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<p>Abstract</p> <p>Do you like fishing? Perhaps decapitating an unsuspecting foe on the battlefield with your new - massive - axe of brutal destruction? Or do you enjoy quiet solitude in a lush oasis? Among millions of online game players, chances are low that you will find someone with a play style that mirrors your own. Indeed, research suggests that our individual gaming preferences are unique, and made up by several underlying factors that combined makes up our in-game behavior. So where do these factors come from? The purpose of this study was to examine if personality traits affect the way we play in MUD's and MMORPG's. To examine this three tests were used; two tests for measuring in-game behavior and one test for measuring personality traits. Results showed significant correlations between several of the personality traits and in-game behaviors, indicating that personality traits do affect the way we play. This suggests that we bring part of our real life characteristics into the games we play, and poses an interesting question about how in-game experiences will affect us in real life.</p>	
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Sammanfattning

Blod, guld eller giftermål – vad får igång dig? - en studie av personlighetsdrag och spelbeteenden

en kandidatuppsats av Karin Halvarsson och Daniel Winther

Föredrar du att fiska? Eller kanske hugga huvudet av en icke ont anande fiende på slagfältet med din nya – massiva – yxa? Eller vill du helst tillbringa din tid vid en stillsam oas? Chansen att du bland miljontals onlinespelare stöter på någon med exakt samma spelstil som din egen är i det närmaste obefintlig. Forskning hävdar att vår spelstil är unik och utgörs av ett antal underliggande faktorer som tillsammans avgör hur vi spelar. Så varifrån kommer faktorerna? Syftet med studien var att undersöka om personlighetsdrag påverkar hur vi spelar MUD och MMORPG-spel. För att undersöka detta användes tre test; två test avsedda att mäta spelstilar och ett test för att mäta personlighetsdrag. Resultatet visade signifikanta samband mellan ett flertal personlighetsdrag och spelstilar, vilket indikerar att personlighetsdrag påverkar hur vi spelar. Det antyder att vi tar med oss delar av våra karaktärsdrag in i spelen vi spelar och leder till frågan om hur våra upplevelser i spelet påverkar oss i verkliga livet.

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1. Introduction

“Part of the reason I play online games is to experience a sense of achievement. When I put a good deal of time and effort into an in-game task, I am rewarded in a way that's meaningful and measurable: I gain a new item, I finish a difficult quest and get experience points or money, I gain a higher level of proficiency in a skill or ability, or I gain notoriety in the virtual game community. The real world isn't like that. In the real world, there are few quantitative rewards for the effort one puts out merely 'to live'. In the real world, you have to run errands, shop at the grocery store, clean your house, do your taxes, keep all your papers organized, do the laundry, etc. etc.. There is no sense of 'achievement' or forward progression in these things -- they are merely daily must do's. There is no sparkly new item or new skill waiting for me after I do my 6th load of laundry in a week.”

[Female, 37, World of Warcraft]

This narrative is an excerpt from an interview from The Daedalus Project, an online survey project collecting data from over 40,000 Massively Multiplayer Online Role-Playing Game (MMORPG) players over six years. The interviewee is talking about the appeal of gaming to her; more specifically, why she prefers achieving things in an online game rather than in real life.

Prior research in the area of gaming motivations is thin, with The Daedalus Project being the most extensive. The founder of the project, Nick Yee, is an American researcher with a Ph.D. in Communication from Stanford, and also one of the most prominent researchers in this field. In 2005, Yee found a phenomenon he called the “mirroring effect”, suggesting that people tend to customize their in-game characters to resemble their real life appearance; e.g. taller people choosing slightly taller avatars, females choosing avatars with more feminine characteristics. Also, depending on your gaming motivations you may chose a small, cute avatar, or a big and scary one. Additionally, Yee (2005) noted that women tend to take on supportive roles (e.g. healing) more often than men. This is the case for Amelia, a 31 year old female playing World of Warcraft, who enjoys playing together with her boyfriend, trying to keep his character alive.

The pioneer in Multi-User-Dungeon (MUD) and MMORPG research is Dr. Richard Bartle, currently teaching game design at the University of Essex, who did the first studies of player types in games. His work laid the groundwork for Yee's research, and most research concerning games in general (Bartle, 2007). While the purpose of Bartle's work was to improve game design, Yee strives to understand the motivations that make up in-game behavior. The underlying causes behind Bartle's and Yee's theories, why we play the way we do, is an area fairly unexplored.

1.1 Background

1.1.1 Multi-User-Dungeons

Most MUD's origin from Trubshaw's game called “MUD” created in 1978, this name has since been used to name the whole genre (Bartle, 1996). Traditional MUD's implement a fantasy world where players can choose to play different characters, obtaining a set of specific skills or powers. MUD's differ from other computer games by its persistent worlds; when a player stops playing the world continues to exist and evolve. The object of MUD's is typically to slay monsters, explore the world, participate in a role playing story and progress with your created character. However, MUD's have also been used for distance education or

virtual meetings, and also for the sole purpose of socializing. Most MUD's are run as part-time projects or hobbies by programmers, and are usually free of charge. They are accessed through the standard TELNET application, or through special MUD clients developed by players to provide an improved user experience.

1.1.2 Massively Multiplayer Online Role-Playing Game

MMORPG is a genre of computer games where the player interacts with other players in a fictional world over the Internet. This genre evolved from MUD's in the early 1990s and is in essence a MUD with added graphical interface (Bartle, 2007). Just like in MUD's, each player in an MMORPG assumes the role of a character and controls the characters actions (Anissimov, 2007). Similarly, the object of an MMORPG is to slay monsters, explore the world, socialize and progress with your character. The number of players are more extensive in MMORPG's than any other genre. Examples of popular MMORPG's are World of Warcraft, EverQuest and Anarchy Online. World of Warcraft is the largest MMORPG today and it alone has 11.5 million monthly subscribers (Blizzard Entertainment, 2008).

1.2 Problem

“...if we don't understand why players are in these online worlds to begin with, then we can never truly appreciate the more complex phenomena that emerge from these environments.”

(Yee, 2005)

The above quote comes from MMORPG researcher Nick Yee who has done extensive research on player motivations in games. While Richard Bartle identified four player types that attempts to explain *how* people play, Yee has taken it one step further and attempted to explain *why* they play. His focus is on how the individual benefits from playing in terms of real life satisfaction, not necessarily how he acts it out inside the game. Their combines research has shown that people play differently in MUD's/MMORPG's, and also that people play for different reasons. What remains unclear is why players have different behaviors when playing, and where these behaviors come from. Personality traits are one factor that influence our behavior in the real world, but does it also influence the way we act in the in-game world?

1.3 Purpose

The purpose of this study was to examine if personality traits affect the way we play in MUD's and MMORPG's. Participants were current or former players of MUD's or MMORPG's, no discrimination was made on age, sex or demography.

2. Method

The study used a combination of three tests, one test for measuring personality traits and two tests for measuring gaming motivations. Data was collected through online participation, among current or former players of MUD's or MMORPG's.

2.1 Participants

Participants were self-selecting through completion of two web-based forms. The forms were distributed through Internet-based channels such as the chatprogram MSN, the homepages Facebook (www.facebook.com), Elvenrunes (www.elvenrunes.com), World of Warcraft forums (forums.wow-europe.com) and the Mudconnector forums (www.mudconnect.com).

For the first form, 474 questionnaires were collected, 33 were excluded for failing to add the Bartle Quotient. For the second form, 489 questionnaires were collected and none were excluded.

2.2 Materials

The first test was the Bartle-test, consisting of 30 questions listed online, where each question has two pre-written answers. Each answer corresponds to a certain player type (Killer, Achiever, Explorer, Socializer). The answers are summarized and you receive a percentage rating within each player type. This percentage rating is called the "Bartle Quotient", and totals 200% across all player types with no single type exceeding 100%; for example, Killer: 80%, Achiever: 60%, Socializer 40%, Explorer 20% (Mulligan & Patrovsky, 2003). This is an independent test available online¹.

The second test was the Big Five Inventory (BFI), a scale created by Dr. Oliver P. John at University of California. BFI is a self-report inventory designed to measure the Big Five personality traits. BFI measures the answers on a 5-point scale, from "Strongly Disagree" to "Strongly Agree". Each answer is graded with 1-5 points, and all points within the same trait are later summarized to get a measurable result. The traits measured were those of the original Big Five personality traits: Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism (see Appendix A).

The third test was the Yee Gaming Motivations test. It consisted of 29 questions and is a self-assessment questionnaire designed to measure individuals' different motivations for playing MMORPG's. The Yee Gaming Motivations test measures the answers on a 5-point scale, from "Strongly Disagree" to "Strongly Agree". Each answer is graded with 1-5 points, and all points within the same category are later summarized to get a measurable result. The components measured were Achievement, Social and Immersion and their respective subcomponents (see Appendix B).

2.3 Procedure

For the first form, each respondent first completed the Bartle Test online to receive a Bartle Quotient. After completing the Bartle Test the respondents were asked to go to a second website to take the BFI². One question was added to the BFI for the respondent to fill in their

¹ <http://www.gamerdna.com/quizzes/bartle-test-of-gamer-psychology>

² <http://www.my3q.com/home2/271/magiska1/15915.phtml>

Bartle Quotient. The form took less than 15 minutes to complete. Data was collected over a one week period. Correlations between the Bartle player types and the Big Five personality traits were calculated in SPSS (Statistical Package for the Social Sciences).

The second form consisted of the Yee Gaming Motivations test and the BFI test combined into a single form. Respondents were asked to go to a website and complete the questionnaire³. The form took less than 15 minutes to complete. Data was collected over a 36 hour period. Correlations between each component and the Big Five personality traits were calculated in SPSS.

³ <http://www.my3q.com/home2/271/magiska1/62952.phtml>

3. Theoretical Framework

3.1 The Bartle Test

In 1989, a discussion commenced in a commercial MUD in the UK. The question was: “What do people want out of a MUD?”. The debate continued for over half a year, and consisted of hundreds of bulletin-board postings where players explained why they played and what changes they thought would improve the game. At the time, Richard Bartle was the senior administrator of this MUD, and it fell on him to finally summarize the discussion and try to draw conclusions from the various opinions. (Bartle, 1996)

He found four things that people typically enjoyed about playing MUD's. From these he derived four general player types that can be said to populate a MUD. Bartle suggests that while these player types often cross over into each other depending on the players mood or current playing style, most players do have a primary style and will only switch to other styles if they can gain something from it. (Bartle, 1996)

The Bartle-test is a series of questions that classifies players of MUD's and MMORPG's into categories based on their gaming behavior. While the test was originally created by Richard Bartle to classify player types of MUD's, with the purpose of helping MUD-designers build better MUD's (Bartle, 1996), it has been modified and modernized to include player types in today's MMORPG's. The test was organized into electronic form by Erwin Andreasen in 1996, and has since then been taken by over 500,000 game players. The result gives the player a percentage result within four given categories: Achiever, Explorer, Socializer and Killer. The percentage indicates the players gaming preferences relative to any other area of interest, or in short: how we play.

3.1.1 Achievement in the game context

“Players give themselves game-related goals, and vigorously set out to achieve them. This usually means accumulating and disposing of large quantities of high-value treasure, or cutting a swathe through hordes of mobiles (i.e. monsters built in to the virtual world).”

(Bartle, 1996)

For the Achiever everything is goal-oriented, everything is a means to an end. The Achiever will focus her energy on gathering points, gaining levels or find increasingly powerful items. While she can temporarily explore or socialize, it is always for the purpose of gaining something (i.e. finding new sources of treasure or finding out how other people gather points).

An Achiever may say things like:

- “I'm busy”
- “Sure, I'll help you. What do I get?”
- “Only 3 levels to go!!”

(Bartle, 1996)

3.1.2 Exploring the game

“Players try to find out as much as they can about the virtual world. Although initially this means mapping its topology (i.e. exploring the MUD's breadth), later it advances to experimentation with its physics (i.e. exploring the MUD's depth).”
(Bartle, 1996)

The Explorer likes to find out how things work. They are curious about the in-game world, where to find things and what different things do. They can often be found in strange places doing unexplainable things looking for new features or bugs in the code. The Explorer has the most fun exploring things and delights in knowing a lot of secrets that no one else knows of.

An Explorer may say things like:

-“I haven't tried that one, what does it do?”

-“Why is it that if carry the uranium you get radiation sickness, and if you put it in a bag you still get it, but if you put it in a bag and drop it, then wait 20 seconds and pick it up again, you don't?”

(Bartle, 1996)

3.1.3 Socializing

“Players use the game's communicative facilities, and apply the role-playing that these engender, as a context in which to converse (and otherwise interact) with their fellow players.”

(Bartle, 1996)

Socializers are mostly interested in other players and what they have to say. The game is a place like any other, where you can meet and interact with people. Focus is not on the game itself, rather on the people playing. For the Socializer the fun comes from listening to other people, joking, entertaining, empathizing with them, and observing people play.

A Socializer may say things like:

-“What happened? I missed it, I was talking.”

-“Yeah well, I'm having trouble with my boyfriend.”

-“Oh I haven't seen you for so long!! How was your christmas?”

(Bartle, 1996)

3.1.4 Killer

“Players use the tools provided by the game to cause distress to (or, in rare circumstances, to help) other players. Where permitted, this usually involves acquiring some weapon and applying it enthusiastically to the persona of another player in the game world.”

(Bartle, 1996)

According to Bartle there are two different kinds of Killers, both are players who impose themselves upon others but in different ways. The first kind is uncommon, and imposes herself on others by being too kind and caretaking. The more common approach by the Killer is imposition through attacking other players, or otherwise causing distress. The more distress, the merrier! They enjoy knowing that what they just did has upset someone, and that this someone can do nothing about it.

A Killer may say things like:

-”DIE!”

-”Coward!!”

(Bartle, 1996)

3.2 Yee Gaming Motivations

In the last six years Nick Yee has studied players of MMORPG's and their interaction in virtual environments through The Daedalus Project. When asking players why they played MMORPG's, Yee found a great variation of motives. He suggests that MMORPG's may be appealing to many players because these games offer a great variety of play styles (Yee, 2007). From the qualitative data gathered from his surveys, and with the Bartle player types in mind, he created an list of questions that related to gaming motivations among players of MMORPG's. This inventory, in this paper referred to as the “Yee Gaming Motivations”, provides a foundation for future quantitative research in MMORPG's by providing a model to assess gaming motivations of players.

There are some fundamental differences between the Bartle player types and the Yee Gaming Motivations that are worth noting. The questions of the Bartle Test focus on different situations in the game and how you would react or what choices you would make while playing. The questions of the Yee Gaming Motivations focus on what you find important and entertaining in the game. Furthermore, Yee suggests that Bartle grouped elements of play together that may not be related to each other. For example, the Bartle Socializer contains elements of both chatting and role-play (Yee, 2005). Yee consider these two elements as separate motivations, but group them together under the same overarching component. Also, Bartle (1996) claimed that you can adopt different player types and that most players have a primary type that remains constant. He also suggests that the different play styles suppress each other; the more Achiever you are, the less Socializer. Yee (2005) is of the opinion that one play style does not necessarily suppress another.

The Yee Gaming Motivations consists of three main components, each consisting of several subcomponents. The subcomponents focus on different aspects of play but are not seemingly related to each other. The different subcomponents co-exist and together reveal the motivations of a player (Yee, 2005).

Achievement	Social	Immersion
Advancement	Socializing	Discovery
Mechanics	Relationship	Role playing
Competition	Teamwork	Customization
		Escapism

Figure 1. The components of the Yee Gaming Motivations with their related subcomponents. (Yee, 2007)

3.2.1 Achievement

The first component is the Achievement component, with subcomponents Advancement, Mechanics and Competition. The common denominator of these components is power, or harnessing power. For the Advancement subcomponent the greatest motivators are progress and status, for Mechanics it is about planning, optimization and creating templates to maximize your gains. Players who fall under the Competition subcomponent enjoy the

derivation of power that comes from competing with other players. Challenging other players, provocation and domination also falls into this subcomponent.

3.2.2 Social

For some individuals the greatest motivation for playing is spending time in an environment where you can always find someone to talk to. The Social component consists of the subcomponents Socializing, Relationship and Teamwork. Some people just want to chat casually for the sake of chatting (Socializing), while others have a desire to form personal relationships (Relationship). A third category of Social players are those who gain satisfaction from collaborating within a group (Teamwork). (Yee, 2005)

3.2.3 Immersion

The Immersion component is about getting immersed in the gaming environment, living in the game for a little while. Discovering new areas of the game, knowing things that other players do not, and finding hidden things are all parts of the Discovery subcomponent. Players who fall under the subcomponent Role playing enjoy being part of the storyline and creating well-developed backgrounds for their characters. The Customization subcomponent is about creating a character that is appealing to you by customizing its appearance through different hairstyles, skin color or clothing. Finally, the Escapism subcomponent is about leaving real life behind for a while and letting your mind become fully absorbed by the gaming world, perhaps to relax after a tough day at work.

3.3 The Big Five Personality Traits

Personality traits can be defined as habitual patterns of behavior, thought, and emotion (Kassin, 2003). These traits are relatively stable over time, influence behavior and differ among individuals. An individual has more or less of every trait, and the traits are more prominent in some individuals, and less prominent in others. For example, some people are open and outgoing, others are shy. Both behaviors are related to the Extraversion trait where the outgoing person has more of the trait, and the shy person has less. There are potentially an unlimited amount of traits, but many psychologists believe that five traits are sufficient to adequately describe human personality (Costa & McCrae, 1992), these are commonly referred to as the Big Five personality traits.

First mentioned in 1933 in the American Psychological Association by L.L. Thurstone, the Big Five Model is considered to be the most comprehensive data-driven enquiry (Benet-Martinez, 1998). The model is a descriptive five factor model of personality that relates words and behaviors to personality traits. The five traits in the Big Five model are Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism. The five traits each consist of more specific correlating traits. For example; Agreeableness includes such related qualities as having a tendency to be compassionate and cooperative. Extraversion has qualities like sociability, impulsiveness, excitement seeking, and positive emotions included (Benet-Martinez, 1998).

3.3.1 Openness

An individual who register high in Openness generally has a appreciation for art of various kinds and is often creative. They tend to be adventurous and appreciate a variety of experience, have unusual ideas and a vivid imagination. A person high in Openness is more likely to be aware of their emotions and intellectually curious (Benet-Martinez, 1998).

An individual high on Openness may say things like:

- I have a vivid imagination.
- I am quick to understand things.

3.3.2 Conscientiousness

This trait is marked by a tendency to act dutifully and make plans rather than show a spontaneous behavior. People who register high in Conscientiousness have a tendency to show self-discipline and aim for achievement. They are generally successful, since they have purposeful planning and are tenacious in what they do. (Benet-Martinez, 1998)

An individual high on Conscientiousness may say things like:

- I am always prepared.
- I get chores done right away.

3.3.3 Extraversion

People who are high in Extraversion are generally confident and they have a tendency to seek stimulation in the company of others. They have a lot of energy and spread positive emotions around them. (Benet-Martinez, 1998)

An individual high on Extraversion may say things like:

- I feel comfortable around people.
- I start conversations.

3.3.4 Agreeableness

Individuals who score high on Agreeableness have a tendency to be compassionate and like to cooperate with others. The trait is marked by a wish for social harmony and they value to get along with others. They are willing to compromise, are helpful and generally trusting in other people. (Benet-Martinez, 1998)

An individual high on Agreeableness may say things like:

- I am interested in people.
- I sympathize with others' feelings.

3.3.5 Neuroticism

This type of individual experience unpleasant emotions easily and the emotions tend to be more persistent. They tend to feel anger, anxiety, depression and are more likely to find situations threatening. Individuals who are high in Neuroticism are emotionally reactive and this trait is sometimes called emotional instability. (Benet-Martinez, 1998)

An individual high on Neuroticism may say things like:

- I worry about things.
- I get irritated easily.

4. Result

The results are presented using Pearson correlations (Pearson product-moment correlation coefficient) for the Bartle types and Yee Gaming Motivations in relation to the Big Five Personality Traits. A Pearson correlation range between -1 and 1, where -1 and 1 are perfect correlations. The strength of a correlation is not only determined by the correlation coefficient but also by the relative sample size. In this study, a correlation of less than -.200 was considered a strong negative correlation and a correlation higher than .200 was considered a strong positive correlation.

Even more important than the strength of the correlation is the significance. If a correlation is statistically significant it is unlikely to have occurred by chance; a correlation that is not significant is practically useless. A correlation with a p-value lower than the chosen significance level is determined to be statistically significant. In this study we considered the correlations on a 5% ($p < .05$) and 0.1% ($p < .001$) level of significance, meaning that for a significance of $p < .001$ there is less than a 0.1% chance that the result observed could have occurred by chance. In this study, the symbols “*” and “**” denotes statistically significant results. For more information about correlations and significance, see any book on statistics.

Table 1. Pearson Correlations for Extraversion, Agreeableness, Conscientiousness with Bartle’s Player Types (n= 441).

Bartle Types	Extraversion	Agreeableness	Conscientiousness
Achiever	-.068	-.133**	.054
Explorer	-.161**	.192**	.021
Socializer	.190**	.351**	-.090
Killer	.063	-.339**	.004

Notes: * = $p < .05$; ** = $p < .001$

There was a negative and significant correlation between the Extraversion trait and the Bartle Explorer, and a positive significant correlation between Extraversion and the Bartle Socializer. Agreeableness correlated positively and significantly with the Bartle Explorer and Socializer, while there was a negative significant correlation with Achiever and Killer. Conscientiousness did not correlate significantly with any of the Bartle Types.

Table 2. Pearson Correlations for Openness, Neuroticism with Bartle’s Player Types (n= 441).

Bartle Types	Openness	Neuroticism
Achiever	-.227**	.071
Explorer	.164**	.078
Socializer	.056	-.014
Killer	.005	-.105*

Notes: * = $p < .05$; ** = $p < .001$

Openness correlated negatively and significantly with the Bartle Achiever, and positively and significantly with the Bartle Explorer. Neuroticism correlated negatively and significantly with the Bartle Killer.

Table 3. Pearson Correlations for Extraversion, Agreeableness, Conscientiousness with the Yee Gaming Motivations (n= 489).

Motivations	Extraversion	Agreeableness	Conscientiousness
Achievement	.072	-.277**	-.007
Advancement	.067	-.171**	-.011
Mechanics	.037	-.077	.142**
Competition	.057	-.397**	-.133**
Social	.220**	.299**	-.044
Socializer	.188**	.347**	-.023
Relationship	.115*	.047	-.071
Teamwork	.142**	.220**	.011
Immersion	-.035	.069	-.051
Discovery	-.019	.059	.001
Role playing	-.021	.037	-.067
Customization	.027	.035	-.051
Escapism	-.118**	.087	-.034

Notes: * = $p < .05$; ** = $p < .001$

Main components in bold.

Extraversion correlated positively and significantly with the Social component and all Social subcomponents. Extraversion also correlated negatively and significantly with Escapism. Agreeableness correlated negatively and significantly with the Achievement component and the Advancement and Competition subcomponents. There were positive significant correlations between Agreeableness and the Social component and the Socializer and Teamwork subcomponents. Conscientiousness correlated positively and significantly with the Mechanics subcomponent and negatively and significantly with the Competition subcomponent.

Table 4. Pearson Correlations for Openness, Neuroticism with the Yee Gaming Motivations (n= 489).

Motivations	Openness	Neuroticism
Achievement	-.046	.026
Advancement	-.027	.084
Mechanics	.030	.050
Competition	-.106*	.005
Social	.183**	.078
Socializer	.242**	.013
Relationship	.134**	.156**
Teamwork	-.017	.024
Immersion	.313**	.277**
Discovery	.264**	.215**
Role playing	.294**	.219**
Customization	.168**	.173**
Escapism	.141**	.203**

Notes: * = $p < .05$; ** = $p < .001$

Main components in bold.

There were positive and significant correlations between Openness and the Social component, the Socializer and Relationship subcomponents. Openness also correlated positively and significantly with the Immersion component and all its subcomponents. There was a negative and significant correlation between Openness and the Competition subcomponent. Neuroticism correlated positively and significantly with the Relationship subcomponent, the Immersion component and all its subcomponents.

5. Discussion

This chapter will discuss the correlations between the personality traits and the Bartle Types/Yee Gaming Motivations and discuss the validity of the three tests.

A weakness of our study was that the participants all came from similar forums, with a majority from the World of Warcraft forums. This was a necessity since the participants had to have MUD/MMORPG experience. Unfortunately, this makes our sample group quite homogeneous. The sample is not spread out over all World of Warcraft players, but those who actively browse the game related forums and are interested in answering questionnaires. It is possible that such players have similar preferences or personality traits, perhaps being more Extroverted than the average player. However, there was nothing in our results that indicated that Extroverts, or any other group, were over represented in the sample.

The Bartle Test was chosen because it is the most well known test of gaming preferences. It provided important insights in how people play MUD's/MMORPG's, and lay the groundwork for further studies in the field by creating a model for assessment of different player types. However, the test has its limitations in that it is not validated or grounded in empirical data (Yee, 2005).

Yee took a factor analytic approach to creating a model for assessment of gaming motivations. It was included in this study because it provides a validated model for measuring gaming motivations, and to further examine the proposed differences between Yee's and Bartle's models.

Finally, the BFI was included because the Big Five model of personality traits is the most comprehensive assessment of personality traits available.

5.1 Extraversion

The focus for an individual high on Extraversion is to obtain gratification from what is outside the self, and she enjoys being the center of attention. Our results suggest that an Extrovert individual acts similarly in real life and while playing games; always maintaining a focus on social contacts. The correlations between Bartle's Socializer and the Extraversion trait, Yee's Social component and the Extraversion trait are both significant ($r = .190$, $r = .220$).

Our result further strengthens the theory behind a social motivation for gaming and suggests that the Extraversion personality trait is generalizable to gaming environments. Much like an individual high on Extraversion, the Socializer is talkative and enjoys spending time with other people. Bartle (1996) says about his Socializer that they view the game as just another place where you can find new people to interact with. The definition for Yee's Social component is similar to Bartle's, and as expected the result were similar.

Our results also indicate that an Extrovert individual will seek stimulation in social contacts rather than in the interaction with the in-game world. There was a negative and significant negative correlation between the Extraversion trait and Bartle's Explorer type ($r = -.161$). This does not mean that the Explorers are shy or socially inhibited, rather they prefer having a closer circle of fewer friends. They do not thrive on making new social contacts, as is the case with someone high on Extraversion.

5.2 Agreeableness

The positive correlation between the Agreeableness trait and the Bartle Socializer ($r = .351$) is explained through the interest in people and what they have to say. An Agreeable individual strives for social harmony and cooperation within the group or community. A distinction can be made between the Extroverted Socializer, who is more focused on satisfying her own social needs, while the Agreeable Socializer is content with simply coexisting in harmony with others.

The description of the Agreeableness trait is more in line with Bartle's definition of the Socializer than the Extraversion trait is, and our results support this notion through a stronger correlation between Agreeableness-Socializer ($r = .351$) than Extraversion-Socializer ($r = .190$). Yee's Social component bears similar definition with the Agreeableness trait and as expected, the correlation was strong and significant ($r = .299$).

More surprising was that Yee's Relationship subcomponent did not correlate significantly with Agreeableness, and though there was a positive correlation, it was weak ($r = .047$). One explanation could be that forming a relation with another person requires much more than just a desire to do so, or more than just a trait that supports this behavior. A wish from both players is needed to get along and develop a relation, common interests to discuss, perhaps similar experiences or cultural backgrounds to better understand each other. These are factors that may not always exist, and even an Agreeable person may not find many people to form strong relationships with in games. Another explanation is that forming relationships may not be a true motivation for playing, rather it is a side-effect that occurs through sheer coincidence. For example, you may come across another player while doing a difficult quest. Together you assist each other in completing this quest, and while cooperating and talking about the quest you find out that you actually enjoy talking to this person or have a lot in common. This could be the beginning of a new friendship, formed through random interaction and without thought or intent.

There is also a third and perhaps more plausible explanation. Yee describes the Relationship subcomponent as having a desire to form strong relationships (2007). This makes the player active in her pursuit of forming these relationships. The Agreeableness trait is more of a passive trait, where people high on it are kind and pleasant, not necessarily in pursuit of new friends. The Relationship-seeking behavior is more of an Extrovert action, and indeed the correlation between Relationship and Extraversion is both positive and significant ($r = .115$).

An individual with high Agreeableness tends to let other peoples' wants and needs surpass their own or be open to compromises. It is therefore reasonable to assume that an individual high on Agreeableness will not adopt the Bartle Achiever's goal-oriented game play and the correlation we found supports this ($r = -.133$). Compromises are not an option for the Achiever who has her own agenda and specific goals. Exceptions might be allowed, but only to favor one of the Achievers current goals. The Achiever, while not interested in causing distress, does not care for social harmony like an individual high on Agreeableness does.

In the same spirit, Agreeableness has a strong negative correlation with Yee's Achievement component ($r = -.277$). This is not surprising, since the Achievement subcomponents Competition and Advancement consist of motivations such as power over others, domination and provocation. The Competition subcomponent alone has a stronger negative correlation ($r = -.397$) with Agreeableness than the other subcomponents. In the Competition subcomponent we find motivations like challenging others and provocation, two actions that are not very Agreeable.

It is worth noting that the Mechanics subcomponent did not correlate significantly with Agreeableness, unlike the two other Achievement subcomponents. Being analytical and striving for optimized game play through planning and calculation is unrelated to interaction with people.

The definition of an Agreeable individual is a direct opposite to Bartle's Killer type, and it was therefore expected that a person high on the trait of Agreeableness would not score high on the Killer type. This is supported by a strong and significant negative correlation between Agreeableness and the Bartle Killer ($r = -.339$). This could be due to the strong empathy found in Agreeable individuals, and it may be that sitting behind a computer screen does not inhibit this trait. The focus for a Killer is to impose herself on other players with the aim to cause distress, this is something an Agreeable individual would probably not do. The Agreeable individual is helpful and kind, she tends to sympathize with others' feelings, while the Killer would probably lead you in the wrong direction for her own amusement.

It is unclear why the Agreeableness trait correlates positively and significantly with Bartle's Explorer type ($r = .192$). The Explorer according to Bartle is interested in the in-game world rather than the players inhabiting it, but there are some plausible explanations for the correlation. The lack of interest in people could make the Explorer nice and friendly when you meet her, but she will not find you and initiate a conversation. She simply has no reason not to be nice, so while not being entirely Agreeable, she is not disagreeable either. Also, the strong negative correlation between the Explorer and the Killer ($r = -.623$) suggests that the Explorer type does not have a need to impose herself on other people. Again, while not making the Explorer Agreeable, it does not make her disagreeable either.

5.3 Conscientiousness

Conscientiousness does not correlate significantly with any of the Bartle types. This was surprising, since the Conscientiousness trait and the Achiever type share many characteristics. For example, an individual high on Conscientiousness is hard working, goal oriented and has a need for achievement. This definition is similar to Bartle's Achiever type, who does everything to reach certain goals. But the result shows no direct correlation between the two. It is possible that this personality trait is not generalizable to a gaming environment, perhaps playing games does not satisfy the need for structure and self-discipline that individuals high on Conscientiousness want. Perhaps their aim for achievement is not compatible with only achieving things in a gaming environment.

The same can be said about Yee's motivation components, where Conscientiousness did not correlate significantly with the Achievement component or the Advancement subcomponent. This is probably due to that Yee's questions concerning Advancement focuses on status and rapid gaining of power. For an individual high on Conscientiousness, power and status is not in focus. Rather it is about being organized, deliberate and disciplined. This explains why Conscientiousness correlates positively and significantly with the Mechanics subcomponent ($r = .142$), where these behaviors are dominant.

People who score high on Conscientiousness also act carefully and according to their conscience. This does not go well together with the Competition subcomponent that is characterized by provocation and domination. Indeed this correlation turned out negative and significant ($r = -.133$). Since the subcomponents of Achievement correlated both positively and negatively with Conscientiousness, it is more understandable that the overarching component showed no correlation at all.

5.4 Neuroticism

Individuals who score high on Neuroticism may use MMORPG's as a way to escape from reality, the correlation is positive and significant ($r=.277$) with the Immersion component and all subcomponents. For these individuals life can be troublesome due to their neurotic tendencies, and it is possible that they use games to relax and forget about their stressful real life situation for a while. Empirical research supports this notion; Internet use increases as people are put under more stress in real life (e.g., Ko et al., 2006). Furthermore, if a stressful or emotionally intense situation occurs in a game, you can quit or log off until you feel stable and have the situation under control again. In every day life this is a problem for those high on Neuroticism, situations occur but you can not just log off. This makes the Internet and MMORPG's a safe haven for these individuals where they have control and can relax.

Following this reasoning, it is not surprising that Neuroticism correlates positively and significantly with the Relationship subcomponent ($r=.156$). Meeting new people or making friends is an emotionally intense situation and if you tend to get nervous easily this could inhibit your attempts to get close to other people. Being safe behind a computer screen while interacting with other people may facilitate the forming of new relationships for someone who in real life finds such situations uncomfortable. This makes MMORPG's an ideal place to form new relationships, even more so for an individual high on Neuroticism.

The Neuroticism personality trait also correlates negatively and significantly with the Killer type ($r=-.105$). Empirical evidence behind Neuroticism suggests that individuals high on this trait often experience anger, anxiety, guilt and stress (Benet-Martinez, 1998). These feelings would be unpractical as a Killer, considering that most of their playtime is spent imposing themselves on other players. The Killer type enjoys causing distress, and if they felt anxious or guilty every time they did it, they would not have a very good time playing.

5.5 Openness

For someone who scores high on Openness, an MMORPG offers the perfect environment to try new things and experiment with ideas. With this in mind it is not surprising that the Openness trait correlates positively and significantly with the Immersion component ($r=.313$) and all subcomponents. If you are into creating a new history for your character, exploring a new world or following an exciting storyline, MMORPG's are the perfect place for you.

Bartle defines the Explorer as interested in interacting with the in-game world and its internal machinations. As was the case with Agreeableness, the correlation with the Openness trait is positive, significant ($r=.164$), and unclear. The Openness trait does not include the rational knowledge acquisition process of the Bartle Explorer, rather an individual high on Openness is curious for no apparent reason and without a goal in mind. Individuals high on Openness are interested in aesthetic, emotional and novel experiences. While this is partly covered by the Bartle Explorer, its focus remains on only a small part of the Openness trait. Our results indicate that the Explorer is more open and creative than Bartle might have thought, and this is also supported by prior studies (Yee, 2005). In addition to their interest for trivia and finding bugs in the code, the Explorer seems to be open towards new people and new experiences as well. This is a plausible explanation for the somewhat surprising correlations we found concerning the Bartle Explorer, and supports Yee's claim that the Bartle Explorer type is flawed.

Openness also correlated positively and significantly with Yee's Social component ($r=.183$), even though Openness generally concerns personal values and interests rather than an interest in other people. One explanation for this could be that being open to new things also makes you open to meeting new people. Also, the more new things you try the higher is the chance of meeting new people.

Notable is that Openness did not correlate significantly with the Teamwork subcomponent, rather there was a weak negative correlation between the two ($r=-.017$). It may be that as an individual high on Openness it could be troublesome to be dependent on other people. If you are part of a group, every decision will usually be made in accordance with the wishes of a majority. This could effectively keep someone who wants to try something new from doing so, since she has to go with the group decision. A person high on Openness may therefore prefer to not be dependent on teamwork, as it could be a hindrance to their discovery of new things.

The Openness trait is usually characterized by intellectual curiosity, vivid imagination and preference for a variety of experiences (John, 2008). In line with this, the correlation to Bartle's Achiever type is negative and significant ($r=-.227$). Since the Achiever is mostly concerned with reaching goals in an efficient manner, they do not enjoy a variety of experience. Rather, an Achiever could feel stressed or uncomfortable with new or unexpected things in the game because it may interrupt their progress. The intellectual curiosity only appears if there is an immediate benefit to the Achiever's current goal, they are not curious by nature.

Additionally, Openness correlates negatively and significantly with the Competition subcomponent ($r=-.106$), but not with its overarching Achievement component or the other subcomponents. The Competition subcomponent is characterized by a will for domination, challenging other people or provoking them. Our results indicate that individuals high on Openness would not act like this while playing. This could be due to their high receptiveness to emotional states. The definition of the Openness trait appears to mostly concern the individuals inner feelings, but it may include a receptiveness to others emotions as well.

6. Conclusion

The result of this study indicates that personality traits do affect why and how we play. The study offers an explanation to why different players exhibit different motivations when playing. Since every individual has more or less of each personality trait, and personality traits affect how we play, every player will be as unique in her play style as we are unique in our personality. However, it is important to keep in mind that knowing what traits are stronger in an individual does not necessarily reveal the whole spectrum of her play style. Just like our personality traits do not reveal explicitly who we are or how we act in real life, neither will they reveal explicitly how we play. Our actions are still for us to choose, they are not predetermined.

Knowing that personality traits affect how we play brings us to the conclusion that we transfer part of our real life characteristics when we enter an MMORPG. This notion is supported by prior studies suggesting that for example gender roles transfer to virtual worlds. Yee (2005) found that women tend to take on supportive roles (e.g. healing) far more often than men, and he also found the mirroring effect. While Yee's discoveries suggests that physical attributes and behaviors transfer to the gaming world, our results indicate that psychological aspects, in this case personality traits, are also transferred. The knowledge that we transfer parts of our personality into the game brings us to the question of how much of our experiences in the gaming world we bring back with us to the real world, and what consequences it could have. For some people it may bring positive experiences by allowing them to be part of a group of people and cooperate towards a common goal. This could have a positive effect on your real life confidence and encourage a person to try doing similar things in real life. There are studies suggesting that making more online friends could have a positive effect on your offline social life as well (e.g. Axelsson & Reagan, 2002), but empirical research has so far shown mixed results. It could also have the opposite effect if they have a humiliating experience. If you make a fool out of yourself in a game, people are not more accepting or forgiving than in real life.

Taunting, bullying and ostracizing are not only a real life phenomenon, it happens just as much or even more on the Internet, and games are no exception. It is important to keep in mind that your actions towards others in a game will affect them in real life to some extent. The extent of the effect may vary depending on personal factors such as self-confidence, but also depending on what game you play. The more you care about your character and the more effort you have put in when playing, the more personal you may take it when something happens to it, be it a positive or negative experience. Games such as Quake or Counterstrike that completely lack a character creation phase and where dying is very common, gives the player a weaker connection to their character, and causes the player less distress and feeling of loss when dying. Games like MMORPG's/MUD's where the player typically spends a lot of time and effort in creating their character, gaining levels or equipment cause greater distress and feeling of loss when dying. This is an area that future research should explore further, to examine what factors can affect the extent of the psychological experiences you bring out from the gaming world.

The results of this study could have implications for further studies of Internet addiction. If more attention was paid to what stimulation the addicted individual enjoys from the game she is dependent on, it could facilitate treatment. If the addict does a BFI test and scores high on Neuroticism and Extraversion, while not having many real life friends, perhaps he is playing computer games primarily to satisfy his need for social contact in a safer environment. To take the computer away as part of his treatment could be directly harmful as it would remove most of the addicts' social life. Instead, behavioral therapy could be helpful

to help the addict get rid of his social anxiety and actively seek out new people to socialize with in real life.

Another area where our study could prove useful is for educational purposes. Depending on the students different personality traits the teacher could tailor a method to better accommodate the students' needs. Consider the introductory quote. The female player complains that her real life tasks are repetitive and dull, and that she does not gain a substantial reward from doing her laundry. This is much like studying ancient history in school, where you are forced to learn about kings and historic events without seeing a point in learning it. If you could tailor a method to specifically appeal to a student high on Openness, for example by setting up a play depicting a historical event, they could be more motivated to learn. At the same time, an Achiever might not need a specific method to be motivated to study ancient kings, because the knowledge that they can get that A grade is enough to keep them going.

Consider that this study has shown that we bring part of our personality traits into the game, and that these are transformed into specific player types or gaming motivations when playing. These types/motivations are then a mixture of our personality traits reflected through the way we play. In essence they make up a new set of "gaming personality traits" that are displayed through the play style. These gaming personality traits, as this study shows, originate from our real life persona, and the perhaps most common excuse for offensive behavior, "who cares, it's only a game", suddenly falls short. So, next time you are about to kill a defenseless low-level newbie, stop for a moment and consider what this act tells us about you.

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Appendix A - Big Five Inventory

ITEM NUMBERS BY PERSONALITY TRAIT

Agreeableness

- Question 2-I tend to find faults with others. (-)
- Question 7-I see myself as helpful and unselfish with others.
- Question 12-I see myself as someone who starts quarrels with others.(-)
- Question 17-I have a forgiving nature.
- Question 22-I am generally trusting towards other people.
- Question 27-I can be cold and distant. (-)
- Question 32-I am considerate and kind to almost everyone.
- Question 37-I am sometimes rude to others. (-)
- Question 42-I like to cooperate with others.

Conscientiousness

- Question 3-I am someone who does a thorough job.
- Question 8-I can be somewhat careless. (-)
- Question 13-I am a reliable worker.
- Question 18-I tend to be disorganized. (-)
- Question 23-I tend to be lazy. (-)
- Question 28-I persevere until the task is finished.
- Question 33-I see myself as someone who does things efficiently.
- Question 38-When I make plans I follow through with them.
- Question 43-I am easily distracted. (-)

Extraversion

- Question 1-I see myself as someone who is talkative.
- Question 6-I am reserved. (-)
- Question 11-I am full of energy.
- Question 16-I see myself as someone who generates a lot of enthusiasm.
- Question 21-I tend to be quiet. (-)
- Question 26-I have an assertive and decisive personality.
- Question 31-I am sometimes shy or inhibited. (-)
- Question 36-I am outgoing and sociable.

Neuroticism

Question 4-I am often depressed.

Question 9-I am relaxed and handles stress well. (-)

Question 14-I can be tense.

Question 19-I worry a lot.

Question 24-I am emotionally stable, not easily upset. (-)

Question 29-I can be moody sometimes.

Question 34-I remain calm in tense situations. (-)

Question 39-I tend to get nervous easily.

Openness

Question 5-I am original, comes up with new ideas.

Question 10-I am curious about many different things.

Question 15-I am ingenious, a deep thinker.

Question 20-I have an active imagination.

Question 25-I am inventive.

Question 30-I value artistic, aesthetic experiences.

Question 35-I prefer work that is routine. (-)

Question 40-I like to reflect upon and play with ideas.

Question 41-I don't have many artistic interests. (-)

Question 44-I am sophisticated in art, music or literature.

Appendix B - Yee Assessment of Gaming Motivations

ITEM NUMBERS BY COMPONENTS

Achievement

Question 45-I want to acquire rare items that most players will never have.

Question 46-I aim at becoming powerful in the game.

Question 47-I enjoy accumulating resources, items or money.

Question 48-It is important to to be well-known in the game.

Question 49-It is important for me to be part of a serious, raid/loot-oriented guild.

Question 50-It is important that my character is as optimized as possible for their profession/role.

Question 51-I often use a character builder or a template to plan out my character's advancement at an early level.

Question 52-It is important to know as much about the game mechanics and rules as possible.

Question 53-I purposefully try to provoke or irritate other players.

Question 54-I enjoy dominating/killing other players.

Question 55-I enjoy doing things that annoy another person.

Social

Question 56-I enjoy helping other players.

Question 57-I enjoy chatting with other players.

Question 58-I want to be part of a friendly, casual guild.

Question 59-I talk to my online friends about my personal issues.

Question 60-My online friends offer me support when I have a real life problem.

Question 61-It is important to me that my character can solo well.

Question 62-I enjoy working with others in a group.

Question 63-I enjoy having a self-sufficient character.

Immersion

Question 64-I enjoy finding quests, NPCs or locations that most people do not know about.

Question 65-I enjoy collecting distinctive objects or clothing that have no functional value in the game.

Question 66-I like to explore every map or zone in the world.

Question 67-I enjoy being immersed in a fantasy world.

Question 68-I often make up stories and histories for my characters.

Question 69-I often role-play my character.

Question 70-It is important that my character's armor / outfit matches in color and style.

Question 71-It is important that my character looks different from other characters.

Question 72-I often play to relax from the day's work.

Question 73-I enjoy gaming because it allows me to temporarily escape from the real world.

Appendix C - Correlations