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A study on the relationship between character level and positive reinforcements (that have been shown to lead to addiction) in World of Warcraft

Introduction

The prominent issue with video games these days is addiction, the bind it has on people, and how lives are virtually ruined by them. One of the big names in video games, and the issue surrounding video game addiction, is World of Warcraft. The game has spawned millions of subscribers, a portion of who are addicted to the point where they have lost relationships, terminated friendships, and even lost their job. The problem has become so big that online sites like WOWDetox emerged as a community for people to post their stories about their WoW addiction and how it has affected their lives. Stories like, "I was addicted for 3 years. It took me 4 tries over 2 years to quit" (WoW Detox). Addiction, as defined by the American Society of Addiction Medicine is "a chronic disease of brain reward, motivation, memory and related circuitry. Addiction is characterized by inability to consistently abstain, impairment in behavioral control, craving, diminished recognition of significant problems with one's behaviors and interpersonal relationships, and a dysfunctional emotional response" (American Society of Addiction Medicine). The

American Society of Addiction Medicine does not endorse the notion of “video game addiction”, however their definition of addiction seems to suggest otherwise.

In an extreme case of addiction, a 13-year-old boy, from Beijing, committed suicide after playing 36 uninterrupted hours of WoW. His decision to take his own life was later clarified in his suicide note when he explained he wanted to “Join the heroes of the game he worshiped” (Associated Press). Addiction within the world of online videogames became more recognized in 2008 when the Federal Communications Commission (FCC) alleged games like WoW for being “One of the top reasons for college drop-outs in the US” (Tate). This study analyzes what elements, or positive reinforcements, make World of Warcraft so addicting. The American Society of Addiction Medicine defines a positive reinforcement as, “the creation of a positive emotional state (“euphoria”)” (ASAM). Past studies have shown that World of Warcraft has a multitude of these positive reinforcements. These studies analyze, in-depth, a single factor or specific positive reinforcement in the game, but no one study has compared these positive reinforcements against each other to show which ones are most addicting. This study identifies nine positive reinforcements that have been proven from past studies to engage players of WoW in addictive behavior to the game. This study addresses the question: is there a relationship between level of character and how satisfying specific positive reinforcements are to a player?

Positive Reinforcements

Previous studies show two overwhelming trends in what makes certain features of the game a positive reinforcement. These two trends are: accomplishment and fulfillment of

social needs. Players “love conquering something unbeatable... feeling accomplished that they conquered a raid, achievement, rank, or level” (Tidwell). People engage in a virtual world that feels all too “real” (Snodgrass). Players derive a sense of “individuality” (Snodgrass) from the game that some may not experience in the real world. The game also provides an engaging social environment that “brings friends closer together emotionally as well as physically” (Tidwell) and even serves as a means for “developing new friendships” (Tidwell). The nine positive reinforcements described below were organized based on common trends found in research. All nine of these positive reinforcements relate to each other, further contributing to how powerfully addicting WoW is.

Leveling Up

When one levels up, the character unlocks new abilities, becomes stronger (more health, mana, rage, increased attack), obtains better equipment, and also unlocks the ability to experience new in-game activities that require the higher level that was obtained. Also, players may experience new features and functions of the game. The primary example of this is, of course, is the ability to raid at level 85. Leveling up gives the player a large sense of accomplishment.

Earning better equipment

Earning better equipment provokes a strong sense of accomplishment with players, specifically because earning better equipment is achieved after finishing a quest, defeating strong enemies, finding items in chests, and after accomplishing a raid.

Earning Coin

Obtaining coin in the game is always present, and can always derive a sense of accomplishment. A player earns coin by extinguishing enemies, completing quests, and by selling possessions according to value. The advantage players have with more currency is they can purchase better equipment, new abilities, and similarly to other mediums, including real life, with more money players obtain a higher sense of "power" (Tidwell).

Competing in PvP and the thrill of winning PvP battles

This positive reinforcement is unique in the sense that it is exemplary of both accomplishment and fulfillment of social needs. One player describes the sensation of player vs. player PvP battles as "very rewarding leading a group of 10+ people through a series of challenges, and working out puzzles involved in handling various encounters" (Tidwell). PvP battles award players with in game achievements that ultimately attribute to their rank around the world. This unique combination of positive reinforcements makes PvP battles one of the most exciting and addicting features of the game.

Camaraderie: playing with people who are your real life friends

One study in particular researched the powerful social interface of WoW and how it keeps millions of players logging millions of hours into playing the game. One gamer from this study that researched how social interaction in the game is a strong positive reinforcement said how, "playing with online and faraway [real life] friends and [b]eing able to hangout and do things with friends online even when the weather is terrible, or you're sick, or you're 5,000 miles away from each other is one of the greatest things in the world"

(Tidwell). The ability to play with real life friends has helped players “improve” (Tidwell) their relationships by being able to accomplish various tasks such as raiding together, PvP-ing together, joining and participating in guilds, or simply completing quests together. A researcher from that same study noted in her analysis that, “WoW provides an opportunity for a player to increase the depth and breadth of one’s friendships, at times providing the vital link of shared experience, that helps involve both parties in a relationship” (Tidwell). This positive reinforcement, like the one above, is again a unique combination of accomplishment and fulfillment of social needs.

Camaraderie: playing with people who are only your virtual friends

This positive reinforcement has very similar features to the “Camaraderie: playing with people who are your real life friends” positive reinforcement. What differentiates these two is the idea that since WoW has “10.2 million subscribers” (Holisky) there are many people to meet and play with, providing the opportunity to make new friendships within the game with people who may not even live on the same continent as another player. Analysis by one researcher from a previous study that collected responses from various WoW types of WoW players states that, “WoW provides players a place to be themselves and socialize with real-life friends while expanding their networks to include people they meet in game” (Tidwell). Some players find this experience to be just as rewarding as playing with real life friends as players gain a better sense of identity. One study that researched WoW virtual communities names this the “Utilitarian experience” (2) meaning

“Identification is basically derived from a sense of reciprocity. When online community members believe that they can perform their tasks better (i.e. earning

higher scores in a game, or becoming more knowledgeable or proficient in product use) by acquiring related information, or receive feedback by contributing their knowledge to the virtual community, they are more likely to identify with the community” (Chiu-Ping Hsu et al). Again, this positive reinforcement has both qualities of accomplishment and fulfillment of social needs.

Accomplishing Quests

The idea behind this positive reinforcement is quite simple. The sheer pleasure from completing a quest drives a sense of accomplishment. It grants the player more experience, which leads to leveling up, more often than not it gives the player more gold that leads to buying better equipment, and sometimes accomplishing quest directly gives the player an option to choose a selection of better equipment.

Earning in-game achievements

This positive reinforcement grants the player the very basic sense of accomplishment. More importantly, these in-game achievements contribute to a player’s online ranking, which strongly correlates to the “Personal Connection to the game” positive reinforcement.

Personal Connection to the game (player’s character, the story, festivals)

Perhaps one of the strongest positive reinforcements in the game, various studies have examined the “escaping” (Tidwell) qualities of WoW. This positive reinforcement is comprised of two factors. The first, dissociation and absorption: “some players are able to use game absorption and dissociation therapeutically, with those dissociating deeply

reporting that such experiences enhance their perception that *WoW* contributes to their happiness and life satisfaction” (Snodgrass). The ability to become absorbed in this virtual reality and to escape “real life stressors” (Snodgrass) becomes very therapeutic. The second, individuality and identification: many players create characters that either represents himself or herself or a projected image of who they want to be (an alter-ego). This drives a sense of connection to the character and engages the player in “identifying with the character according to player choices” (Snodgrass). Due to *WoW*’s various sources of customization, “membership in one of two warring factions (the Alliance or the Horde), a race (like elf or orc) and a class (warrior, mage, priest, etc.), lends players greater depth and individuality” (Snodgrass). The extent to which *WoW* contributes to a persons fulfillment of social needs is that people, who may be shy, or have social anxieties in the real world feel more comfortable opening up in the virtual world, one player in a previous study comments, “I’m not being judged on my looks, my clothes, my age, or my mannerisms but am instead judge[d] purely on my own opinions, advice I may give, and skill at the game” (Tidwell). Role-playing servers take this concept one step further, where players typically engage in great racial identification and go as far as “speaking” the races language (Orc language, for instance.) Furthermore, many serious player of the game take great pride in their character(s) and strive to be the best at it. In essence the majority of the previous positive reinforcements mentioned contribute to this (earning in game achievements, PvP, accomplishing quests, earning gold).

Research Method

Measures

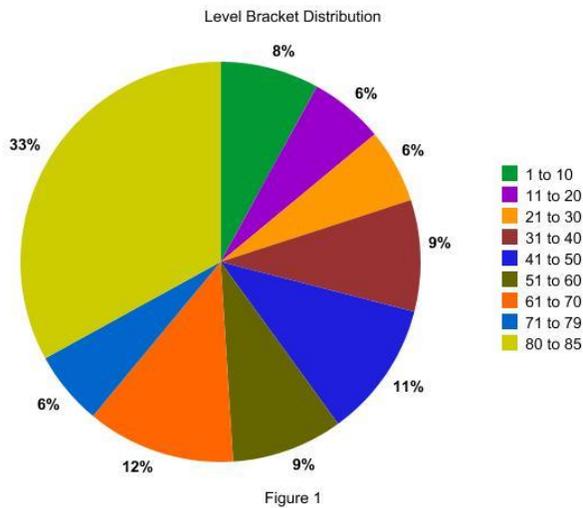
For measuring the positive reinforcements relationship to character level both quantitative and qualitative data was captured. The quantitative data was captured by developing Likert scales ranging from “Very Unsatisfying” (1) to “Very Satisfying” (5) for each positive reinforcement.

The qualitative data was captured by asking subjects seven open-ended questions. These questions attempted to do one of two things. The first: to determine which positive reinforcements are most satisfying to participants (questions 4, 5, 6, 7). The second: to try and identify any additional variables that make the game satisfying for players.

Sampling and data collection procedures

The Likert scales were combined with seven open ended questions in a survey format. The survey was created on www.surveymonkey.com and distributed on several World of Warcraft forums. A link to the survey was distributed to the following forums: illiDrama, Gameaxis, Ten Ton Hammer Forums, and ZAM. Since this study focuses on players who play an online game, a web-based survey is the most effective choice for surveying appropriate participants. All respondents were either members of the online community or outsiders looking at the forums threads. Participants were informed that the survey was only for academic purposes. The idea was to get participants from all different levels, all different races, and all different classes.

Of the 84 responses received, 66 of them were useful. Results were categorized based on level and organized by “level brackets” (see figure 1).



In addition to this data, Brian (one of the researchers), who has never played WoW before this study, played the game and kept a journal. The journal contains his personal thoughts of the game and in addition to that he kept track of how many levels he has gained and any in game achievements accomplished. Chris (the other researcher), who has played the game before, also wrote the same journal entries based on his experiences with the game. Also, each time Chris or Brian accomplishes one level set they will take the survey that is to be passed out to other participants. This will provide us with progressive research on two subjects, providing us with data that could more easily show us how positive reinforcement changes by level. The personal journal adds more in depth insight and more powerful qualitative data.

The qualitative data was assessed by identifying key words and phrases that point to (either directly or indirectly) which positive reinforcement is most satisfying to the player.

Results

Quantitative

Initially a one-factor ANOVA test was performed on the means of all the positive reinforcements (this includes all levels) to determine whether certain positive reinforcements were more satisfying than others across all level sets. The test produced a p-value of .0043, which is below the chosen significance (α , alpha) level of .05. What can be concluded from this test is that the mean values (μ , mu) corresponding to each positive reinforcement are not equal to one another. This is significant because it means that certain positive reinforcements were more satisfying than others across all level sets (see table 9).

Positive Reinforcement	μ	Standard Deviation
Leveling up	4.0	1.01
Earning Gold	3.6	1.06
Getting better equipment	3.9	1.12
Competing in PvP and the thrill of winning PvP battles	3.4	1.45
Camaraderie: playing the game with people who are your real life friends	3.9	1.25
Camaraderie: playing with people who are only your virtual friends	3.6	1.18
Accomplishing quests	3.4	1.12
Earning in-game achievements	3.5	1.34
Personal Connection to the virtual world (your character, the story, festivals)	3.1	1.16

Table 9

After the ANOVA test was performed a post-hoc analysis of pairwise t-tests was conducted to determine which positive reinforcements were the most satisfying across all level sets. The pairwise t-tests compare the mean values (μ , μ) for each positive reinforcement against each other and says whether or not one positive reinforcement compared to another was more satisfying. The numbers in parentheses are the p-values, the alpha level of choice is .05, because this is a standard measurement. A p-value below .05 means that one positive reinforcement was more satisfying than the other: the positive reinforcement with the greater mean is more satisfying than the other.

The post-hoc analysis of pairwise t-tests revealed that Leveling up had a greater mean than Personal Connection to the virtual world (your character, the story, festivals) ($p=.0002$), Competing in PvP and the thrill of winning PvP battles ($p=.0109$), Accomplishing quests ($p=.0177$), and Earning in game achievements ($p=.0349$). Essentially this says that regardless of a player's level, Leveling up was much more satisfying than Personal Connection to the virtual world (your character, the story, festivals), Competing in PvP and the thrill of winning PvP battles, Accomplishing quests, and Earning in-game achievements.

The pairwise t-tests also revealed that Getting better equipment had a greater mean than Personal connection to the game (your character, the story, festivals) ($p=.0009$), and Competing in PvP and the thrill of winning PvP battles ($p=.0349$). Camaraderie: playing the game with people who are your real life friends had a greater mean value than Personal Connection to the virtual world (your character, the story, festivals) ($p=.0016$) and Camaraderie: playing with people who are only your virtual friends had a greater mean

value than Personal Connection to the virtual world (your character, the story, festivals) (p=.0431).

Also, it is worth noting that Earning gold compared to Personal Connection to the virtual world (your character, the story, festivals), Camaraderie: playing with people who are only your real life friends compared to Competing in PvP and the thrill of winning PvP battles, and Getting better equipment compared to Accomplishing quests, all had a p-value of .0530. This is significant because it means that the means for the first positive reinforcement compared to the second one was really close to being statistically significant.

In addition, a one-factor ANOVA test was performed on each individual positive reinforcement to determine whether certain level sets found the positive reinforcements more satisfying than others. If the test revealed that the mean values for each level set were not the same (a p-value of $< \alpha = .05$) then a post-hoc analysis of pairwise t-tests was performed to determine which levels sets differed in how satisfying the positive reinforcement was (again, determined by whether the p-value was $< \alpha = .05$). These pairwise t-tests are presented in tables, and the values in each cell are p-values. The table is read by comparing the level sets on the y-axis to the level sets on the x-axis. If a level set has a greater mean value compared to another level set it therefore would have a p-value below .05. This reveals that the level set with the greater mean value compared to the other level set found the positive reinforcement more satisfying.

First, Leveling up was tested. The ANOVA test revealed a p-value of .0055, so a post-hoc analysis was performed and the pairwise t-test results are presented in table 1.

		21 to 30 2.8	71 to 79 3.5	80 to 85 3.8	51 to 60 4.0	31 to 40 4.3	41 to 50 4.4	61 to 70 4.5	1 to 10 4.6	11 to 20 4.8
21 to 30	2. 8									
71 to 79	3. 5	.1874								
80 to 85	3. 8	.0164	.4645							
51 to 60	4. 0	.0180	.3340	.6214						
31 to 40	4. 3	.0031	.1099	.1648	.4706					
41 to 50	4. 4	.0014	.0675	.0822	.3366	.8303				
61 to 70	4. 5	.0007	.0445	.0423	.2490	.6993	.8628			
1 to 10	4. 6	.0010	.0437	.0520	.2177	.5818	.7140	.8261		
11 to 20	4. 8	.0008	.0301	.0353	.1493	.4202	.5214	.6095	.7795	

Table 1

Second, Earning gold was tested. The ANOVA test revealed a p-value of .1906, so a post-hoc analysis was not performed. This means that not one level set found Earning gold to be more satisfying than another.

Third, Getting better equipment was tested. The ANOVA test revealed a p-value of .9398, so a post-hoc analysis was not performed. This means that not one level set found getting better equipment to be more satisfying than another.

Fourth, Competing in PvP and the thrill of winning PvP battles was tested. The ANOVA test revealed a p-value of .0205, therefore a post-hoc analysis was performed and the pairwise t-test results are presented in table 2.

	21 to 30 2.3	31 to 40 2.5	1 to 10 2.6	71 to 79 3.0	51 to 60 3.3	80 to 85 3.4	61 to 70 3.6	11 to 20 3.8	41 to 50 4.9
21 to 30 2.3									
31 to 40 2.5	.7515								
1 to 10 2.6	.6697	.8925							
71 to 79 3.0	.3871	.5270	.6260						
51 to 60 3.3	.1732	.2405	.3239	.6729					
80 to 85 3.4	.0776	.0992	.1698	.5122	.8564				
61 to 70 3.6	.0702	.0923	.1450	.4052	.6589	.7048			
11 to 20 3.8	.0866	.1170	.1643	.3871	.5979	.6344	.8674		
41 to 50 4.9	.0012	.0010	.0025	.0180	.0282	.0089	.0553	.1521	

Table 2

Fifth, Camaraderie: playing with people who are your real life friends was tested. The ANOVA test revealed a p-value of .0173, therefore a post-hoc analysis was performed and the pairwise t-test results are presented in table 3.

	41 to 50 2.3	1 to 10 2.8	21 to 30 3.3	71 to 79 3.3	31 to 40 3.3	61 to 70 3.5	51 to 60 3.7	11 to 20 4.0	80 to 85 4.2
41 to 50 2.3									
1 to 10 2.8	.4263								
21 to 30 3.3	.1658	.5430							
71 to 79 3.3	.1658	.5430	1.0000						
31 to 40 3.3	.0912	.4250	.9067	.9067					
61 to 70 3.5	.0366	.2673	.7109	.7109	.7793				
51 to 60 3.7	.0273	.1968	.5583	.5583	.6004	.7793			
11 to 20 4.0	.0155	.1081	.3373	.3373	.3500	.4594	.6394		
80 to 85 4.2	.0002	.0138	.1252	.1252	.0998	.1396	.3170	.7707	

Table 3

Sixth, Camaraderie: playing with people who are only your virtual friends was tested. The ANOVA test revealed a p-value of .0287, therefore a post-hoc analysis was performed and the pairwise t-test results are presented in table 4.

	1 to 10 2.2	71 to 79 3.3	21 to 30 3.5	80 to 85 3.6	41 to 50 3.7	61 to 70 4.1	31 to 40 4.2	51 to 60 4.2	11 to 20 4.3
1 to 10 2.2									
71 to 79 3.3	.1132								
21 to 30 3.5	.0511	.7177							
80 to 85 3.6	.0062	.5522	.9020						
41 to 50 3.7	.0102	.4496	.7266	.7240					
61 to 70 4.1	.0010	.1474	.2986	.1664	.4181				
31 to 40 4.2	.0015	.1499	.2929	.1828	.4068	.9371			
51 to 60 4.2	.0015	.1499	.2929	.1828	.4068	.9371	1.0000		
11 to 20 4.3	.0027	.1515	.2802	.1991	.3834	.8346	.8949	.8949	

Table 4

Seventh, Accomplishing quests was tested. The ANOVA test revealed a p-value of .0635, so a post-hoc analysis was not performed. This means that not one level set found Accomplishing quests to be more satisfying than another.

Eighth, Earning in game achievements was tested. The ANOVA test revealed a p-value of .5311, so a post-hoc analysis was not performed. This means that not one level set found Earning achievements to be more satisfying than another.

Finally, Personal Connection to the virtual world (your character, the story, festivals) was tested. The ANOVA test revealed a p-value of .0345, therefore a post-hoc analysis was performed and the pairwise t-test results are presented in table 5.

	11 to 20 2.3	1 to 10 2.4	41 to 50 2.6	21 to 30 3.0	80 to 85 3.1	71 to 79 3.3	51 to 60 3.5	31 to 40 3.7	61 to 70 4.3
11 to 20 2.3									
1 to 10 2.4	.8339								
41 to 50 2.6	.6308	.7837							
21 to 30 3.0	.3219	.4029	.5220						
80 to 85 3.1	.1312	.1685	.2274	.8214					
71 to 79 3.3	.1880	.2375	.3120	.7403	.8360				
51 to 60 3.5	.0733	.0924	.1213	.4685	.4507	.7165			
31 to 40 3.7	.0432	.0535	.0688	.3346	.2750	.5455	.7866		
61 to 70 4.3	.0032	.0034	.0034	.0594	.0128	.1294	.1960	.3131	

Table 5

The second part of the survey consisted of 7 questions constructed in order to more deeply analyze the positive reinforcements in the game. Apart from the predetermined positive reinforcements discussed earlier in the section, these seven questions aimed to capture something that may have been missed.

Question number one: *Describe your main character (level, race, class, server type-PvP)*

**Please do not include character names or any personally identifiable material in your responses*.*

This question was placed in the survey to clarify who was taking it, and to insure that the data collected by the survey was inclusive. An inclusive study means that there was enough information collected across the categories of characters. The categories of characters were also predetermined and were described as:

- (Category 1) **Melee-based:** rogue, warrior, enhancement shamans, feral druids, death knights...(28/84)=33.33%
- (Category 2) **Range/Mage-based:** hunters, mages, priests, warlocks, balance druids, elemental shaman...(25/84)=29.76%

- (Category 3) **Hybrid Class:** paladins, and specified shaman classes...(31/84)=36.90%

If this question wasn't within the survey, there would be no way of knowing if there was a majority of a class, or a lack of one.

Question number two: *How many characters do you have? What is your favorite type of character and why?* Question number two ended up related to question number one and actually supplying a lot of helpful information. It ended up that a lot of responders would clarify their statements made in question number one. There was a large range of responses (see table 6).

Question #2 table of (range of characters per responder)					
# of characters	1-10	11-20	21-30	31-40	41-50
Total responses recorded = 84					
# of responders	31	29	27	3	2
Total responses deemed usable = 66					
# of responders	28	20	15	1	2
Average # of characters per usable responder = 13.46					

Table 6

Question number three: *Do you have any habits while you play the game? For example, do you always drink Rockstar while you play?* This question was put in our survey to see if there was any consistency in what habits our responders had while playing the game. After collecting all of the habits between our usable responses, the results were put into a chart

to organize (see table 7).

Most prominent habits while playing WoW	
Listening to headphones	45.46%
Consuming food and/or beverage	28.64%
Gaming with friends (in person)	12.90%
Posses no usual habits	9.38%
Other	3.63%

Table 7

Question number four: *What was your greatest moment in WoW? Why?* This question was created because it would generate a list of “greatest moments” between our responders.

Question number four generated a multitude of responses that will be analyzed later in the paper. Other notable data that responders discussed about their “greatest moments” included:

- 74.1% of “greatest moments” were achieved with other players
- 22.2% of “greatest moments” were achieved while alone
- 88.9% of “greatest moments” involved conquering others

Question number five: *How do you socialize in WoW? Why do you socialize in the game?*

This question aimed to see how much responders socialized, and how important in-game social experiences were to them. By far, the most prominent use of socialization involved using chat for guilds and raids. Similar to question number four, however, there will be further analysis of personal responses later in the paper. The commonalities that came from this question were:

- Responders who regularly used chat = 70.37%

- Responders who enjoyed putting on a false front, or who enjoyed portraying themselves differently in-game than in real life = 19.04%
- Responders who reported expressing themselves in the game = 24.56%

Question number six: *What is your favorite aspect about WoW? Why?* This question yielded the most individualistic responses. From the variety the most popular are shown in table 8.

1. Raiding	5. Guilds	8. How easy it is
2. The variety of things to do	6. Making money	9. Alone time
3. Freedom to roam	7. Affordability	10. To relieve stress
4. Immersing yourself into a new world		11. Free-time

Table 8

Question number seven: *Why do you play WoW?* The last question of the survey was the most open-ended question of them all. Some notable responses were: “Because no matter what new game I just finished or just got sick of, WoW will always be there. “It’s my ‘in-between game’”; “More bang for your buck than any other game”; “It’s my quality time away from life” were some responses that seemed to be popular and have similarities amongst responders. This question also contains a lot of data that will be analyzed later in the paper.

Analysis

Looking at the quantitative results, the positive reinforcements that were considered to be significant (had a p-value less than .05) included: Leveling up (p=.0055); Playing with real friends (p=.0173); competing in PvP (p=.0205); Playing with virtual friends (p=.0287); and finally the process of immersing yourself into a virtual world (p=.0345).

Looking at the post-hoc analysis for leveling up, the most obvious trend can be found at the bottom left-hand corner of the data table. It would appear that the positive reinforcement

of leveling up is most greatly significant within the level set of (11-20) followed second by the level set of (1-10). One possible conclusion that can be drawn from this is that, when a player is in the beginning stages, levels (1-20), of the game, leveling up is the one of the most rewarding positive reinforcements for the player. This trend was also realized with the personal journal data. Chris's personal playing journal revealed that, "I want to get new spells and keep leveling up...the story bores me." Brian's journal revealed that, "Being new to the game, the first few levels weren't fun to get through, I just want to get through these levels so I can actually do something". It is worth noting that both Brian and Chris only played to level 20.

When looking at the post-hoc analysis for the PvP competing /PvP thrill of winning data table there is only one row of data that is significant. The level set of (41-50) found this positive reinforcement as most satisfying. Another interesting point to note is that the lower level sets (1-10) and (21-30) stayed at the top of the data table. Again the outlier turned out to be the level set of (11-20) as it was out of the lower level cluster. One could conclude competing within PvP battles are not a very satisfying positive reinforcement within the first few level sets. All the short responses from participants yielded the same trend. Most of the participants who mentioned PvP as "*Their greatest moment in WoW*", "*Reason they play WoW*", or "*Favorite aspect of WoW*" were in the mid to high level sets (mid = 31-60, high = 61-85). Participants talked about how satisfying it was "to conquer another" (Participant #31) and the "feeling of accomplishment winning battlegrounds and defeating weaker players" (Participant #18).

The next two data tables in the results section compares how important camaraderie with real friends and virtual friends through the game is at each level set. As it was in the past two data tables, the level set (11-20) appears to be an outlier. Also, one would notice a cluster of higher ranged levels within the significant data of the post-hoc analysis. Amongst the apparent outlier set, the other sets include (61-70), (51-60), and the most significant set (81-85). Based off these observations one could conclude that camaraderie with real friends is vastly more important amongst higher levels, although level set (11-20) was the second most significant level set that found this positive reinforcement to be more satisfying than other level sets. The data for playing only with virtual friends presents an interesting correlation. Every level set, excluding (21-30) and (71-79), all have greater means than level set (1-10). The short response questions on the survey yielded an interesting statistic relative to the quantitative data. When asked the question "*What was your greatest moment in WoW?*" 74.1% of participants claimed that their greatest moment was achieved with others. When asked the question, "*How do you socialize in WoW? Why do you socialize in the game?*" 70.4% of participants said they regularly used chat in the game, and 90.2% of these participants used chat in their guilds. Participants frequently talked about how "socializing is half of what it's all about" (Participant #5) as opposed to simply "playing a solo game" (Participant #5). A unanimous trend in Brian and Chris's personal journal was, "playing with Brian made the game a lot more fun, like I felt like I wasn't grinding the game out. It added a whole new element to the game".

The last positive reinforcement that proved significant compared the level sets in regards to how important personal connection to the virtual world is. The data for this set provided

some interesting data. There is no conclusion to be drawn by merely looking at the significant data in this analysis, but, by looking at the entire table, and overall flow of significance, one can observe that there is a concentration of high levels towards the significant side, and a concentration of lower levels towards the insignificant side. With that observation, one could generalize that personal connection to the virtual world increases as level increases. Participants noted how powerful it is “to immerse yourself in the virtual world, to get away from real life issues” (Participant #14). A more accurate generalization that could be made is that personal connection to a virtual world is more popular within mid-range levels (31-60). This seems odd because as level increases to and within the mid-range level sets participants found connection to the virtual world to be very satisfying but in the high-range level sets (61-85) the data was not so significant and was not as satisfying. There is nothing that can be concluded as to why this is and the question is left up for further research.

The rest of the positive reinforcements including: accomplishing quests ($p=.0635$); earning coin ($p=.1906$); accomplishing in-game achievements ($p=.5311$); and getting better equipment ($p=.9398$) proved to be less significant because they all had p-values above .05. Meaning that no one level set found these positive reinforcements more satisfying than another level set.

Also, an interesting trend in the data was that the lower level sets of (11-20) appeared to be among either one of the most significant or the least significant p-values within the post-hoc analyses. In each positive reinforcement including leveling up; competing in PvP;

Camaraderie with real friends; and camaraderie with virtual friends were either the most significant or second most significant p-value within the analysis, meaning that they were the most satisfying positive reinforcements for players in that level set.

Discussions and Implications

One interesting trend in data that was observed was that all level sets, excluding (71-79) found Leveling up to be more satisfying than level set (21-30). One possible explanation for this could be that we didn't have a large enough sample (12% of the data were in level set 21-30) to accurately represent the level (21-30) population. A possible problem with the data could be that most level sets were not accurately represented because 33% of the data were from participants in the level (80-85) bracket. Also, over 50% of the data was in the high level bracket (61-85), while only 29% were in the mid level bracket (31-60) and only 20% in the low level bracket (1-30). Obviously this could mean our data was not entirely inclusive therefore the data has the ability to be skewed.

The results from the qualitative research proved to be very interesting. Due to the fact that the average number of characters per responder was over 13, along with the fact that most of the responders referenced that they have multiple level 85 characters, one could conclude that there was unquestionably a high level of experience within the group of responders. Also the data from questions number one and two was used in a necessary checkpoint that was conducted to avoid collecting data that was not inclusive. One of the largest possible sources of error is that the data wasn't inclusive, and then the overall data wouldn't be accurate in supporting the research question. In other words, if 85% of the

responder's were generally the same, or perhaps completely similar, that kind of majority would skew the data because of the different habits and abilities that correlate with each different level of character. It can be concluded that the open-ended survey was able to supply accurate data because the data proved inclusive in one fashion. For this study, one of the requirements set for having inclusive data involves having a majority of class (of character) no larger than 50%, and having no minority smaller than 15% within the different pre-determined categories of classification. So one of two requirements to make the data inclusive was met.

In addition, a participant of the survey commented on the forum thread where the link to the survey was posted and gave some advice about improving our survey. The participant expressed that they believe the survey was limited because it only covered basic elements of what makes people play WoW such as "achievement, socialization, and immersion."

(Rawdeal); suggesting that "there are still answers out there to be researched as to why the specific qualities of World of Warcraft keep gamers so interested." (Rawdeal). As a call for further research, one could do an experiment that seeks to find other positive reinforcements that are specific to WoW. The survey attempted to capture some of these other variables with the short-answer questions, but no significant data was identified from this.

The only real world benefit that can be derived from this data is that video game designers have an outline for what positive reinforcements are more significant at each "stage" (level

of character for instance) of a game (MMO's specifically, since this study researched WoW), to keep gamers retention rate high. Although this study specifically studies WoW, the prominent positive reinforcements (the ones' in this study) are consistent in every MMORPG (massively multiplayer online role-playing game).

Conclusion

In response to the research question: is there a relationship between level of character and how satisfying specific positive reinforcements are to a player? This study can conclude that there were different rates of positive reinforcement between low, medium, and high level groups. Evidence of this includes the observations like: when a player is in the beginning stages, levels (1-20), of the game, leveling up is the one of the most rewarding positive reinforcements for the player; PvP battles are a more satisfying positive reinforcement within the mid-range and high level sets; that camaraderie with real friends is vastly more important amongst higher levels; that personal connection to the virtual world increases as level increases; and that personal connection to a virtual world is more popular within mid-range levels (31-60).

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