

# The Relationship between the Five Factor Personality Model and Motivations for Play in MMORPGs

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## Abstract

Computer and video games are reaching a wider audience than ever before, yet distributors are struggling to keep up with past growth. *Demographic game design* posits that in order to create more commercially successful games, designers must understand the player in order to anticipate their needs. The industry struggling as it is, this understanding has become even more important. The aim of this study was to understand the relationship between player personality and motivations for game play in order to add to a base of publicly and academically available information on which designers can draw. The Neuroticism Extraversion Openness-Five Factor Inventory (Costa & McCrae, 1992) and Nick Yee's Motivations for Play in MMORPGs Assessment (2005) were administered to 51 Dakota State University students. Results demonstrated that even in a small group of "core gamers" there is a great deal of variety in play motivations. Furthermore, there were several significant correlations between personality factors and play motivations. Achievement motivations were positively correlated with Extraversion ( $p < .01$ ) and Conscientiousness ( $p < .05$ ). Social motivations were positively correlated with Extraversion ( $p < .001$ ) and Agreeableness ( $p < .01$ ). Immersion motivations were positively correlated with Neuroticism and Openness to Experience ( $p < .05$ ). Other relationships and further opportunities for study and expansion of the motivations model are discussed.

**Keywords:** Demographic Game Design, Five Factor Model, Gersonality, MMORPG, Motivation, Video Game

## 1. Introduction

Computer and video games are experienced by a wider audience than ever before. The average age of a player is 31 years, and half of players and purchasers of games are female. Gaming has become a multi-generational activity enjoyed by men, women, and children of all ages, often together<sup>1</sup>.

Almost half of players say games give them the most value for their money compared with DVDs, music, or going to the movies, and many players spend more time gaming than watching TV or movies. In 2013, U.S. spending in the games industry reached \$21.53 billion. Yet, in recent

years digital game sales have struggled keeping up with past growth<sup>1</sup>. As the gaming market and library expands, the idea of the "stereotypical gamer" or even a "typical gamer" is becoming obsolete, and audiences seem to be getting more conservative with their spending if not more discerning about their games. Thus, it is more important than ever to understand not just *who* is playing *what*, but *how* and *why* they want to play.

*Demographic game design* posits that in order to create more commercially successful games, designers must understand their players and learn to anticipate their needs<sup>2</sup>. However, while academic research in this area is growing, it is still lacking, and most industry research

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is kept proprietary and unavailable to the public or for study. Thus, players remain largely theoretical figures to the designer<sup>3</sup>.

Earlier models and research have categorized players into as few as two and as many as nine groups based on descriptors like consumption style, players' interactions with the rules, each other, and the game world, when and where they play, and with whom who they play<sup>2-4</sup>. Bateman's research analyses player types in relation to Myers-Briggs personality types<sup>2</sup>. One advantage to this is that while there is little research in player descriptions and categories, there is much research in human personality, including population proportions, which could help designers and marketers understand exactly who (and how many) they may be targeting. Other research has attempted with varying success to link personality factors with genre favor and choice<sup>5,6</sup>. However, a problem with these categorical approaches is that they still lock a theoretical player into a neat box, where in actuality; many players may be left straddling the rim between them. Some approaches have even categorized players by the way they play, when a player may play different games different ways, or a single game—especially one as complex as an MMORPG (massively multiplayer online role-play game)—several ways depending on her mood.

Genre is inherently misleading because not only is there no agreed taxonomy, but the approach is reactive. Designers cannot be expected to create innovative and appealing games using only tools from a pre-existing genre. Many new resources have wisely begun “tagging” games rather than sorting them<sup>7</sup> as the market introduces and technology enables more complex varieties of game with hybrid genres such as “action RPG” and “rogue-like plat former” (i.e. Risk of Rain<sup>8</sup>). These “genres” have become descriptions based on games that once shared clusters of features; adjectives rather than categories. This may be useful for players and even industry members to discuss games after production, but designers will not expand the art or market of games by imagining their product in terms of narrow and ill-defined categories. Neither will those who study games find a reliable or exhaustive vocabulary or model for understanding games and those who play them in this constantly growing and changing terminology.

In the light of this, this study attempts to describe players and their reasons for playing with empirical models rather than categorize them or find reliability in popular constructs. This research is designed to establish a direct link between a meaningful aspect of a potential player—*personality*—and one or more of their gaming needs in the guise of *motivation*. Hopefully this will lead to more sound game design and marketing which asks not “what type of player will play this game?” but “what does this game have to offer potential players?”

## 2. Background Research

### 2.1 MMORPGs and Nick Yee's Motivations for Play

Eleven percent of online gaming taking place in “persistent multi-player universes”<sup>1</sup> such as MMORPGs. MMORPGs (Massively Multiplayer Online Role Play Games) are large, complex, game environments with a variety of activities (quests) and systems (level, crafting, etc.) designed to keep players busy for years. Common examples of these are World of War craft<sup>9</sup>, Maple Story<sup>10</sup> and Ever Quest<sup>11</sup>. They continue to grow in player-base and content for years after their initial release. These endeavors are long-term and expensive and many MMORPGs must attract and keep players by offering a nearly endless and constantly expanding variety of ways to play, often by combining elements usually found in more limited combinations in other games. Thus, in a single MMORPG, a player can experience and express a variety of play styles normally found in multiple games of a less “massive” scale.

Considering the nature of these games, it should come as no surprise that “MMORPG” is one of the aforementioned hybridized categories of games, combining massively multiplayer online (MMO) games and Role Play Games (RPG). It also has parent categories (ie. MUD, graphical MUD), tangent categories (i.e. MMO strategy games, MOBAs), sub-categories (i.e. sci-fi MMORPG, action MMORPG), and spin-off categories of its own, further highlighting the complexity of describing— to say nothing of categorizing— games and their players.

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

**Figure 1.** Components and subcomponents of motivations for play in MMORPGs<sup>12</sup>.

Building from the question “why do you play?” Nick Yee began an attempt to organically derive MMORPG players’ strongest reasons for playing. From these interviews, 41 items were derived, and through factor analysis, 39 items loaded on 10 subcomponents under 3 major components revealed as most MMORPG players’ predominant reasons for playing<sup>12</sup>. Yee’s organization of these components and subcomponents are shown in Figure 1.

It is important to note that these motivations are scalar, not categorical. When participants take the assessment online at Yee’s website, they receive a set of scores for each component and subcomponent in percentiles related to those who have taken the assessment before. In this study, we have used raw scores calculated by adding the scores provided by our participants for each item together by both component and subcomponent. A full list of the items and their associated components and subcomponents is available in his article on the study<sup>12</sup> as well as on his website. This output gives a multi-factored numerical description of a player’s motivations rather than a category.

Yee points out that categories of players using axis—like the Bartle Types—are really only useful if each axis has a bi-modal distribution. The closer to the origin a player falls on either axis, the less the category system describes them. Yee demonstrates that there are no bi-modal distributions on this axis. Furthermore, these motivations “do not suppress each other.” These motivations are not negatively correlated with one another; being high in one motivation does not preclude being high in another. Finally, for the purpose of exploring his research, Yee used a simple formula (primary \* .75 > secondary) to determine if a player had a “primary” motivation. However, this only

provided a primary motivation in 53% of cases, further emphasizing that any individual can be playing for a multitude of comparably compelling reasons.

As this model is partially based on a healthy criticism of categorical player models, it is only fair to note that this assessment also has its limitations. For instance, although “Story Line” is listed as one of the primary elements of the Role-Playing subcomponent, no inventory items actually mention the narrative of the game. This is not much of a problem in Yee’s research since narrative is not usually a primary element of interest in MMORPGs, but it does serve to highlight the fact that this model is intended for MMORPGs.

However, as mentioned before, MMORPGs are massive and complex virtual game worlds incorporating elements of various other kinds of games. An Achievement element is present in almost every game, and when there is not, those interested are often able to set their own goals to achieve. A plethora of virtual paper doll games is dedicated to customization; “cooperative” games are designed to require teamwork, and so on. The components and subcomponents above easily coincide with at least six of the eight classic MDA Framework aesthetics<sup>13</sup> designed to describe the appeal of a wide variety of games. The items are accessible enough for players of other games and even non-players to answer hypothetically or in reference to the games they do play. Therefore, while not exhaustive, this model is considered to be adequate for what is currently understood to be a pioneering study.

## 2.2 Five Factor Personality Model

The Five Factor Personality Model is a theory based on lexicographical and empirical analysis to describe individuals in terms of five major personality domains, also called *factors*<sup>14</sup>. These five domains are understood to have six major components each. The most common terms for the five domains, or “factors” are Neuroticism (or Emotional Stability in the reverse), Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. Each factor and component is measured and reported on its own scale. Compared with the categorical organization of the Myers-Briggs model, this factor-driven approach is better suited to this research.

The following are brief descriptions of each of the five factors<sup>14-16</sup>.

### 2.2.1 Neuroticism

*Neuroticism* is the tendency toward anxiety or psychological distress. Those high in Neuroticism may be Apprehensive, bitter, pessimistic, timid, easily tempted, and/or fragile. Those with high Neuroticism are prone to stress and low self-esteem. Those low in Neuroticism may be relaxed, even-tempered, optimistic, shameless, restrained, and/or fearless.

### 2.2.2 Extraversion

*Extraversion* is the quantity and intensity of energy directed outwards into the social world. Those high in Extraversion may be affectionate, outgoing, forceful, energetic, reckless, and/or high-spirited. High Extraversion is also associated with excitement-seeking behavior. Those low in Extraversion may be indifferent, withdrawn, quiet, passive, dull, and/or placid. Low Extraversion in the Five Factor Model is not necessarily comparable to Introversion in the Myers-Briggs model<sup>14</sup>.

### 2.2.3 Openness to Experience

*Openness to Experience* (Openness) is the active seeking and appreciation of experiences for their own sake. Those high in Openness may be imaginative, aesthetically oriented and aware of their feelings, eccentric, creative, and/or permissive with rules and values. High Openness is also associated with curiosity and appreciation of patterns and abstractions. Those low in Openness may be practical, uninvolved, unaware of their own feelings, habitual, rigid, and/or traditional.

### 2.2.4 Agreeableness

*Agreeableness* is the style of interactions and view of relationships with/to others an individual prefers. Those high in Agreeableness may be naive, honest, giving, cooperative, meek, and/or empathetic. High Agreeableness is also associated with altruism. Those low in Agreeableness may be skeptical, cunning, selfish, aggressive, confident, and/or tough.

### 2.2.5 Conscientiousness

*Conscientiousness* is the degree of organization, persistence, control, and motivation in goal directed behavior. Those high in Conscientiousness may be perfectionistic, methodical, rigid, ambitious, dogged and

cautious. Those low in Conscientiousness may be lax, disorganized, casual, aimless, negligent, and/or rash.

The leading assessment for this model is the NEO-PI (Neuroticism Extraversion Openness-Personality Inventory) and its relatives<sup>14,15</sup>. Among these is the NEO-FFI (Neuroticism Extraversion Openness-Five Factor Inventory)<sup>17</sup> which has been used in this study for its relative brevity. Sixty statements are rated by the participant from “strongly disagree” to “strongly agree” on a 5-point scale. The items are then scored (some reverse scored) and added under the appropriate factors. There are equal numbers of questions and thus equal maximum scores for each factor. The determination of “high” and “low” scores in a particular factor is often made with relation to others in similar demographic groups as the individual (usually male and female)<sup>18</sup>. However, this study is interested in correlations and has not made determinations of “high” and “low” scores.

The model itself has been developed separately but conveniently in various cultures and languages. Since its inception, the NEO-PI and its relatives have been translated into many languages and validated across cultures, countries, ages, and time. It is our hope to continue this research and gather data from individuals in countries other than the United States of America.

## 3. Method

### 3.1 Materials

The Motivations assessment and the NEO-FFI were formatted and administered via internet using Google Forms<sup>19</sup>. The web address was distributed to undergraduate students at Dakota State University. Students of game design courses were offered extra credit for completion by their instructor.

Responses were collected by Forms in a spreadsheet and researchers gave the appropriate numerical scores to the responses provided in the sheet. Spearman's correlation was used to find correlations between pairs consisting of one personality factor and one motivation component or subcomponent. Statistical analysis was done in R-Data.

### 3.2 Sample

Fifty-one students responded to the instrument. Most of these respondents were Caucasian (44), male (45), and between the ages of 18 and 20 years old (Table 1).

The majority of respondents were well versed in games, mostly video games. Most said they play “almost every day” (37) and for several hours at a time. Almost all respondents said they have been playing games for “more than 5 years” (Table 2). The demographic homogeneity should be attributed more to the region<sup>20</sup>, the school<sup>21</sup>, and the department (the Game Design Program is in the Mathematics Department) than to the demographic makeup of gamers in general<sup>1</sup>. While this issue should be addressed in further research, these personality profiles are comparable to U.S. norms (Table 3)<sup>22</sup> and results will demonstrate a variety of play styles and motivations.

**Table 1.** Demographics of Study Sample

Respondents	Age (years)	Race (free response)
	min = 18	**Caucasian: 44
	max = 31	Mixed: 2
n = 51	mean = 20.56	Hispanic: 1
male = 45	sd = 2.99	Mexican: 1
female = 6	mode = 19	African American: 1
	*1 non-response	Asian/Pacific Islander: 1
		*non-response: 1

\*left blank \*\*“Caucasian” category tabulates all responses containing some variation of the words “white” or “Caucasian”

**Table 2.** Play Habits of Study Sample.

How long have you been playing games?	How often do you play? (times per week)	How long do you play at a time?
> 5 years: 48	6-7 times: 37	> 5 hours: 4
3-5 years: 2	3-5 times: 8	3-5 hours: 25
< 6 months: 1	1-2 times: 5	1-2 hours: 17
	don't play: 1	30-60 min: 4
		< 30 min: 1

**Table 3.** Means and Standard Deviations of Personality Factors for Study Sample

Personality Factor	Mean	Standard Deviation
Neuroticism Extra-version	24.13 26.04	5.61
Openness	30.08 28.67	7.59
Agreeableness	30.29	6.11
Conscientiousness		5.13
		6.98

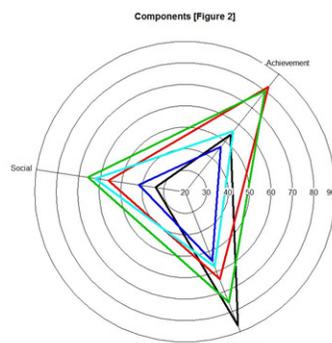
## 4. Results

### 4.1 Data

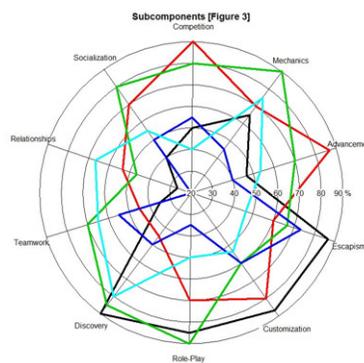
Despite the outward homogeneity of the sample, these results show that the play motivations of the respondents

were quite diverse. Figures 2 and 3 are graphical depictions of 5 respondents’ motivations normalized such that each score represents a percentage of the maximum value available in that component or subcomponent. These respondents were arbitrarily chosen by indexes 5, 10, 15, 20, and 25. It can be seen that even between individuals with similarly scored components, there is diversity in subcomponents.

A number of significant correlations between the five personality factors and various motivations for play were discovered. These are reported in brief below. Table 4 contains the effect sizes and p-values of the relationships between all personality factors and motivation components/subcomponents.



**Figure 2.** Five examples of respondents’ motivations in terms of components (normalized).



**Figure 3.** Five examples of respondents’ motivations in terms of components (normalized).

#### 4.1.1 Achievement

Achievement correlated positively with Extraversion ( $r_s=0.42$ ,  $p<.01$ ), with significant correlations in all subcomponents. Achievement also correlated positively with Conscientiousness ( $r_s=0.31$ ,  $p<.05$ ), with significant correlations in Advancement and Mechanics ( $p<.05$ ).

**Table 4.** Effect Sizes (rs) and p-values of Correlations between Personality Factors and Play Motivations.

Component Subcomponent	Personality Factor									
	Neuroticism		Extraversion		Openness		Agreeableness		Conscientiousness	
	rs	p-value	rs	p-value	rs	p-value	rs	p-value	rs	p-value
Achievement	-0.14	0.320	0.42	0.002†	0.08	0.590	0.10	0.500	0.31	0.030*
Advancement	-0.06	0.700	0.24	0.090	-0.05	0.710	0.10	0.480	0.28	0.049*
Mechanics	-0.09	0.550	0.37	0.007†	0.19	0.190	0.09	0.540	0.32	0.020*
Competition	-0.22	0.120	0.24	0.09	0.07	0.650	-0.05	0.750	0.15	0.310
<b>Social</b>	<b>-0.05</b>	<b>0.730</b>	<b>0.66</b>	<b>0.000‡</b>	<b>0.23</b>	<b>0.102</b>	<b>0.36</b>	<b>0.009†</b>	<b>0.17</b>	<b>0.230</b>
Socialization	-0.02	0.910	0.60	0.000‡	0.24	0.084	0.35	0.013*	0.40	0.000
Relationship	-0.05	0.740	0.47	0.0005‡	0.28	0.047*	0.36	0.009†	0.10	0.470
Teamwork	-0.23	0.104	0.55	0.000‡	-0.14	0.329	0.39	0.005†	-0.16	0.270
<b>Immersion</b>	<b>0.28</b>	<b>0.049*</b>	<b>0.00</b>	<b>0.990</b>	<b>0.33</b>	<b>0.016*</b>	<b>-0.18</b>	<b>0.200</b>	<b>-0.02</b>	<b>0.880</b>
Discovery	0.32	0.020*	0.17	0.220	0.35	0.012*	0.00	1.000	0.05	0.740
Role-Play	0.19	0.170	-0.05	0.730	0.38	0.006†	-0.26	0.070	-0.16	0.270
Customization	-0.17	0.230	0.05	0.730	0.10	0.490	0.03	0.820	0.10	0.480
Escapism	0.35	0.012*	-0.12	0.400	0.28	0.045*	-0.20	0.200	-0.05	0.710

Significance levels: p<.1 \*p<.05 †p<.01 ‡p<.001

#### 4.1.2 Social

Extraversion showed a strong positive correlation with Social motivations ( $r_s=0.66$ ,  $p<.001$ ) and with all subcomponents of Social motivations ( $p<.001$ ). Agreeableness also had a strong positive correlation with Social motivations ( $r_s=0.36$ ,  $p<.01$ ) and again with all subcomponents ( $p<.05$ ). There was a positive correlation between Openness and the Socialization ( $r_s=0.24$ ,  $p<.1$ ) and Relationship ( $r_s=0.26$ ,  $p<.05$ ) subcomponents. The Socialization subcomponent correlated positively with Conscientiousness ( $r_s=0.40$ ,  $p<.01$ ).

#### 4.1.3 Immersion

Immersion was positively correlated with Openness,  $r_s=0.33$  ( $p<.05$ ), with significant correlations in all subcomponents ( $p<.05$ ) except Customization (see 4.1.3.1). Neuroticism was positively correlated with Escapism ( $r_s=0.35$ ,  $p<.05$ ) and Discovery ( $r_s=0.32$ ,  $p<.05$ ). Role-Playing correlated negatively with Agreeableness,  $r_s=-0.26$  ( $p<.1$ ).

##### 4.1.3.1 Customization

The Immersion subcomponent, Customization, held very little or even inverse relationships with the personality factors compared with the other Immersion subcomponents. This is not seen in any of the other

components or subcomponents. When this subcomponent is removed, such that Immersion = Discovery + Role - Playing + Escapism (instead of Discovery + Role - Playing + Customization + Escapism), the correlation between Immersion and Openness increases to  $r_s = 0.39$  at  $p<.01$  and the positive correlation between Immersion and Neuroticism increases to  $r_s=0.35$  ( $p<.05$ ).

## 4.2 Discussion

### 4.2.1 Stereotypes

Extraversion was most reliably correlated with motivations to play and was the only factor to be correlated with not one, but two major components. So while many “gamers” are stereotypically viewed as anti-social basement-dwellers<sup>4</sup>, networked games like MMOs also attract the opposite.

### 4.2.2 Escapism

Neuroticism could arguably be related positively to Immersion, primarily through Escapism. Individuals with high Neuroticism are likely to feel stressed and have low self esteem. These individuals may recognize most potently the need to relax and/or escape and for some reason, certain individuals have found that games are a good way. This may lead to game-related behavior that appears addictive. Thus these findings may be of use to

researchers interested in maladjusted behaviors related to playing games such as “game addiction.” An important question to explore may be what is it about games that can satisfy this need? Can certain types of games relieve stress or be therapeutic for individuals with characteristics of high-Neuroticism?

Similarly, individuals with high Openness may not actually play for Escapism more often. They may simply be recognizing the feeling that they need to relax or escape and that playing games meets that need, as is consistent with individuals high in Openness being more aware of one’s own feelings.

### 4.2.3 Unexpected Findings

In the course of analyzing this data, several interesting and unforeseen relationships were revealed. In these unforeseen results lie several more opportunities for explorations and further research. Some of these are discussed here.

#### 4.2.3.1 Customization and Immersion

As mentioned before, Customization did not correlate with any of the personality factors. This was even the case on an item level. Immersion itself is also a strange category in this context. Usually immersion is used to refer to a state of being while playing a game rather than a motivation or set of features. Yee also mentioned it might be common to have high motivations in two of the Immersion subcomponents and not in the others. While the items have high factor loadings on their subcomponents, the subcomponents’ factor loadings on Immersion are relatively low compared with the others on Social and Achievement.

While it is clear that these subcomponents relate to something other than Social or Achievement, it may not be “Immersion” and they may need to be organized differently or even added to. For example, the assessment makes no mention of features like narrative, music, graphics, or character personality or development other than that which is imbued on PCs (player characters) by their players. These features may not have been potent or important enough in an MMORPG setting to mention as a reason for playing, but they are certainly important to other games. Exploring this is a possible way to expand the model to be more useful to games other than MMORPGs.

#### 4.2.3.2 Achievement

Although the organization, drive to succeed, managerial disposition accompanying Conscientiousness could have predicted an association with Achievement, the correlation with Extraversion was unexpected. This could be explained by the excitement and energy meant to be generated by marked and rapid achievement and a sense of being powerful. High levels and an abundance of resources also make more of the world and activities available to PCs. This ‘opening of the map’ allows players to seek more exciting challenges as well as do more things with their friends or meet more people.

#### 4.2.3.3 Mechanics

On an item level, Openness shows an inclination toward a positive correlation with Mechanics. This makes theoretical sense as Openness is associated with aesthetic and intellectual appreciation for patterns and abstractions. One of the items in question could also be interpreted as a role-playing item (Yee admits many of the “motivations suggested by the survey are [appear to be] implicit in the questions”) and has the lowest factor loading on Mechanics possibly in part because of this dual interpretation. However, a full set of factor loadings was not provided in Yee’s report, so it cannot be seen how the item relates to the Role-Playing subcomponent. There was one Mechanics item which did not correlate with any of the personality factors. Removing this item (such that  $M = M1+M2+M4$ ), the correlation between Mechanics and Openness increases to  $r_s=.28$  at  $p<.05$ .

#### 4.2.3.4 Agreeableness and Role-playing

At first the negative correlation between Agreeableness and Role-Playing seemed unexpected. However, since it was found that players with high Agreeableness often play with Social motivations, it is reasonable to speculate that they are more interested in projecting their “real life” persona into the game than a make-believe one. As to why this does not carry to Extraversion, to an individual with high Agreeableness the act of role-playing itself in a social environment may seem in genuine, especially when the others in that environment are not role-playing. Since those high in Agreeableness are concerned with honesty and trustworthiness, affecting such personas would seem counterproductive to their main motivations for playing,

while high Extraversion alone does not indicate such concerns. These two factors combined might explain why high Agreeableness would indicate an anti-interest in role-playing.

## 5. Conclusion

The purpose of this research was to introduce a new way of exploring and anticipating players' needs by establishing a useful link between personality factors and motivations for play.

Many previous models have provided useful insight into different styles and habits of play, but the categorical approaches of these models are too constraining for human behavior. Studies have also been conducted involving genres of game, but genres are not only categorical, but as ever changing popular constructs, they may be worth studying themselves, but are too unreliable to be used as a basis for a model.

In this study, two scalar empirical models, the Five Factor Model of personality and Nick Yee's Motivations for Play, were explored in relation to one another. In this exploration, many significant correlations were revealed supporting a connection between personality and player needs. Most of these correlations made intuitive theoretical sense. Others required more conjecture and opened new avenues of exploration such as investigating connections between Extraversion and Achievement, Neuroticism and Escapism, and the inverse relationship between Agreeableness and Role-Playing.

Suggestions were also made for improving and expanding the Motivations model so that it may extend more suitably to a larger variety of games. Of particular interest is reorganizing and/or expanding what is currently the Immersion component.

Admittedly this sample is small, yet already large trends have revealed themselves. A larger sample size may yet reveal more subtle relationships. Admittedly, this sample clearly represents a group even more specific than "core" gamer. An overwhelming majority of respondents have been playing digital games for quite a while. They play regularly, they like games, and they are critical and interested enough in them to study them formally at the college level. Arrangements are currently being made to expand the study to different target groups—including those who do not yet play—and different countries. Nevertheless, this study has shown that even in a sample

so small and outwardly homogeneous, many different play styles and player needs are present and practiced. This only serves to demonstrate the variety of player dimensions and descriptions left to explore.

## 6. Acknowledgement

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## 7. References

1. Entertainment Software Association. Essential Facts about the Computer and Video Game Industry. 2014. Available from: [http://www.theesa.com/wp-content/uploads/2014/10/ESA\\_EF\\_2014.pdf](http://www.theesa.com/wp-content/uploads/2014/10/ESA_EF_2014.pdf)
2. Bateman C, Boon R. 21st Century Game Design. Hingham, MA: Charles River Media; 2005.
3. Sotamaa O. Perceptions of Player in Game Design Literature. Proceedings of Digra 2007 Conference; 2007.
4. Kallio K, et al. At Least Nine Ways to Play: Approaching Gamer Mentalities. Games and Culture; 2010.
5. deGraft-Johnson C, et al. Relating Five Factor Personality Traits to Video Game Preference; 2013. Available from: <http://hcil2.cs.umd.edu/trs/2013-08/2013-08.pdf>
6. Peever N, Johnson DM, Gardner J. Personality & video game genre preferences. Proceedings of the 8th Australasian Conference on Interactive Entertainment: Playing the System (IE '12 ); Auckland, New Zealand: ACM; 2012. 3:20:1–20.
7. Steam. Popular Tags. Valve. Available from: [http://store.steampowered.com/tag/browse/#global\\_19](http://store.steampowered.com/tag/browse/#global_19)
8. Risk of Rain. Hopoo Games and Cuckfish LTD. 2013. Available from: <http://store.steampowered.com/app/248820/>
9. World of Warcraft. Blizzard Entertainment. Available from: <http://us.battle.net/wow/en/>
10. MapleStory. Nexon. Available from: <http://maplestory.nexon.net/landing/>
11. EverQuest. Daybreak Games. Available from: <https://www.everquest.com/home>
12. Yee N. Motivations for Play in MMORPGs. 2005. Available from: <http://www.nickyee.com/daedalus/archives/pdf/3-2.pdf>
13. Hunicke R, LeBlanc M, Zubek R. MDA: A formal approach to game design and game research. Proceedings of the AAAI Workshop on Challenges in Game AI. 2004.
14. McCrae RR, John O P. An Introduction to the Five-Factor Model and Its Applications. Journal of Personality. 1992; 60:175–215.
15. NEO Personality Inventory-Revised Manual Overview. Available from: <http://www.unifr.ch/ztd/HTS/inftest/>

- WEB-Informationssystem/en/4en001/d590668ef5a34f-17908121d3edf2d1dc/hb.htm
16. Widiger TA. Five Factor Model Rating Form. 2004. Available from: [www.uky.edu/~widiger/ffmrf.rtf](http://www.uky.edu/~widiger/ffmrf.rtf)
  17. Costa PT, McCrae RR. Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI); 1992.
  18. Locke K. NEO-FFM Scoring. Available from: [http://www.webpages.uidaho.edu/klocke/neo\\_scoring.htm](http://www.webpages.uidaho.edu/klocke/neo_scoring.htm)
  19. Scheck K. Study of Player Personality, Motivations, and Avatar Customization. 2015. Available from: <https://docs.google.com/forms/d/1BnuBblvR3G9nb0-1rV2LGccHSY-Ce7TqLNOeGVGp0nQA/edit>
  20. United States Census Bureau. American Fact Finder. Available from: <http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>
  21. Dakota State University. Student Profile. Available from: <https://www.sdstate.edu/about/upload/Student-Profile-2013.pdf>
  22. McCrae RR, Costa PT. A contemplated revision of the NEO Five-Factor Inventory. *Journal of Personality and Individual Differences*. 2004; 36:587–596.