risk. Nonetheless, some qualitative data suggests that certain players are averse to any and all disruption.

The more one considers the technical and ethical considerations that must be made before studying players in-game, the more it becomes clear that the decision to sample in-game should be deliberate and extensively planned for. Nonetheless, a sampled approach has the potential to provide data that is superior in accuracy to anything attempted heretofore.

Videogame Structural Characteristics and Addiction

Addiction and engagement, in many cases, have very similar relationships when correlated with structural characteristics. In other cases, there are significant differences. This might suggest that games designed a certain way are more prone to addict players rather than engage them, or visa versa. Perhaps this suggests that certain, usually maladaptive in-game structural characteristics are immediately addictive, while certain other characteristics, possibly social guild preference, may bolster a resistance to addiction. Perhaps players with natural preclusions to addiction seek out only certain stimuli. Nonetheless, if some quantifiable process occurs during play, then knowledge of this process can help us to educate the gamers, health practitioners, and academics involved. The preface suggested that any relationships between structural characteristics and addiction would likely be incredibly complex. At current the data seems to support this statement. This data does not suggest that game design can prompt addiction, or that only addictive personalities are becoming addicted. Neither of those conclusions are warranted. The following section explores prominent correlations as well as significant predictors as areas where further research seems most warranted.

With regard to negative valence, perhaps the ability to abuse any system opens the door for manipulation, effectively giving immediate, tangible rewards. If a player is robbing other players of their rewards, this can create incredible in-game benefits. Not only might this be an undeniable mechanism for dopamine generation, but people hooked on performing unvalued behavior may be prompted to further these behaviors, as the negative values placed on them by society may create negative feelings, and thus likely feed a greater need for dopamine in order to correct those negative feelings. This cycle may occur indefinitely. The negative behavior will bring benefits that wipe away negative feeling. Since benefits are ill-begot, they bring further negative feelings, which then necessitate increasingly greater negative behavior to bring increasingly greater benefits, and so on. While regression analysis seemed to explain away the initial correlation, the minor negative relationship, as well as the importance of negative valence in various literature warrant that it be studied further.

It may also be interesting to study a player's interaction with side activities. If an individual is drawn to side activities, whether in an MMO game, or in life, does this then present a natural defense against addictive behavior? Behavioral diversity as a rule seems an effective counter to what Brown calls "motivational monopoly." In Brown's advanced case of addiction, an individual can only use a single "monopolizing" behavior for dopamine release. Does play with one's real life friends connote greater connection, and therefore a greater motivational diversity?

Figure 8. Side activities, for instance trick or treating within Blizzard Entertainment's World of Warcraft, appeared at first to be significantly related to engagement, but not addiction.

Why might players who play with their real live friends share a significant affinity with engagement, but not addiction? Perhaps the presence of real life friends connotes greater resistance to a single activity monopolizing motivation. Perhaps these players can tap connections to worlds outside those occurring within the game; sometimes even having those connections tapped for them. Playing with real life friends and having friends offer up support for a real life problem gave the highest contributions to this composite. Similarly, engagement shared a higher correlation on interaction with online friends than did addiction. Can diversifying relationships be built between people who meet explicitly within a MMO? Perhaps friendship is related to engagement for a completely different reason. While

regression analysis showed interaction with real life friends or online friends to be a less than significant predictor, there is sufficient support in the data and literature to continue their exploration in future research.

PvP advancement was, at first, the only composite to show a larger positive correlation with addiction than engagement. Regression analysis then showed engagement to actually have the larger, more significant relationship with PvP advancement. While PvP and addiction showed a small relationship, it was nonetheless significant. Understanding why PvP advancement is a significant predictor of both engagement and addiction, where non-advancing, non-combat advancing, combat advancing, and endgame advancing gameplay may not be, could help to shed light on the process of addiction.

At first the data did not suggest anything particularly shocking with regard to guild preference. When controlled for, however, preference for social and goal-oriented guild membership both became significant predictors for engagement and addiction, respectively. Preference for a social guild was related to engagement, but not addiction, whereas preference for a goal-oriented raid guild was related to addiction, but not engagement. That these concepts are not mutually exclusive should come as no surprise; those that prefer social guilds often also enjoy advancing their character via gear, while a key ingredient to a successful raid guild is a strong sense of community.

There is a more compelling question than simply asking about the in-game processes involved with regard to guild preference, PvP advancement, negative valence, side activities, or connection to real life friends. While it is important not to apply this idea too rampantly, videogame structural characteristics may correlate with ways in which addiction operates in the real, non-game world. It has been suggested that MMO worlds provide economists with

rigorous, undisturbed prototypical worlds. If this is the case, then perhaps research that deals with addiction within a game has an unprecedented potential for helping people who struggle with addictions, both within and outside the game world.

With regard to engagement correlating more with highly estimated play levels than addiction, it was suggested that engagement and addiction should be queried for all players, not only those of the maximum level; casual gamers may further contribute, or even detract from these estimations. Do addicts underestimate their play? It would be plausible. Just as plausible as extremely engaged players overestimating theirs, however. This discrepancy is an interesting one, and makes it less confounding that all but one game element composite shows higher correlation scoring in engagement than addiction.

While the organization of game elements (side activities, non-combat advancement, combat advancement, endgame advancement, and PvP advancement), guild preference (social and goal-oriented), frequency of interaction (between real life and online friends), manipulation, immersion, and individualism were meant to represent theoretical constructs, they are by no means set into stone or exhaustive. In fact, they were meant to map a more general framework, in an attempt to see which zones might be more prone to analysis in terms of addiction. Addition of new questions, subtraction of others, and overall rearrangement to a certain extent may create a measure superior to the one provided. One must simply remember that the questions themselves must be consistent groupings in terms of their face values, which is to say that they have to actually represent MMO games in a cogent fashion.

Instead of certain elements acting as a net for addicts, immediately hooking them, and then reinforcing dopamine loops, games may perhaps attract addicts in another fashion. It

seems plausible that addiction may be a process. Certain structural characteristics may appeal almost immediately to some personality types, perhaps societally unvalued behavior or PvP advancement. Interacting with these structural characteristics delivers certain rewards, and a subsequent requirement for more of the dopamine given by this interaction. Meanwhile, other structural characteristics may act as a safeguard to eventual addiction; playing with real life friends or social guilds may follow patterns which facilitate behavior diversity, keeping a single behavior from monopolization. In between these two extremes, there seems to be a process whereby gamers individually, or in quantifiable patterns, become fixated on the richly variable rewards offered by the structural characteristics of these worlds.

In the first phase of this hypothetical model gamers may enjoy basic combat, non-combat activities, endgame activities, and even PvP rewards. At some point, however, certain gamers could begin to rely on their preferred elements, perhaps endgame advancement, PvP advancement, interaction with goal-oriented raid guilds. It is also possible that these structures, while not inherently addictive, require behavior that mimics motivational monopoly to such a degree that highly engaged players may at some point find themselves addicted. That certain people are addicted seems clear. Less clear is the process of moving from enjoyable engagement to harmful addiction. Understanding different levels of game element play in a cross-sectional study is very helpful, but in-depth longitudinal research, of a qualitative and quantitative approach, is likely the critical piece of the puzzle in determining how and why certain people are addicted to games.

Also necessary to note is that the prevalence of engagement over addiction at the endgame suggests that even at extreme levels of play, videogames are not necessarily detrimental. It suggests that a large portion of these players simply enjoy gaming, and do it a

lot. The only difference between is that this level of gaming takes place in a mediated environment, whereas traditional leisure activity does not. It is doubly problematic in that the computer environment is necessary for a number of other, especially business applications. In this respect, someone could be the quintessential non-addict, and very engaged in a number of activities. It would just so happen that all must be pursued via a computer. This may make identification of problematic play much more difficult, the non-gaming friend or family member could easily overestimate or underestimate the scale of the problem.

Gaming research may also have certain health impacts, in terms of vision, nutrition (over 35% of respondents either agree, or strongly agree that they miss meals due to their gameplay) and cardiovascular exercise, among others. It also fundamentally changes our conception of activity. Yee (2006) has suggested that games hold universal appeal. If this is the case, and games grow ever more popular, we have to truly examine whether interaction with mediated environments to such a major degree is something that we want. Perhaps while we examine the consequences of sampling within this video game world, we should examine the benefits and consequences of playing explicitly in one.

Conclusion

When neuroscience is compared against Brown's view that certain behaviors monopolize an addict's life, two things will become clear. First, certain people are more susceptible to addictions. Second, the more any reward cycle is performed, the more it becomes stamped in. If specific activities, or structural characteristics, offer easy to perform, effective rewards, then over time such structural characteristics will very likely stamp in

dopamine dependencies. Of the structures that were examined: in game activities, guild preference, behaviors not socially appropriate in everyday life, frequency of interaction with either real life or online friends, immersion, and escapism, many correlated with engagement and addiction to varying levels. Some structural characteristics also had varying and significant predictive relationships for engagement and addiction.

This seems to indicate that addiction is a process. Certain structural characteristics appeal immediately to some, perhaps addictive personalities, while still others seem to protect against motivational monopolies. There are other characteristics which are related to engagement and addiction, just to varying levels. Additionally, there is a complex interrelation of structures. This makes sense, as numerous structures do overlap with many play styles. Perhaps being drawn to characteristics is a factor of personality, brain chemistry, and an individual's overall susceptibility or resistance to addiction. On the other hand, it seems likely many structural characteristics are process-based, and that some of these processes attract some types of play more than they do others. There are a million little pieces working together in these games. Understanding this process not only holds the potential for helping the people with real gaming problems. Research within prototypical game worlds may have real implications for helping people with other kinds of non-game addictions.

Limitations of the Study

Neurobiological research indicates that dopamine is the essential chemical involved in motivation and addiction. While this study may build on psychological aspects that correlate with dopamine imbalance, laboratory analysis of brain

chemistry differences amongst video game addicts would be extremely useful in validating Charlton and Danforth's, or any other scholar's addiction measure. That said, ignoring the wealth of psychological indicators for addiction which stand apart from dopamine would strip criteria of their face value. That this study is meant to be preliminary means that it may however be a little early for laboratory testing. While Thalemann and Grüsser have determined that gamers share certain characteristics with substance addicts, it is not substantial proof that games themselves are addictive. This study shows preliminary data that certain game elements relate differently to engagement and addiction, yet future studies should bring in psychological as well as neurobiological work in order to synthesize an explanation of the process.

Additionally, one major limitation is the lack of extensive testing for Charlton and Danforth's (2004) MMO measure at the time this study is being conducted. While on the face, the concepts behind their instrument build from Brown, Griffiths, and others in ways that seem intuitive, the effectiveness of this test for measuring addiction should be verified beyond simple reliability testing. More rigorous methods, especially with regard to sampling, will improve the validity of their measure. It is nonetheless acceptable to be using this measure as research into gaming addiction, especially relative to structural characteristics, is entirely preliminary.

In this vein, some Structural Characteristics had no previously used instrument or were otherwise made specifically for one MMO, or were too restrictive for the scope of this study with regard to the number of MMOs being sampled. The questions without precedent went through relatively minor pre-testing. The concepts

and questions created are an attempt to map a number of conceptual structures within MMO games, and are by no means exhaustive. Again, this is necessitated by the sheer size and variation of structures within these games, combined with the fact that this study is preliminary in nature. This study is also meant to be conservative in scope. That is to say that it would be clear to any gamer that the structures queried by this study are in no way exhaustive. This study simply seeks to determine if the major structural characteristics flagged by previous research relate to addiction.

Not sampling from Lineage or Lineage 2 will skew data away from being reflective of certain populations. These Korean MMOs command at least 40% of the market share for the genre of MMO games. In this vein, over half of all responses within the game *Final Fantasy XI* came from Japanese speakers communicating via an in-game translator. Not counting these, or other non-English speaking MMO games keeps this study from accounting for cultural differences which may fundamentally change what is perceived as gaming addiction within a person and/or society. These cultural differences are nonetheless outside the scope of this study.

Responses from the in-game sampling consisted of relatively equivalent numbers of players from various MMO games, where responses from the snowball sample came primarily from Dark *Age of Camelot* and *World of Warcraft*. The large showing of *Dark Age of Camelot* players seems to suggest either that something inherent to their population invites survey analysis, or more likely that a snowball sample inviting responses to a self-selected survey is likely to elicit results whose reliability cannot be tested for. Overall, the small size, inclusion of self-selected sampling, and apparent discrepancy between sampled and unsampled respondents all prohibit this study from making sweeping generalizations about

addiction across all MMO games. To do so at this stage would be silly, anyway. That said. this sample does not preclude this study from its main goal, to provide preliminary data on how addiction and engagement relate to structural characteristics among MMO players of the maximum level. Put another way, we can clearly still make some generalizations about maximum level characters based on the data that was collected.

There are some significant differences between the sampled and unsampled responses, aside from the prevalence of certain games. Gender is one. Of the sampled respondents, 31% were female. In contrast, just under 13% of the snowball sample were female. This is a significant difference. It is possible that female respondents were more likely to respond to a request for participation within the game. It is also possible that the snowball sample, being random in nature, happened not to enter as many social circles which include women. Female gamers may also be inherently disinclined to answer a self-selected survey. It is possible that all or none these factors were responsible for this discrepancy.

Directions for Future Research

Longitudinal Data Collection

Clearly, gauging relationships between structural characteristics and addiction over time would provide far more information than a one-shot study. The primary goal of a longitudinal study would be to see how the relationship between structural characteristics and addiction changes with time. We have seen that structural characteristics seem to correlate to or predict higher or lower levels of addiction and engagement, but which really affects which? Is it a complicated process or give and take, as is suggested in this thesis, or do very specific factors drive the process? Primarily, longitudinal research would seek to find whether use of specific structural characteristics will increase or decrease the level of

engagement or addiction. Secondarily, depending on the layout chosen, sampled studies could give us more accurate demographics than are currently available. Creative and thoughtful research design in a longitudinal study could accomplish these goals, and perhaps others.

Expanded and or Amended Theoretical Models

Beyond just social research, the study of games will benefit from expanded theoretical models as diverse as the fields involved. Should we be able to cite videogames? Prominent style guidelines published by the APA and others should handle this. Media theories hail from a variety of academic disciplines, yet few of these have acknowledged, let alone begun to compensate or adapt themselves to the prominent media forms available. Edward Castranova (2003), Alf Rehn (2004), Jane McGonigal (2004) and Nicholas Yee (2001, 2006) stand out as academics working toward expanding theoretical understandings of games and media. Academe, however, needs to take an active and informed interest in media forms that are experiencing explosive growth. We need new media theories. They can come from Sociology, Communications, Economics, Computer Science, Psychology or any other related field. We simply need more conflicting, educated voices in order to build a credible academic basis for understanding these media.

Development of Theoretically Rigorous Criteria for Addiction to Games

Blindly accepting certain addiction criteria is hurting research. Making a foundation for videogame addiction criteria from predominantly Internet and computer addiction literature, using research with poor or unstated theory and/or methodology, and the prevalence to which such approaches are accepted is hurting research. Psychologists, neuroscientists, gamers, academics, and others must look critically at what actually

comprises addiction. They then need to settle on fewer criteria. We, as researchers, need to then use only those criteria which have been justified with real theoretical basis. This must be interdisciplinary in nature. This must also be include diverse and conflicting voices. This can happen in a symposium, it can happen on a website, at the Game Developer's Conference, at E3, or in a developer's backyard. Nonetheless, it must happen. Reliance on commercially motivated, recklessly justified, conceptually confused, reductionist criteria for addiction harms people and must stop as soon as possible.

Elucidation and Expansion of Structural Characteristics

Structural characteristics provide one of the most straightforward avenues available for analyzing play. Additionally, their pliable nature may invite their use in media theory more generally. The elucidation or clarification of structural characteristics, perhaps within or as an element to one of the aforementioned media theories, should be developed further.

Sampling Methodologies

While the current work did not meet all of its methodological goals, it is hoped that by clarifying the ways in which sampling can be improved, academics might engage in a discourse on the accuracy and ethics of different forms of sampling. Certainly surveys, questionnaires, interviews, or other traditional forms of data collection reflexively change in some ways when used in regard to videogame playing. Entirely new forms of data collection, many of them involving using games themselves to collect data, are exciting and surpassingly useful to the researcher. For instance, Nicholas Yee describes a data collection method used by the Palo Alto Research Center (PARC) PlayOn project which involves using the game itself, in this case the User Interface of Blizzard's *World of Warcraft*, in order to collect huge

amounts of demographic data (Yee, 2005). Combining new and old methodologies in creative and elegant ways, while perhaps a lot to ask, could do a lot to augment the accuracy, reliability, and overall quality of the data that we do have.

Appendix A: Sample Requests for Participation

Sample request for participation

Initial message. (sent via in-game private chat, or "tells")

M1 (start – these two messages appear one after another, but are separated due to size limits for in-game messages)

Hi, I'm conducting a study through the University of Hawaii at Mānoa. It will ask different questions about what you do in (MMO name – for example "EverQuest") and in real life. After completing it, the site tells you how "addicted" to videogames you are.

The survey will take about 12-15 minutes to complete. I picked you based on some specific things, (class, level, guild, etc.) so try to let me know if you're interested. If so, then I'll give you the website for the survey.

Sample request for participation in an RP server

M1a (A revised message for players on RP "role play" servers. OOC, or "out of character" messages are generally very rare, so messages to those players should include an appropriate warrant. Usually personal messages or tells are OOC, although one particular convention is to begin and end each statement with double parentheses before and after a statement "(( ))")

((Hi, I'm conducting a study through the University of Hawaii at Mānoa. It will ask different questions about what you do in (MMO name – for example "EverQuest") and in real life. After completing it, the site tells you how "addicted" to videogames you are.))

((I apologize for the out of character message, but your responses extremely important, as roleplayers are rarely counted in this type of study.))

((The survey will take about 12-15 minutes to complete. I picked you based on some specific things, (class, level, guild, etc.) so try to let me know if you're interested. If so, then I'll give you the website for the survey. Again, I apologize for the OOC message.))
Note: While OOC message conventions were used during sampling, they seemed superfluous.

M2 (if they appear interested)

Awesome, the website is: _____. The survey is completely anonymous. Use the code _____ to enter the site. Since you were picked because of certain important things, these codes are necessary for block out people who weren't selected.

You're more than welcome to tell other players about this survey if you like it. The same "addiction" information is provided at the end of the survey. The only difference is that their answers won't be used in this survey.

M3 (if they don’t appear interested, then I will simply leave them alone)

Alternative (shortened) sample request for participation

M1b (these messages were used in games where the maximum character limit for in-game messages did not allow the sending of the M1 message - specifically these were used for Final Fantasy XI)

Hi, I’m conducting a survey through the University of Hawai'i, it takes 12-15 minutes.

It asks how you play Final Fantasy XI, then tells you how “fixated” on games you may be.

Try to let me know if you’re interested or not. If so, then I’ll send you the website.

M2b (shortened follow up questions for interested participants - specifically these were used for Final Fantasy XI)

Awesome (this message was sent immediately)

The site is: http://webdata.soc.hawaii.edu/mmo-survey/ and is completely anonymous.

Use the code: 1111xxxx to enter the site. Codes just block out people who weren’t selected.

Tell anyone you like about the survey. The same “fixation” information is provided.

Their answers just won’t be used in this survey.

Appendix B: Questionnaire

Consent Form

Name of Study: Videogame Structural Characteristics and Addiction.

Before agreeing to participate in this research study, you should read and understand the following explanation of the proposed procedures. It describes the safeguards, benefits, risks, and your right to withdraw from the study at any time.

Purpose of the study and how long it will last: This study will ask you questions about your behavior with regard to playing __name of MMO__ (for instance "World of Warcraft"), and how often you play different parts of __name of MMO__. The survey should take about 15 minutes.

Description of procedures/elements that may result in discomfort or inconvenience: There are no foreseeable physical risks to you as you complete the online survey.

Benefits to the subjects or others: This survey seeks to explore how different people see structural characteristics (for instance, crafting an amazing item), so that games can be made to be more enjoyable, and more healthy for their players.

Confidentiality: No personal data will be collected from you. While the survey may ask you questions about games you've played, what you prefer to do in game, or gaming's relation to

what you do in real life, absolutely no information whatsoever can link your answers to you personally. This survey is completely anonymous.

Withdrawal from Study. You are free to withdraw your consent and discontinue participation in the study at any time. You are also free to choose which questions you wish to answer, although only fully completed surveys will be able to return data on your individual gaming health and preferences.

Payment for participation in the research: Participants in this study receive no payment for completing the survey.

Legal Rights: You are NOT waiving any legal rights by completing this consent form.

Review for protection of participants: This research study has been reviewed and approved by the UHM Committee for the Protection of Human Subjects, they can be reached at (808) 956- 5007 within the US. Their mailing address is 2540 Maile Way, Spalding Hall 253, University of Hawaii Manoa, Honolulu, HI 96822.

RESEARCH SUBJECTS' RIGHTS: I have read or have had read to me all of the above. By continuing this survey, you agree to the above.

If you have any questions about this research, please contact the primary researcher Neils Clark, Communications Department, University of Hawaii at Manoa, neilsclark@hotmail.com.

I understand that I do not have to take part in this study, and my refusal to participate or to withdraw will involve no penalty or loss of rights or benefits or legal recourse to which I am entitled. The study personnel may choose to stop my participation at any time.

By completing the survey I signify that I understand my rights as a research subject, and I voluntarily consent to participate in this study.

Questionnaire

Part 1/8: Basics.

Instructions: The following questions ask about "Demographic Variables". This is another way of saying that other smart people want to know your age, sex, and living situation, even if those things aren't what's being studied. Go figure, but we'll get them over with first.

1. What is your gender? a. male b. female
2. How old are you? a. 17 or younger b. 18-22 c. 23-25 d. 26-30 e. 31-35 f. 36 or older
3. Who are you living with? a. with my parents b. with a spouse/significant other c. alone d. with roommates e. other

4. How many hours per week do you spend playing Massively Multiplayer Online (MMO) games? a. 0-9 b. 10-19 c. 20-29 d. 30-39 e. 40-49 f. 50-59 g. 60+
5. What is your "employment situation"? a. Full-Time Job b. Part-Time Job c. Unemployed d. Full-Time Student e. Part-Time Student f. Homemaker g. Retired
6. Who first got you into MMO games? a. I got myself into MMO games. b. romantic partner got me into MMO games. c. family member got me into MMO games. d. real life friends e. online friends. f. none of these options
7. How many MAXIMUM LEVEL alternate characters, or "alts", do you have in (MMO name – e.g. "EverQuest")? a. 1 b. 2 c. 3 d. 4 e. 5 f. 6-7 g. 8-9 h. More than 10. i. I don't have any maximum level alts.
8. What MMOs have you played? Check all that apply. a. World of Warcraft (WoW) b. Everquest (EQ) c. Everquest 2 d. City of Heroes (CoH) e. City of Villains (CoV) f. Star Wars Galaxies (SWG) g. The Sims Online h. Final Fantasy XI i. Ultima Online (UO) j. Asheron's Call k. Dofus l. Era of Eidolon m. Horizons o. Puzzle Pirates p. Sphere q. Second Life r. Toontown Online s. PlanetSide t. Eve Online u. Mankind v. Shadowbane w. Guild Wars x. A Tale in the Desert y. Asheron's Call 2

next>>

Part 2/8: Behaviors.

Instructions: The following questions ask about your gaming personality. Answer choices range from 1 (one) to 5 (five). One means "Strongly disagree," two means "Disagree," three means "Neither agree nor disagree," four means "Agree," and five means "Strongly agree."

9. I have Neglected important things because of (MMO name – e.g. "EverQuest").
10. My Social life has suffered because of (MMO name – e.g. "EverQuest")
11. (MMO name – e.g. "EverQuest") has interfered with my work.
12. When not playing (MMO name – e.g. "EverQuest") I become agitated.
13. In the past, I have made unsuccessful attempts to reduce the amount of time that I play (MMO name – e.g. "EverQuest").
14. I have been late for engagements because of (MMO name – e.g. "EverQuest")
15. I think that I'm addicted to (MMO name – e.g. "EverQuest").
16. Arguments have started because of how much I play (MMO name – e.g. "EverQuest").
17. I have failed to get enough sleep because of (MMO name – e.g. "EverQuest").
18. I never miss a meal because of (MMO name – e.g. "EverQuest").
19. I have never used (MMO name – e.g. "EverQuest") as an escape from socialization.

20. I feel a sense of power when playing (MMO name – e.g. “EverQuest”).
21. I spend more money than I should on (MMO name – e.g. “EverQuest”).
22. It wouldn’t bother me to never play (MMO name – e.g. “EverQuest”) again.
23. I feel happy at the thought of playing (MMO name – e.g. “EverQuest”).
24. (MMO name – e.g. “EverQuest”) is unimportant in my life.
25. The less I have to play (MMO name – e.g. “EverQuest”) the better.
26. I hate to go without (MMO name – e.g. “EverQuest”) for a few days.
27. I spend little spare time playing (MMO name – e.g. “EverQuest”)
28. I feel drawn towards (MMO name – e.g. “EverQuest”) when I see it.
29. I rarely think about (MMO name – e.g. “EverQuest”) when not playing.
30. I pay little attention when people are talking about (MMO name – e.g. “EverQuest”).
31. I get a buzz of excitement while playing (MMO name – e.g. “EverQuest”).
32. I can’t understand why people like (MMO name – e.g. “EverQuest”).
33. It’s important for me to be good at playing (MMO name – e.g. “EverQuest”).
34. I want to spend increasing time playing (MMO name – e.g. “EverQuest”).
35. I like the challenge of (MMO name – e.g. “EverQuest”).
36. I try to make sessions of (MMO name – e.g. “EverQuest”) last as long as possible.
37. (MMO name – e.g. “EverQuest”)’s jargon sounds stupid to me.

next>>

Part 3/8: In the Game.

Instructions: The following questions ask how much time you spend doing certain things in the game. Answer choices range from 1 (one) to 5 (five) again. Here, one means "a very small amount of time," two means "a small amount of time," three means "neither a small nor a large amount of time," four means "a large amount of time," and five means "a very large amount of time." If your game doesn't have one of these activities, then just mark "a very small amount of time" for the activity not in your game.

How much time do you spend, or have you spent at (MMO name – e.g. "EverQuest")'s side activities?

38. Exploring new areas
39. Taking time to find (MMO name – e.g. "EverQuest")'s Easter eggs (hidden/for-fun features)
40. Taking time for (MMO name – e.g. "EverQuest")'s special events (for example, in World of Warcraft, the St. Valentine's day screenshot contest)
41. Taking screen shots of (MMO name – e.g. "EverQuest") scenery/architecture
42. Helping out other players

How much time do you spend, or have you spent at (MMO name – e.g. "EverQuest")'s non-combat activities, like crafting, making money, or gathering resources?

43. Making Money
44. Crafting items or equipment
45. Acquiring resources or components
46. Acquiring items or recipes that improve your ability to craft

How much time do you spend, or have you spent advancing your character's combat ability?

47. Acquiring items that improve your combat ability
48. Completing quests in order to gain experience
49. Grinding (Killing mobs/monsters that are not quest-related, or not needed for a quest) in order to gain experience
50. Transit between different combat objectives

How much time do you spend, or have you spent performing certain endgame tasks?

51. Acquiring a form of endgame transportation (for example, Epic Mount in World of Warcraft, or AV-21 Landspeeder in Star Wars Galaxies).
52. Acquiring epic/endgame items or recipes that improve combat abilities
53. Acquiring epic/endgame items or recipes that improve non-combat abilities

54. Gaining access to special endgame dungeons or areas by way of acquiring reputation, special keys, or any other special access

How much time do you spend, or have you spent fighting other players?

55. Acquiring special items, or "drops" specifically for the purposes of PvP
56. Engaging in PvP combat specifically for the purposes of gaining honor, faction points, or any other type of ranked or unranked standing
57. Dueling other players of the same or opposing faction
58. Engaging in PvP battlegrounds, factional, or guild battles
59. Randomly engaging in PvP during small, unexpected encounters of enemy, or otherwise attackable players

You're done with over 2/3rds of the survey, it's all small sections from here on out.

next>>

Part 4/8: Your Ideal Guild.

Instructions: Picture your ideal guild. How important are these following things in that ideal guild? Answer choices range from 1 (one) to 5 (five). One means "very unimportant," two

means “unimportant,” three means “neither unimportant nor important,” four means “important,” and five means “very important.”

60. Number of maximum level players in the guild
61. Frequent guild raids, dungeon attacks, or mob swarms
62. Large time commitment expected
63. Prevalence of account sharing or availability of alts (alternate characters)
64. That my guildmates (fellow guild members) respect my ability to play my character type effectively
65. That I can talk to my guildmates about personal issues
66. That my guild has entertaining, humorous, or exciting conversations
67. That my guildmates (fellow guild members) respect me as a person
68. That I can have high status in my guild

next>>

Part 5/8: The Power of the Dark Side.

Instructions: The following questions ask how frequently you do the following. Answer choices range from 1 (one) to 5 (five). One means “very infrequent/never,” two means “infrequent,” three means “neither infrequent nor frequent,” four means “frequent,” and five means “very frequent.”

69. Verbally harass other players

70. Repeatedly kill, or “gank” certain players

71. Kill, or “gank” characters of a far lower level than you

72. Force other players to do what you want them to

73. Scam other people, taking their money or equipment

74. “Ninja loot”, or taking items which you do not need, or from “mobs” which you did not kill

next>>

Part 6/8: Friends.

Instructions: Do you interact more with RL friends, or with in-game friends? Answer choices range from 1 (one) to 5 (five). One means “very infrequent/never,” two means “infrequent,” three means “neither infrequent nor frequent,” four means “frequent,” and five means “very frequent.”

How often does the following happen in the game with friends you know in real life, who you initially met outside of (MMO name – e.g. “EverQuest”)?

75. Spend time playing with their characters

76. You have a meaningful conversation

77. You have a less than meaningful conversation

78. They offer up support for a real life problem

How often does the following happen in the game with friends or guildmates that you only know through (MMO name – e.g. “EverQuest”)?

79. Spend time playing with their characters

80. You have a meaningful conversation

81. You have a less than meaningful conversation

82. They offer up support for a real life problem

next>>

Part 7/8: Fantasy and Role-Play.

Instructions: How involved in the game do you get? Answer choices range from 1 (one) to 5 (five). One means “strongly disagree,” two means “disagree,” three means “neither disagree nor agree,” four means “agree,” and five means “strongly agree.”

83. I can “get into” (MMO name – e.g. “EverQuest”) quickly

84. The fantasy setting of (MMO name – e.g. “EverQuest”) is very appealing

85. I make up stories and histories for my characters

86. I try new roles and personalities with my characters

87. People who role-play extensively bother me

next>>

Part 8/8: Group vs. Solo Play.

Instructions: Do you prefer gaming by yourself, or with others? Answer choices range from 1 (one) to 5 (five). One means "strongly disagree," two means "disagree," three means "neither disagree nor agree," four means "agree," and five means "strongly agree."

88. I play solo (by myself) more than I play in a group

89. It is important for me to be able to kill monsters without anybody's help

90. It is important for me to be able to achieve my non-combat goals without anybody's help

91. I help other players that are in trouble

finish>>

Upon exiting the questionnaire, respondents will be given a chance to see how their results compare against the results of others. This exit page resembles the following:

Thank you. The information you have given us will be a huge help in advancing understanding of how people play massively multiplayer online games. In return we're going to give you some information on how your answers compare to the answers of others. The following information is provided ONLY for your own entertainment. Don't take this too seriously.

423 other people have taken the survey so far. The charts below might change as more people take the survey. The ID below has been randomly generated and given only to you. You can use it to log in and check your scores later, once more people may have taken the survey. Simply return to this page by entering the following URL:

http://thewebsiteforthesurvey.hawaii.edu/results

Your ID: **Dfkj3q97hglkadjf904qkdjflka93q9**

Chart 1: "Addiction"

This chart shows how your "addiction" scores compare to others who took this survey. Keep in mind that surveys like this are brand new; they probably aren't very accurate. Don't take this information too seriously. It's just provided for fun.

Chart 2: "Engagement"

This chart shows how your "engagement" scores compare to others who took this survey. In theory, an "engaged" person plays a lot, but isn't necessarily "addicted."

Chart 3: Addiction and Engagement combined

This chart simply combines scores for Addiction and Engagement, and then compares your scores to the combined scores of others.

Chart 4: How you spend your time, compared against other players

a. The following chart shows how much time you might spend at side activities, things like exploring or participating in special events.

b. The following chart shows how much time you might spend at non-combat advancement, things like crafting or gathering resources.

c. The following chart shows how much time you might spend advancing combat ability for your character(s), things like grinding or completing quests.

d. The following chart shows how much time you might spend performing different tasks at the endgame, maybe obtaining epic/special weapons or transportation.

e. The following chart shows how much time you might spend fighting other players. This might include getting special PvP drops, dueling, or PvPing in order to build up special kinds of reputation.

Chart 5: Raid guild preference

The following chart shows your preference for a more goal-oriented “raid” guild.

Chart 6: Social guild preference

The following chart shows your preference for a guild that is socially engaging.

Chart 7: Behaviors that might not make you popular

Scamming, ninjaing, manipulation, oh my!

Chart 8: RL

This chart shows you how much you interact with RL friends.

Chart 9: Online friends

And this chart shows how much you interact with online friends.

Chart 10: Immersion

Just how much do you “get into” the game?

Chart 11: Individualism

How much do you play with others? How much do you play with NPCs?

Thank you for participating! If you have friends that would like to participate, then send them the following link! **http://thewebsiteforthesurvey.hawaii.edu/whichever**

If you would like to take the test for a different MMO, then simply start at the survey's main page. If you take the test for another MMO it won't be counted in the actual survey. Thank you again for taking the survey. Happy hunting.

Appendix C: Revised Structural Characteristic Composites

Game Elements

Side Activities

1. Exploring new areas
2. Taking time to find (MMO name – e.g. "EverQuest")'s Easter eggs (hidden/for-fun features)
3. Taking time for (MMO name – e.g. "EverQuest")'s special events (for example, in World of Warcraft, the St. Valentine's day screenshot contest)
4. Taking screen shots of (MMO name – e.g. "EverQuest") scenery/architecture
5. Helping out other players

Non-Combat Character Advancement

6. Making Money
7. Crafting items or equipment
8. Acquiring resources or components
9. Acquiring items or recipes that improve your ability to craft

Combat Character Advancement

10. Acquiring items that improve your combat ability
11. Completing quests in order to gain experience
12. Grinding (Killing mobs/monsters that are not quest-related, or not needed for a quest) in order to gain experience
13. Transit between different combat objectives

Endgame Advancement

14. Acquiring a form of endgame transportation (for example, Epic Mount in World of Warcraft, or AV-21 Landspeeder in Star Wars Galaxies).
15. Acquiring epic/endgame items or recipes that improve combat abilities
16. Acquiring epic/endgame items or recipes that improve non-combat abilities
17. Gaining access to special endgame dungeons or areas by way of acquiring reputation, special keys, or any other special access

PvP Advancement

18. Acquiring special items, or "drops" specifically for the purposes of PvP
19. Engaging in PvP combat specifically for the purposes of gaining honor, faction points, or any other type of ranked or unranked standing
20. Dueling other players of the same or opposing faction
21. Engaging in PvP battlegrounds, factional, or guild battles
22. Randomly engaging in PvP during small, unexpected encounters of enemy, or otherwise attackable players

Guild Goal-Orientedness

23. Number of maximum level players in the guild
24. Frequent guild raids, dungeon attacks, or mob swarms
25. Large time commitment expected

Guild Sociability

26. That my guildmates (fellow guild members) respect my ability to play my character type effectively
27. That I can talk to my guildmates about personal issues
28. That my guild has entertaining, humorous, or exciting conversations

29. That my guildmates (fellow guild members) respect me as a person

30. That I can have high status in my guild

Manipulation

31. Verbally harass other players

32. Repeatedly kill, or "gank" certain players

33. Kill, or "gank" characters of a far lower level than you

34. Force other players to do what you want them to

35. Scam other people, taking their money or equipment

36. "Ninja loot", or taking items which you do not need, or from "mobs" which you did not kill

RL Friends

37. Spend time playing with their characters

38. You have a meaningful conversation

39. They offer up support for a real life problem

Online Friends

40. Spend time playing with their characters

41. You have a meaningful conversation

42. They offer up support for a real life problem

Immersion

43. I can "get into" (MMO name – e.g. "EverQuest") quickly

44. The fantasy setting of (MMO name – e.g. "EverQuest") is very appealing

45. I make up stories and histories for my characters

46. I try new roles and personalities with my characters

Individualism

47. It is important for me to be able to kill monsters without anybody's help
48. It is important for me to be able to achieve my non-combat goals without anybody's help

Appendix D: Criteria for Gambling Addiction

American Diagnostics and Statistical Manual for Mental Disorders' IV (DSM-IV) criteria for problematic gambling (American Psychological Association, 1994, Young, 1996)

1. Persistent and maladaptive gambling behaviour as indicated by five (or more) of the following:
2. is preoccupied with gambling (e.g., preoccupied with reliving past gambling experiences, handicapping, or planning the next venture, or thinking of ways to get money with which to gamble)
3. needs to gamble with increasing amounts of money in order to achieve the desired excitement
4. has repeated unsuccessful efforts to control, cut back, or stop gambling
5. is restless or irritable when attempting to cut down or stop gambling
6. gambles as of a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)
7. after losing money gambling, often returns another day to get even ("chasing" one's losses)
8. lies to family members, therapist, or others to conceal the extent of involvement with gambling
9. has committed illegal acts such as forgery, fraud, theft, or embezzlement to finance gambling

10. has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling
11. relies on others to provide money to relieve a desperate financial situation caused by gambling
12. The gambling behaviour is not better accounted for by a Manic Episode.

Appendix E: Criteria for Internet Addiction

1. Do you feel preoccupied with the Internet (think about previous on-line activity or anticipate next on-line session)?
2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
5. Do you stay on-line longer than originally intended?
6. Have you jeopardized or risked the loss of significant relationship, job, educational or career opportunity because of the Internet?
7. Have you lied to family members, therapist, or others to conceal the extent of involvement with the Internet?
8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?

Appendix F: Sample Research Guidelines for MMO Games

Five Standard Practices

1. Describe who you are, and your connection to the participant.

2. Describe what, specifically, you are researching.

3. Tell respondents who will be seeing the data. Attempt to share this data with respondents, in whatever form possible.

4. Describe any relevant training you have in research ethics, and whether your study has been approved by your college's IRB.

5. Describe all of the above simply.

Eight Standard Principles:

1. Approach all members of the gaming community with respect and honesty.

2. Obtain informed consent from all who chose to participate in the study.

3. Do not divulge or report any information shared in private conversations without obtaining explicit approval from the person being quoted.

4. Guarantee confidentiality to all study participants.

5. Guarantee anonymity to all participants who do not wish to have their identities made public. This means that we will preserve the anonymity of game players and their game

characters by using pseudonyms and removing all identifying information from the transcripts.

6. Do not do anything that could potentially harm participants.

7. Do not interview anyone under the age of 18 without receiving explicit parental consent.

8. Give something back to the community by making our results available at the end of the semester.

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