



Research Report

Personality and behavior in a massively multiplayer online role-playing game



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ABSTRACT

Massively multiplayer online role-playing games (MMORPGs) present new and important opportunities for studying the connections between personality and behavior. Players of the MMORPG *World of Warcraft* were surveyed on their personalities and frequency of different behaviors within the game. An exploratory principal components analysis of a *World of Warcraft* in-game behavior survey revealed six components: Player-versus-Player, Social Player-versus-Environment, Working, Helping, Immersion, and Core Content. Significant correlations with HEXACO personality traits were found for each component. Player-versus-Player activities were primarily related to low levels of Honesty-Humility and also to high levels of psychopathic traits. Social Player-versus-Environment activities were primarily positively correlated with Extraversion, Working activities were positively correlated with Conscientiousness, Helping and Immersion activities were positively correlated with Openness to Experience, and Core Content activities were positively correlated with Emotionality. The authors discuss the implications of these results for future research and game design.

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1. Introduction

Online video games are continually increasing in popularity and attract an increasingly diverse player-base (e.g., Williams, Yee, & Caplan, 2008). They are also increasing in complexity, so that individuals face fewer limits on their actions within many of these games (Yee, 2006a). Massively multiplayer online role-playing games (MMORPGs), in particular, offer players many game-play options, as they allow players to interact with other players in open-world virtual landscapes filled with a variety of possible activities. These games attract millions of players of all ages, nationalities, and occupations, and average playing time for these games is usually in excess of 20 h per week (Griffiths, Davies, & Chappell, 2004; Williams et al., 2008; Yee, 2006a). The popularity of these games and the diversity of behaviors available within them make these games an important topic for research.

One of the most popular MMORPGs currently available is *World of Warcraft*, which was launched in 2004 and still retains well over 7 million subscribers as of December, 2013 (Makuch, 2014). In this game, players create a character or avatar (a virtual representation of themselves) belonging to one of two factions (Alliance or Horde)

and use this character to combat adversaries in a vast fantasy-type world. Players are distributed across hundreds of different realms (or servers), each of which contains an identical copy of the game. Realms differ according to the type of play that is supported: in Player-versus-Environment (PvE) realms, the emphasis is on combat with game-generated monsters (and player-versus-player combat is optional); in Player-versus-Player (PvP) realms, both player-versus-player and player-versus-environment combat are available (and player-versus-player combat is harder to avoid); in Role-playing (RP) and Role-playing – PvP (RP-PvP) realms, the emphasis is on role-playing (or behaving in a way that is consistent with the fantasy-world of the game; for example, players speak and act “in character” as elves, trolls, etc.).

Thus, players of *World of Warcraft* are able to choose whether to primarily battle game-generated opponents or to combat other players. Players are also able to choose whether to focus on optimizing their characters by progressing through the most difficult content in the game (i.e., multi-player *raids*) or to focus on other activities, such as completing quests, exploring the virtual world of the game, working on professions (i.e., gathering materials and creating goods), or battling other players. Throughout this game, players can choose whether to adventure primarily alone, or whether to join other players (either temporarily or on a long-term basis in a *guild*) to defeat enemies. With so many options to choose from, it seems likely that different players will choose different

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activities and opponents. The aim of the current study, therefore, is to analyze the connections between self-reported behaviors in World of Warcraft and important personality traits.

1.1. Personality and behavior in online games

When a variety of choices are available, different players can choose different ways to play and things to do in online games. One of the earlier theories regarding these differences was proposed by Bartle (1996), who postulated that there are four major types of players of MUDs (multi-user dungeons, a precursor to MMORPGs), each of which is defined by preferences for different activities in-game. According to Bartle (1996), *Killers* prefer harassing or imposing on other players, *Socializers* prefer interacting and socializing with other players, *Achievers* prefer completing game content, and *Explorers* prefer investigating the virtual world of the game.

Subsequently, research has supported the idea that players differ in their in-game behaviors and preferences; previous studies have shown that players have different motivations for playing, preferences for avatars, and engage in different in-game behaviors. For example, in World of Warcraft, men prefer participating in player-versus-player activities and raids, while women tend to prefer exploring and working on professions (Yee, Ducheneaut, Shiao, & Nelson, 2012). In addition, older players prefer doing quests while younger players prefer player-versus-player activities and raids (Yee et al., 2012).

Although these demographic variables provide some clues as to the ways that players differ in their behaviors in online games, personality traits are perhaps even more important to consider as predictors of in-game behavior. Personality traits have a strong influence on how people think, feel, and behave in the real world, and should, therefore, influence virtual (i.e., in-game) behavior as well. Although individuals generally report behaving much the same in online games as they do in the real world (Bayraktar & Amca, 2012), there are a number of characteristics of online environments (such as anonymity and invisibility) that may lead players to engage in different behaviors online from those they would commit in the real world (Suler, 2004). It is, therefore, worth studying the connections between personality and in-game behavior to determine exactly what influence personality traits may have.

There has been relatively little research conducted on the specific connections between personality and in-game behavior. However, some research has focused on the related topic of the connections between personality and motivations for playing online games. The focus of the previous research has been on the Big Five or Five Factor Model of personality, which consists of the traits of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (John, Naumann, & Soto, 2008).

Some of the research on personality and motivations for play suggests that the correlations are reasonably consistent with what one might expect based on connections between personality traits and real-world behaviors. For example, Openness to Experience has been found to be related to immersion, independence (Graham & Gosling, 2013), discovery, and role-playing motivations (Jeng & Teng, 2008). Extraversion is related to socialization, leadership (Graham & Gosling, 2013), and teamwork motivations (Jeng & Teng, 2008). Agreeableness is positively related to socialization (Graham & Gosling, 2013) and relationship motivations (Park, Song, & Teng, 2011), while Neuroticism is negatively related to teamwork (Jeng & Teng, 2008) and leadership (Graham & Gosling, 2013) motivations.

Certain other correlations are less obviously consistent with personality-behavior correlations in the real world. In particular, Park et al. (2011) reported that both Extraversion and Agreeableness were correlated with both achievement and adventure motivations.

Further, Conscientiousness has been found to be negatively related to an achievement motivation (Graham & Gosling, 2013), which is unexpected given that Conscientiousness is positively related to achievement in the real world (John et al., 2008). However, inconsistencies with real-world relationships may be due at least in part to the nature and number of items used to measure the motivations in these studies, and the possibility remains that personality traits can be reliable predictors of motivations to play online games.

Motivations for play are related to actual in-game behaviors in predictable ways (Billieux et al., 2013). Exploration behaviors, as measured by the number of exploration achievements earned by players' primary avatars, are related to discovery motivations. Likewise, player-versus-player behaviors are related to competition motivations, and achievements for completing raids and dungeons (which require the coordinated efforts of several players) are related to motivations like advancement and teamwork (Billieux et al., 2013).

Thus, research on the connections between personality and motivations provide some potential clues regarding the expected connections between personality and behavior. Additional information is provided by some research on preferences for avatars; for example, Agreeableness is positively related to preferences for avatars with helping-related occupations like monk and cleric, and negatively related to preferences for avatars with killing-related occupations like assassin (Park & Henley, 2007). Therefore, the connections between personality and motivations for play, as well as personality and avatar preference, are often (but not always) consistent with the content of the personality traits involved.

Some research also suggests that the relationships between personality and in-game behavior are consistent with personality-behavior correlations in the real world. For example, when playing a violent (but not online) video game, individuals with more aggressive personalities engaged in a greater number of aggressive behaviors than those who were less aggressive (Peng, Liu, & Mou, 2008).

Likewise, Yee, Ducheneaut, Nelson, and Likarish (2011) found several meaningful correlations between Five Factor Model personality traits and in-game behaviors (as measured by achievements and character statistics) in World of Warcraft. Extraversion was associated with completing more high-level challenges that require interaction and cooperation with groups of players (i.e., dungeons and raids), while those lower in Extraversion had more achievements relating to solo activities like questing and fishing. Agreeableness was associated with performing more friendly visual interactions (e.g., the "/hug" emote), and low Agreeableness was associated with having killed more players in player-versus-player combat. Conscientiousness was associated with having high profession levels and having collected many pets, tasks which require diligence to complete. Openness to Experience was associated with having completed more exploration achievements. Thus, many of the correlations observed by Yee et al. (2011) seem largely consistent with personality and behavior patterns observed in the real world.

In contrast, one previous study has found no connections between Five Factor personality traits and in-game behavior. In a study of World of Warcraft, McCreery, Krach, Schrader, and Boone (2012) examined the correlations between each Five Factor personality trait and a corresponding set of behaviors (e.g., between Agreeableness and a set of pre-defined "agreeable" in-game behaviors), and found no significant relationships. However, this study may underestimate the possible relationships between player personality and in-game behavior due to potential issues with the behavioral measures used. Neither internal consistency reliability estimates of the behavior sets, nor a factor analysis of the behavior items, are reported. Thus, it is not clear whether the items in each set form appropriate and reliable scales. Further,

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