Differences in the self between real life and MMORPGs measured through the HEXACO personality model
A case of EVE Online

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**Lokaverkefni til BS-gráðu
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HÁSKÓLI ÍSLANDS

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Abstract

The purpose of this thesis is to explore the differences in the self between the virtual world of MMORPGs versus the real world using two report forms of the HEXACO Personality Inventory. The sample analysed consisted of 521 participants, aged 13 to 58, with 94.6% being male and 5.4% being female. There was a significant difference in all six HEXACO domains between online and real life measures. On four of these factors, the difference was considered to be prominent and was analysed further. A correlation was also found between the HEXACO domains and the miscellaneous questions set forth by the researchers. Findings suggested that people change their self on purpose within MMORPGs, because they adapt their behaviour to match beneficial in-game attributes. The practical implications relate to behaviour prediction, whereas theoretical implications relate to the theories about the self and how these theories translate to virtual worlds. Despite the untested nature of the method, these results provide an insight into how people change their behaviour as they log into MMORPGs.

Your appearance now is what we call residual self image. It is the mental projection of your digital self.

–Morpheus, The Matrix (1999).

Reality is not always what it seems. This is the premise of the popular movie *The Matrix*, released in 1999. After 'waking up' in the real world, Mr. Anderson discovers that he has been living in a virtual 'dream' world his whole life, called the Matrix. He learns that his mind can be connected to this virtual world at any time and that it feels as real as the real world itself. His biggest discovery, however, is the fact that he can manipulate things in the virtual world in ways impossible in the real one. Once he enters the Matrix, he can mentally choose his appearance, or as Morpheus puts it, his residual self image. Inside he can obtain new items with a click of a mouse and he can even bend the laws of physics. These new 'powers' have a significant impact on him and he becomes more confident and starts to behave differently. He even uses a different alias once he discovers his new powers and starts to call himself Neo, instead of Mr. Anderson. It is as if his 'self' goes through radical changes as it crosses the barrier and 'goes online' into this virtual world (Wachowski & Wachowski, 1999).

Now *The Matrix* is just science fiction, but what would happen in reality if someone was to enter a 'virtual world'? Would he keep his old familiar self or could he re-invent himself by forming a new identity? With the introduction of readily available personal computers (PCs), and the vast advances in the computer industry, a new virtual world has actually become a reality. The development of massive multiplayer online role-playing games (MMORPGs) has, in fact, created a new frontier for people to live and express themselves. Since MMORPGs are on the rise with more than 20 million online subscribers (Van Geel, 2012), focus in psychological and other scientific research

has shifted more and more to the study of new kinds of communities that are forming within virtual worlds. The popularity of these games is in fact what inspired the authors of this thesis to research this phenomenon.

What follows is exploratory research into differences in the self between the virtual world of MMORPGs versus the real world. As of yet, the term "virtual world" has no commonly agreed-upon definition, and has therefore been used differently at different times by various academics (Bell, 2008). In this thesis, the term will be used in the same sense as MMORPGs, meaning that virtual worlds will have to meet six criteria: *persistency*, *physicality*, *avatar-mediated play*, *vertical game play*, *perpetuity*, and *social interaction* (for more information see Chan & Vorderer, 2006). As mentioned before, new kinds of communities have been formed within virtual worlds and they will from here on be called *virtual communities*. Their counterparts in this study will be the communities in the real world, from now called *real life communities*. The differences in the self will be examined with the help of personality questionnaires based on the HEXACO model of personality which will be better explained later on. To put this thesis in context it is pertinent to take a historical look at MMORPGs along with examining theories that relate to the subjects of this study. But first, the field in which this study was conducted will be briefly examined: a MMORPG called *EVE Online*.

EVE Online

EVE Online is set in a fictional space world called *New Eden* and takes place in the distant future. Players take on the role of a spaceship pilot who must fight, gather resources and form relationships with other players to survive and progress. Players start by creating and customising a character, also known as an avatar, which is a visual representation of themselves within the game. They then have the opportunity to specialise their character by training various skills to suit their favourite play style. What

makes *EVE Online* so unique compared to other MMORPGs is that the game is run on one server and not on many different servers (MMORPG, 2012). The single server set up means that the community as a whole remains intact and is not broken down in to smaller communities, with each community located on a different server, like in most other MMORPGs. Every player of *EVE Online* therefore has the opportunity to interact with all the other players and build reputations as well as possibly having a lasting impact on the virtual world within the game. With just over 400,000 subscribers (Rubens, 2012), *EVE Online* is the largest single server MMORPG in the world and is therefore a perfect stage to conduct this research.

History of MMORPGs

Two types of social fantasy games emerged in the 1970s which would later influence the development of MMORPGs: table top role-playing games (RPGs) and multi-user domains (MUDs; Barnett & Coulson, 2010). In 1974, *Dungeons & Dragons* was published, which was the first table top RPG (Douse & McManus, 1993; Waggoner, 2009). Since then, a wide variety of RPGs have been published, but most of these games share a few commonalities. RPGs usually take place in a fictional fantasy world which is controlled by one player who is called the Game Master (GM). He determines what the world will look like, who the inhabitants will be and what is going to happen during each game session. A typical game session contains a set of challenges which have been prepared by the GM before the session begins. All the other players create their own fictional character that will be living in that world and they will directly control their in-game actions. The players call out what they want their characters to perform and the GM then tells them what happens as a result of their actions. As the story continuous through the fictional world, the players' characters evolve, gain new powers and abilities, and thus become stronger. The end goal of each session is to overcome the challenges

prepared by the GM by working together as a group. Once the session is over, the game is put on hold until the next session starts. Players keep their powers and abilities between sessions and therefore become more powerful as the sessions progress (Kim, 2008; Waggoner, 2009). To simplify things, in 1998 Dombrower defined RPGs thus: "The player assumes a persona that changes over time. The persona is assigned a range of physical and other attributes that change over time. These attributes also change as a result of the user's actions. The art of playing RPGs lies in mastering the complex relationships," (p. 31, cited by Waggoner, 2009).

Colossal Cave Adventure was the first adventure game made for PC when it was published in 1975. It had many basic features of the table top RPG *Dungeons & Dragons* including a computer controlled GM. The game was text-based which means that it had no visual aspects. All visual settings where simply described by text, much like reading a book. Players could move through the world by typing text-based commands and once they had moved, a text would appear to describe the new surroundings they were in. There was however one great difference between these PC adventure games and RPGs. While RPGs involved many players who could interact with each other, the PC adventure games could only be played by one player at a time (Stewart, 2012).

This changed in 1978 when the first text-based adventure game to support multiple users was published, called *Multiple-User Dungeon* or simply *MUD*. This opened up a whole new genre of games that were simply called MUDs, named after their originator, and in the years to follow a variety of these games were published. By logging in to a virtual world, originally hosted on educational networks, players would be able to create their own fictional characters within that world. The possibilities for the players differed between games, but the most common aspects were that they could explore different

areas of the world, fight different kinds of monsters and complete a variety of quests. This would give them experience so that their characters could become stronger, which in turn would allow them to explore more dangerous areas, fight stronger monsters and complete more difficult quests. By gaining experience, the players would also unlock special abilities in order for their character to perform better and they would be able to equip more powerful items. MUDs are in this way closely related to tabletop RPGs with one big difference: MUDs are played on the PC through network play, while RPGs are played in face-to-face circumstances. Another important difference is that while RPGs could be put on hold at any time and continued later on, the fictional world in a MUD would continue to persist and evolve even if the player logged off from the game (Nass, 2007). Although MUDs are only text-based virtual worlds, many claim that they feel as real as the real world itself, with some even going as far as stating that reality is just another window on the PC (Turkle, 1995).

The graphical aspects of MUDs started to emerge in 1985 when the game *Habitat* was published, but the first fully graphical MUD didn't appear until 6 years later with the publishing of *Neverwinter Nights* in 1991. From then on, the graphics started to drastically improve with the fast-paced advancement in the computer industry. The lifting of the NSFNET (National Science Foundation Network) restrictions in 1995 was a milestone in the history of online gaming, meaning that the internet was no longer restricted for educational purpose only, but was now open for everyone to explore (Floyd, 2006). This created the opportunity for game developers to take online gaming to a whole new 'massive' level, which caused the term "graphical MUD" to fall out of favour. The new term "MMORPG" was coined in 1997 to better describe the massive scale of these new online games (Ameritopia, 2012). To emphasise this massive scale of

today's online games, thousands were playing the first graphical MUDs while the new MMORPGs consist millions of players (Van Geel, 2012).

While these millions of players are split between a total of 606 different MMORPGs (MMORPG, 2012), these games can usually be categorized into two distinctive groups: The Sandbox and The Theme Park. The Theme Park design is more rigid in nature, offering less freedom within the virtual world, as players are forced to go on 'rides' to progress within this world. These rides are often dungeons or encounters that are very standardized and are not affected in the long term by the player's progression through it. Like a rollercoaster in a theme park, it will always be the same ride, no matter how often you ride it. Players' impact on the virtual world is also limited, as they cannot permanently burn cities to the ground or claim territories for their faction or alliance. The whole infrastructure is predetermined and players are forced to adhere to their designated roles such as 'warriors' or 'wizards'. A good example of this type of game is the immensely popular *World of Warcraft*. On the other hand, there is The Sandbox game design. As most people remember from childhood, the sandbox can be a harsh and unforgiving place. Players' actions in these games can have lasting effects on the environment and can, in fact, affect the virtual world as a whole. The economy is usually player-driven and characters are created with more freedom in regard to roles and specializations. A good example of this type of game would be *EVE Online* (Spohn, 2011).

Virtual Communities

A frequent stereotypical misunderstanding is that the common gamer is a young, pale and socially inept man (Williams, 2003, cited by Barnett & Coulson, 2010). Looking at virtual communities as a collection of stereotypical gamers, it's not unlikely that many non-gamers would perceive these communities as highly different from real life

communities. A meta-analysis study conducted by Barnett and Coulson (2010) showed that this view of gamers is actually far from the truth, stating that "it is even possible to conclude that gamers are not a specialized sample and are not much different from the general population," (p. 169). A majority of online gamers are in fact physically healthier than non-gamers (Williams, Yee & Caplan, 2008) and live quite successful lives with families and careers of their own (Yee, 2006). An important commonality is that the same positive social capital holds for virtual and real life communities when it comes to making new friends and forming groups (Barnett, Coulson & Foreman, 2009, cited by Barnett & Coulson, 2010), indicating that these communities are mostly based on the same social norms.

These two communities often intertwine together where people from the real world show activities in virtual worlds much interest. An example of this is an epidemic incident within the game of *World of Warcraft*. The epidemic was in the form of a 'virus' that could spread from player to player via proximity and it was theorized that its spread might mimic that of its non-virtual counterparts. This event, therefore, caught the eye of scientist as it was thought to be a good predictor to how people would react to an epidemic in the real world (Lofgren & Fefferman, 2007). Another example of the immersion of these communities is the decision of *CCP*, the creators of *EVE Online*, to hire a real life educated economist to analyse the economics within the virtual world (Vísir, August 7, 2007). Furthermore, the growing role of computer games in psychological research is evident as they might now be overtaking chess as the staple for cognitive research concerning games (Upson, 2012). The appeal of these games for researchers lies in the added complexity and constant logging of behaviour that, when mastered, could be a potent tool for measuring, analysing and understanding behaviour.

There are, however, two important differences between virtual and real communities. Firstly, they follow a different set of rules, referring to the fact that many of the things society would frown upon like killing and stealing are not prohibited in-game, and are in some cases even encouraged. For example, many MMORPGs provide the option for player versus player (PVP) combat, meaning that people have the chance to fight and kill each other in game. Many games even have battlegrounds where two teams encounter each other in PVP combat with the sole purpose of wiping out the other team. When asked why people like PVP combat, a MMORPG player under the alias HotTomatoes (2012) answered this question so: "Because living in constant fear of a player bombarding your house and stealing all your stuff is fun." Few people would list these things as 'fun' in the real world, indicating how ones thinking can change while playing a MMORPG. The second important difference is the form of communication, where real life communities make more use of face-to-face communication, while virtual communities rely almost exclusively on *computer-mediated communication* (Zhong, 2011), a concept that will be explained in detail later on.

These differences offer new possibilities to people as they move from real communities to virtual ones. Computer-mediated communication, along with anonymity, has for example given people the opportunity to experiment with their self-presentation (Bargh, McKenna & Fitzsimons, 2002), especially through the use of avatars (Dunn & Guadagno, 2011; Vasalou & Joinson, 2009; Yee & Bailenson, 2007) and even to escape their own reality (Williams, Kennedy & Moore, 2011) through MMORPGs. In other words, these virtual communities allow online gamers to explore different kinds of the self and even to form new identities (Turkle, 1995). It's like The Mittani (2012), a prominent member of the *EVE Online* community, once said on the official forums of *EVE Online*: "It's one thing to play a villain in an online roleplaying game … and do my

level best to convince everyone that I'm an unrepentant space villain, as that kind of facade provides an in-game advantage to me and my alliance. But I am not that character in real life." It's therefore apparent that MMORPGs give people the chance to change themselves, but before one can analyse what precisely changes within the self, it's necessary to understand what the self actually represents.

The Self

"Who am I?" is one of the most commonly asked questions in philosophy and can be traced all the way back to ancient Greeks (Leahey, 2006). Many ordinary people ask themselves this question and strive to find an answer to it. It's one of the things that define people because identifying one's self is a fundamental part of being human. The idea of a *self*, however, is historically speaking relatively new as it only started to get real attention with Freud's psychodynamics early in the 20th century. Since then, the self as a phenomenon has been the focus of much research and a variety of theories have been proposed to explain this concept (Hogg & Vaughan, 2011). As many as 31,000 social psychological publications on the self were published over a two decade period to the mid-1990s (Ashmore & Jussim, 1997, cited by Hogg & Vaughan, 2011).

Bargh, McKenna & Fitzsimmons (2002) have analysed a number of prominent theories about the self. Those theories about the self that have prevailed usually assume that humans possess multiple senses of self. They also tend to focus on the fact that individuals strive for a 'better' sense of self to obtain inner peace. In that sense, individuals both possess a self that describes how they are in the present and at least one other self that they strive to become. Among the prominent theories today in the field of self is the *self-discrepancy theory* set forth by Higgins (1987). His theory states that humans possess three types of self-schema: *actual*, *ideal* and *ought*. Here, the ideal self represents how an individual interprets the perfect side of who he wants to become,

while the ought self refers to how he thinks society would want him to be. Both of these selves act in this case as social 'guides' for individuals to strive for inner peace, while the actual self describes how they are seen by themselves at present. According to this theory the discrepancy is twofold. On one hand it refers to the difference between the actual and ideal self, while on the other hand it refers to the difference between the actual and ought self. If the individual fails to reduce this discrepancy between the selves, negative emotions ensue. The strife for inner peace then refers to the avoidance of these negative emotions, a process known as 'self-regulation'. Another important theory is one proposed by Rogers (1951) where he argues that individuals strive for a *true self*. The true self is a representation of who individuals really are and failing to express this inner self causes dissatisfaction. People thus pursue their true self so they can express themselves more freely, which in turn will give them a feeling of satisfaction. These are only two of a number of important theories that address a 'hidden' self that individuals strive to attain. Among other contributors are Goffman (1959) and Jung (1953) who both made a distinction between a 'public self' and an 'inner self', and Markus and Nurius (1986) who talk about 'possible selves' (all cited by Bargh, McKenna & Fitzsimmons, 2002).

It's easy to argue that humans possess a self, but how is it determined what the self is, in particular if there is more than one? The first thing that comes to mind for most people is to look inside and examine one's private thoughts. It may indeed be common sense as well as an old fashioned method, as it can be traced all the way back to Plato of ancient Greece. At one point he describes Socrates' words thus: "…why should we not calmly and patiently review our own thoughts, and thoroughly examine and see what these appearances in us really are?" (Theaetetus, n.d., p. 155, cited by Perner, Kloo & Stöttinger, 2007). Almost 2000 years later, this procedure was introduced as a scientific

method by Wundt which he then called introspection. This method, however, has been criticized as unreliable which has led many scientists to renounce it. The main argument for the lack of reliability is that inner thoughts cannot be measured directly and are therefore too subjective (Leahey, 2006). Bem (1967, 1972) suggests the more reliable way to determine one's self is to observe behaviour. This is precisely what his *self-perception theory* is based on. It states that people do not only make attributions for others based on their behaviour, they also make self-attributions according to how they behave themselves. "I enjoy being good to others, therefore I must be a good person," is just as valid as "He is good to others, therefore he must be a good person." In other words, according to Bem, there are no differences between self-attributions and other-attributions. In this way, people both determine other people's personality as well as their own, based on their internal interpretations of behaviour (Hogg & Vaughan, 2011). Simply put: "You are how you behave."

The self-perception theory leads to the question whether people do the opposite as well. Instead of determining their persona based on their behaviour, could it be that people change their behaviour to fit a certain persona? Goffman (1959) compared self-presentation to a theatre where people have a front stage and a back stage. While always having the same back stage, they put different characters on the front stage as an adjustment to the audience. This means that people behave differently in various situations and assume the role that they presume will portray them in the most positive light. An individual can, for example, be a foul mouthed rocker around his friends, a strict but aloof boss at work, all the while he is a sensitive loving father around his children. This effort to create an impression of oneself is called *self-presentation* and is known to have two subgroups: strategic and expressive. Strategic self-presentation is defined as an attempt to manipulate how others perceive you (Jones & Pittman, 1982),

while expressive self-presentation is defined as a process where people try to gain validation (Schlenker, 1980, both cited by Baumeister, 1999). It's therefore evident that people tailor their behaviour to fit a certain persona, although the reasons for it can differ. They can for example have strategic reasons for wanting to be perceived as dangerous or competent and expressive reasons to want to fit into a group. The communication with others defines how others perceive them as individuals. Models of communication, however, have been going through vast changes with the introduction of computers and the internet.

Computer-Mediated Communication

Society as we know it is rapidly evolving and the internet is starting to play a bigger role as a cohesive element. Take Facebook, for example, which advertises on its homepage that its social networking service "helps you connect and share with the people in your life" (Facebook, 2012). As of 31st December 2011 it was estimated that Facebook had around 845 million active users (United States Securities and Exchange Commission, 2012). At the same time the United States Census Bureau (2012) estimated that the world population was around 6,985 million people. This means that about 12.1% of the world population has an active Facebook account, while only 32.7% of the world population has internet access (Internet World Stats, 2012). These numbers emphasize just how many people have started to use the internet to keep in touch with society and their social circles.

People are communicating more and more through the internet by means of text-typing which has commonly become better known as *computer-mediated communication* (CMC). CMC has exploded outwards in the last 15 years but research in this area is still in its infancy. When interacting through text-typed messages like CMC, all paralanguage and non-verbal communication is restricted (Hollingshead, 1998). Also,

non-verbal vocal and physical cues are missing from this interaction, limiting the amount of information that can be exchanged (Hollingshead, 1996). This means that the receiver has to interpret the meaning of the message through its words alone. Yet, with time, people will adapt quite successfully to this kind of communication, as is apparent by the integration of these games into mainstream media, and may even start to interact in online scenarios as if they weren't computer-mediated at all (Walther, 1996). People can also feel less inhibited when interacting through CMC caused by an effect called the 'participation-equalisation effect'. They are less identifiable meaning that their personal status becomes ambiguous on the internet. Therefore, people perceive everyone as equals and will interact correspondingly. The impact of the effect depends on how anonymous an individual feels on the internet (Spears & Lea, 1994, cited by Hogg & Vaughan, 2011). This sense of anonymity, along with the hidden physical cues caused by CMC, has been suggested to lead to a form of deindividuation within virtual worlds (McKenna & Bargh, 2000).

Personality

It may seem a daunting task to try to measure a construct as vague as the self directly, therefore other methods must be used to measure it indirectly. One possibility is to measure it through personality. When different methods of measuring personality are examined, it's important to realise that psychological and personality constructs are in fact only inferred or 'postulated' characteristics of people (Cronbach and Meehl 1955). This means that if these constructs are to be measured, one must assume that they exist in the first place, and must thus find ways to operationalize them. Collecting behavioural data is potentially useful in operationalizing personality constructs, because "in personality psychology, traits are overtly expressed through behaviour," (p. 8, McDonald, 2008). Personality is also defined by Nolan-Hoeksema, Fredrickson, Loftus

and Wagenaar (2009) as "the distinctive and characteristic patterns of thought, emotion, and behaviour that defines an individual personal style of interacting with the physical and social environment," (p. 462). Examining behaviour can therefore be a good measurement for determining personality. The self-discrepancy theory states that individuals also rely on behaviour when making attributions for both themselves and others, indicating that the constructs of personality and the self are closely related. Personality tests, however, are operationalized for personality attributes and can therefore not be used to define the self directly. Yet, because these constructs are related, a difference in personality should mean a difference in the self. Personality tests are thus suitable instruments for measuring a difference within the self, as long as it's only the difference that's being assessed, and not the self explicitly.

Despite this theoretical framework, everyday usage of the term personality is quite different. For example, one might describe John as "extroverted" or "aggressive" while Jack is said to be "closed" or "introverted". Such categorization is perhaps a simplification of the matter but useful nonetheless. However incomprehensive this description of John is, it still does a better job than simply saying: "Well, he's John." Since the discovery of the personality construct, it has long been the tradition to sort attributes into broad domains or dimensions. These dimensions are further categorized into subgroups and smaller units of measurement which may pertain to individual traits (Nolan-Hoeksema et al., 2009). Measurements of these traits are then used to sort people into categories which can be used for a myriad of purposes from hiring summer staff (Landy & Conte, 2010) to assessing risk for depression or other mental disorders (Nolan-Hoeksema, 2011).

The most commonly known tool for measuring and assessing these attributes are the Big Five personality factors. Another instrument of personality assessment comes

from the six factor HEXACO model. The inventory derived from this model is called the HEXACO Personality Inventory. This inventory is free for all to use for research purposes and has shown good psychometric qualities in the past (Ashton & Lee, 2009). Therefore it was decided that this inventory would be used to conduct the experiment.

The HEXACO Personality Inventory

The HEXACO Personality Inventory-Revised (often shortened to The HEXACO-PI-R) is an instrument used to assess six major dimensions of personality. The acronym HEXACO implies the assessment of the following six dimensions: Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness and Openness to Experience. These scales then divide into subgroups which will be listed below under the description for the corresponding domain-level scales. Examples of the report forms used do not follow as they are readily available online for free (Ashton & Lee, 2012).

To be able to interpret the results that follow later in this paper, one must first obtain an overview of what the individual scales on the HEXACO inventory represent. The following information about the domains is obtained from a summary made by Ashton & Lee (2009). People that get very high scores on the *Honesty-Humility* scale try to avoid using others for personal gain, generally follow the rules, are not interested in excessive wealth or luxuries and do not strive for elevated social status. Conversely, people with low scores on this scale will act in a manner opposite to that which was just described. The subgroups for this domain are: Sincerity, Fairness, Greed Avoidance and Modesty.

People with very high scores on the *Emotionality* scale experience fear of physical dangers, anxiety about the stresses of life, a need for emotional support from other people, empathy and emotional attachment to others. On the other hand, people with low scores do not fear physical danger, are relaxed in stressful situations, do not like to share

their worries and feel emotionally distant from others. The subgroups are: Fearfulness, Anxiety, Dependence and Sentimentality.

People at the very high end of the *Extraversion* scale have a positive self-esteem, confidence when leading a group or speaking in public, enjoy social gatherings and are enthusiastic and energetic. Conversely, people with low scores on this scale feel that they are unpopular, feel awkward when they are the centre of attention, are not excited by social gatherings and are less lively and optimistic than others. The subgroups of Extraversion are: Social Self-Esteem, Social Boldness, Sociability and Liveliness.

Those who get very high scores on the *Agreeableness* (versus anger) scale are quick to forgive the wrongdoing of others, are not harsh in judging others, are easy to cooperate with and can compromise when needed. They can also control their temper easily. People with low scores do, conversely, not forgive easily and hold grudges against those who have wronged them. They are critical of others, are stubborn in defending their viewpoints and feel anger when challenged or mistreated. The subgroups for Agreeableness are: Forgiveness, Gentleness, Flexibility and Patience.

People with very high scores on the *Conscientiousness* scale are disciplined and organize their time and surroundings accordingly. They work toward their goals in a structured way and strive for perfection and accuracy in their tasks. They also deliberate carefully before making decisions. On the other hand, those with low scores on this scale are less concerned with order in their surroundings or work, they try to avoid difficulties and challenges in tasks and goals, are content with work that contains mistakes and they make decisions on impulse and without deliberation. The subgroups of Conscientiousness are: Organization, Diligence, Perfectionism and Prudence.

Those with very high scores on the *Openness to Experience* scale are easily enthralled by the beauty of art and nature, are curious about various subjects, are highly

imaginative in everyday life and are interested by unusual ideas or people. Conversely, people with low scores are relatively unimpressed with most works of art, are not intellectually curious, avoidant of creativity and are not attracted to radical or unconventional ideas. The subgroups of Openness to Experience are: Aesthetic Appreciation, Inquisitiveness, Creativity and Unconventionality (Ashton & Lee, 2009).

The HEXACO Personality Inventory – A Short History

Development of the HEXACO personality inventory began in the year 2000. The authors aimed to expand on the personality dimensions from lexical studies of personality structures (for further readings on lexical studies, see Saucier & Goldberg, 2001). Previously, the leading theories of personality were mostly based on the Big Five personality factors (see John & Srivastava, 1999). However, more recent studies based on large sets of adjectives from many different languages set forth six dimensions, called the HEXACO personality factors. Because of the lack of research into these new six domains, the authors of the HEXACO-PI decided to explore these factors. It was expected that the HEXACO domains would correlate strongly with their corresponding NEO-FFI domains (Ashton & Lee, 2009). These expectations turned out to be justified as the HEXACO domains correlated well with their NEO-FFI counterparts on most counts. By 2002 they had started using a 108-item self-report version for research and it included six scales that each had 18 items. Those six scales encompassed a wide array of content, but at that time they had not been divided into "facet-level subscales assessing distinct narrow traits." (Ashton & Lee, 2012). After some development, the result was a version consisting of six broad factor scales each with a subgroup of four facet scales that were narrower and more focused. In addition to all these changes made, the inventory was also adapted for an observer report version. The full length version

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spanned 192 items (eight items per facet scale) and the half-length version spanned 96 items in a configuration of four items per facet scale (Ashton & Lee, 2012).

Several changes differentiate the revised version of the HEXACO inventory from the older version. For example: one of the facet scales within Extraversion, called Expressiveness, was removed and replaced with Social Self-Esteem. Also, the interstitial Negative Self-Evaluation scale was removed. Some facets were removed because of difficulties related to the translated version of the scale (Ashton & Lee, 2012). After these changes, the HEXACO-PI-R assesses six factors, with each factor having four facet-level scales (making sub-facets a total of 24). In addition to these, there is a 25th variable called Altruism versus Antagonism. Therefore the HEXACO-PI-R contains 200 items in its full length version (HEXACO-200), or 100 items in its half-length version (HEXACO-100).

A shorter version of the HEXACO-PI-R was developed as a response to situations where there wasn't enough time for the full-length version. The authors of the HEXACO-60 decided that each one of the six scales would contain 10 items that would, together, cover a wide range of content. On this shortened scale, at least two items would represent each of the four traits of the longer scales. The authors aimed to create an instrument that would preferably show relatively high internal-consistency reliability (although some of it would have to be sacrificed because of the brevity and short breadth of the scales), low interscale correlations and other qualities they deemed important (Ashton & Lee, 2012). After narrowing the instrument down to 60 items it was tested and was found to demonstrate the desired properties. As for those psychometric properties, the internal consistency reliability was found to be around 0.70 despite the reduced length and content of the HEXACO-60. Intercorrelations between the sub-scales were all below 0.30 and were thus deemed acceptable when compared to similar

measures such as those found on the Big Five personality factors. All the items showed primary loadings on their corresponding factor when six factors were extracted and rotated. When the self-report and observer report forms were compared, they corresponded quite well on all six scales, with all scores ranging above 0.45. The shorter HEXACO-60 had, overall, very similar properties as the longer HEXACO-PI-R and showed a modest decrease in internal consistency reliability (Ashton & Lee, 2009).

When scoring this shorter version the facet scale scores are computed as means across all items in the facet, after the recoding of the reverse-keyed items. One thing to keep in mind is that because of the shortened nature of these scales, the facet scales of both the 60- and 100-item versions of the HEXACO-PI-R are not intended to have as high levels of internal consistency reliability as the longer versions of the HEXACO-PI-R. These facets are recommended for use only as indicators of the HEXACO personality factors and indicators of conceptually connected criterion variables.

Hypothesis and Implications

Because of the anonymity provided by the internet and the character creation possibilities of MMORPGs, it is now possible to create a whole new persona within these virtual worlds. This persona can act, talk and appear different from the real life self and because of this distinction, a new 'online' or 'digital' self emerges, offerin people the chance to create a new version of the self. Furthermore computer-mediated communication makes it easier to hide the actual self and 'fake' this new version of the self. Given these circumstances, self-presentation is more flexible in the virtual world, and so the main hypothesis of this research is that *there is a difference in the self when comparing real-life situations to situations that occur in MMORPGs.*

When looking at this hypothesis in conjunction with the theories that people possess multiple versions of the self, some interesting things come to light. On one hand,

it could be reasoned that the player has created, what is in his mind, the perfect or ideal character, meaning that the character is a reflection of the ideal self. On the other hand it could be argued that the online self substitutes for the actual self and can thus be used to reduce emotional turmoil by bringing the online self closer to the ideal self. The first two options refer in this way to Higgins' self-discrepancy theory. A third option is that this change has caused Roger's true self or Goffman and Jung's inner self to blossom and to reveal itself. Finally, it could be that this change has nothing to do with any of the previously mentioned theories of the self, but that there is a whole new kind of self emerging. This brings up the fact that it is hard to determine what exactly will change within people once they start playing MMORPGs. Given that there has been no previous research conducted into these differences, no hypotheses are put forth as to what exactly will change. Rather the following research question is asked: *How do the personality factors change when comparing real-life situations to situations that occur in MMORPGs?*

The practical applications can be considered varied as research of this kind could be used to further improving these virtual worlds, as well as possibly being helpful in quickly identifying real world dysfunctions through the analysis of in-game behaviour. The value of this kind of quick and large-scale probing for clinical application is obvious, as it can often be time consuming and expensive to find maladaptive individuals by other means. The main hypothesis and research question both share the purpose of understanding how virtual communities and real communities interact with each other and how a change in a variable that is measure offline can possibly lead to a change that is measured online. This ties nicely with the theoretical implications of this study as they can perhaps best be described as advances in understanding virtual communities and their relations to the real world.

Method

Sampling and Participants

The sample was a convenience sample based on the players who visit the forums of *EVE Online* during the time period of the data collection. Data collection was planned to span 2-3 weeks or continue till such a time when 300 (or more) participants had responded. The survey was set up on the *EVE Online* forums where players could choose to respond to the survey. The number of participants that started to respond were 876, but 355 were excluded due to missing data, and thus the sample analysed consisted of 521 participants who completed the survey, with what was judged to be a sufficient number of data points. Of these, 94.6% were male (N = 493) respondents and 5.4% female (N = 28). Their age ranged from 13 to 58 with the mean 29.56 (SD = 9.48) and a median of 28. The 355 participants excluded were those that started the survey, but did not complete it along with those who had too much missing data. Missing data was defined as one or more missing answer in any particular HEXACO domain. Those who had one or more missing answer in particular domains were excluded from the analysis for that domain, although their answers were not removed altogether. Only those who did not complete the survey were removed altogether. The selection process was not restricted in any way, although visiting the *EVE Online* forums is not a necessary part of playing *EVE Online*. This can be considered a restriction of the population because there is no data that implies that the players who visit the forums are really representative of the general player population. However, according to information obtained from *CCP*, the participants were found to be representative of the general player base of *EVE Online* regarding both age and gender distribution. No payment of any kind was offered for participating and all participants answered the same survey.

Design and Materials

This research project was run using English, as that is the language of *EVE Online*, which has an international player base. To administer the survey, both the self-report form and the observer report form of the HEXACO-PI-R were used in their shortened 60-item version and converted for online use. The online version split each report form into three sections of 20 statements to facilitate responding and thus willingness to participate. All 60 HEXACO statements were answered with a five point scale ranging from "strongly disagree" to "strongly agree" with a "neutral" option in the middle. These 60 questions were responded to twice, once for the self-report and once for the observer report. The psychometric qualities of the HEXACO-60 can be seen in the HEXACO chapter of the introduction. Along with the HEXACO-PI-R, the researchers constructed an additional list of 16 statements (see Appendix A) which contained several general statements concerning on- and offline behaviour and was also answered with the same format five point scale. As seen in Appendix A these questions address a myriad of subjects that the researchers thought could be correlated and analysed in conjunction with the HEXACO inventory questions. Participants were also asked for their age, gender and hours played per week (see Appendix G). Thus, each respondent who completed the questionnaire responded to 139 questions. The survey was conducted using *LimeSurvey*.

Procedure

The survey was set up online and activated. Originally, it was the intention of the researchers to randomize whether subjects answered the self-report or the observer report forms first in an attempt to minimize systematic errors. However, *LimeSurvey* did not provide this option and it was therefore decided to ask participants to answer the self-report form first and the observer report form subsequently. A link was provided to

CCP and they publicized and endorsed the questionnaire through the official forum to increase the credibility of the survey towards players. As the survey was administered online, there was minimal control over environmental factors affecting the participants. The only control the researchers had over the situation was that all the participants received the same instructions including a standard anonymity clause (see Appendix B). A short explanation of the research agenda was also provided (see Appendix C) and information on who was conducting the experiment. On each page there was also a short instruction text pertaining to the report from being answered at that time. There were specific instructions for the self-report form (See Appendix D), observer report form (See Appendix E), as well as for the miscellaneous questions (See Appendix F). During pre-testing (with 12 participants, not included in the final sample) both report forms were timed and took just under 20 minutes total to complete. This timeframe was deemed acceptable for research purposes. Along with timing the survey, minor adjustments to instructions and setup were made after reviewing comments from participants. Compliance was expected to be somewhat reduced from standard pen-and-paper norms because of the lack of researcher pressure on-site since the survey was conducted online. The survey was set up using standard equipment and no custom materials were used.

Results

Data examination revealed that all personality traits, both for self-report and observer report forms, have quite varied distributions ranging from positive to negative skewedness. Yet, none of them has any prominent outliers which are considered to have a significant impact on the mean, although there are a few who fall outside the whiskers of their boxplot. Since t-tests are quite robust against skewedness and can deal with a few outliers when working with samples as big as in this study, it was decided that it is appropriate to use these parametric tests under these circumstances.

A correlation matrix for the self-report form is reported in table 1 and for the observer report form in table 2. Cronbach's alpha for each personality factor is also presented in both tables. The correlations in both tables are shown as Pearson's *r* coefficients and their strength is interpreted according to estimates set forth by Quinnipiac University (2000). The reliability is presented with Cronbach's alpha and is interpreted according to estimates from George and Mallery (2003).

Table 1. Correlation matrix for the self-report form with Cronbach's alpha listed in bold

	1	2	3	4	5	6
1. Honesty-Humility	**.769**					
2. Emotionality	.033	**.710**				
3. Extraversion	-.128[**]	-.175[**]	**.835**			
4. Agreeableness	.281[**]	-.055	.064	**.764**		
5. Conscientiousness	.199[**]	-.110[*]	.145[**]	-.068	**.780**	
6. Openness to Experience	.119[**]	-.009	.155[**]	-.033	.214[**]	**.794**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

As can be seen in table 1, the correlations between the personality factors are all negligible, indicating high discriminant validity between the constructs of the personality test. The only exception is between agreeableness and honesty-humility, and conscientiousness and openness to experience, where the correlation is positive but weak

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in both cases. It's evaluated to be weak enough to indicate a divergence between said personality factors and therefore has a minimal impact on the discriminant validity. The reliability of the personality tests ranges from acceptable to good, depending on which personality factor is being examined. Based on these results, the self-report form is evaluated to be a significant tool for measuring identity in the real world.

Table 2. Correlation matrix for the observer report form with Cronbach's alpha listed in bold

	1	2	3	4	5	6
1. Honesty-Humility	**.802**					
2. Emotionality	.196[**]	**.770**				
3. Extraversion	-.230[**]	-.204[**]	**.779**			
4. Agreeableness	.358[**]	.115[*]	-.075	**.811**		
5. Conscientiousness	.106[*]	-.060	-.036	-.052	**.815**	
6. Openness to Experience	.092[*]	.114[*]	.133[**]	.097[*]	.184[**]	**.772**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The same goes for the observer report in most cases. From table 2 one can see that the correlations are mostly negligible, except on three occasions. Extraversion is negatively correlated with both Honesty-Humility and Emotionality, but the relationship is in both cases very weak. A bigger problem, however, is the connection between Agreeableness and Honesty-Humility where the correlation is 0.358. This is a moderate relationship that is approaching strong, which means that one has to be careful when interpreting the results regarding these personality factors. A high correlation between these personality factors is known, however, as it has also been established by other researchers (Ashton et al., 2006; Ragnarsson, 2011). Therefore, the discriminant validity for the observer report form is deemed acceptable. The reliability of the personality tests ranges from acceptable to good in the observer report form, depending on which personality factor is being examined. Based on these results, the observer report form is evaluated to be a significant tool for measuring identity in the virtual world.

Personality Differences

Imported values regarding the differences between the self-report form and the observer

report form are listed in table 3. First of all, an important matter needs to be addressed.

While the mean indicates the directly calculated difference between the self-report and

the observer report, it still is a point estimate which is a highly uncertain predictor.

However, the lower marginal value of the confidence interval indicates what the mean

difference should be at least with 95% certainty and is therefore a much safer estimate.

From here on out then, when the difference between the two report forms is mentioned,

it's the lower marginal value of the confidence interval that's being cited. Cohen's d for

each difference and the scores for each report form are, along with the lower marginal

value of the confidence interval, the main values that will be interpreted from table 3.

All differences are significant at $\alpha = 0.05$, calculated with a paired t-test.

Table 3. The mean scores for both the self-report form and the observer report form along with the difference between them, 95% confidence interval of the difference, t-tests and Cohen's d

	Self-report	O. report	Difference	95% Conf.		Paired t-test		
	M (SD)	M (SD)	M** (SD)	Lo	Up	t	p	d*
Honesty-Humility	3.40 (.72)	2.79 (.87)	-.61 (.81)	.53	.68	16.36[a]	.00	.75
Emotionality	2.61 (.61)	2.06 (.65)	-.55 (.66)	.49	.61	17.91[b]	.00	.83
Extraversion	3.10 (.73)	3.42 (.67)	+.32 (.74)	.26	.39	9.54[c]	.00	.44
Agreeableness	3.00 (.66)	2.84 (.75)	-.16 (.73)	.10	.23	4.79[d]	.00	.22
Conscientiousness	3.45 (.63)	3.53 (.72)	+.08 (.71)	.02	.15	2.55[e]	.01	.12
Openness to Experience	3.76 (.66)	3.31 (.73)	-.45 (.69)	.39	.51	14.11[f]	.00	.65

a. df = 473 ($N_{excl.}$ = 47); b. df = 468 ($N_{excl.}$ = 52); c. df = 470 ($N_{excl.}$ = 50); d. df = 463 (Nexcl. = 57); e. df = 471 (Nexcl. = 49); f. df = 469 (Nexcl. = 51); *. Cohen's d for the difference.
**. + equals an increase in difference; - equals a decrease in difference.
$N_{excl.}$ stands for the number of participants excluded.

The mean score for all six personality factors for both the self-report form and the

observer report form are shown graphically in figure 1. The difference between these

two report forms is shown graphically in figure 2. When analysing calculations for

Cohen's d, people show obvious differences on two personality factors between the self-

report and the observer report. The most obvious one is the Emotionality factor where

Cohen's d is 0.83, while the other factor is the Honesty-Humility factor with a Cohen's d of 0.75. The differences between virtual world identity and real life identity are also the biggest for these two factors. With a drop of at least 0.53 points on the Humility-Honesty factor, people show less honesty and humility inside MMORPGs. The same reduction inside MMORPGs goes for emotionality as the score drops at least 0.49 points.

The Openness to Experience factor has a quite obvious difference as well, with a Cohen's d of 0.65. In accordance with the previous two factors, the difference here is also a reduction between the scores of the two report forms, with a drop of at least 0.39 points. This means that once people are playing MMORPGs, they are not as open to experience as in the real world. The last factor to show a visible difference is the Extraversion factor with a Cohen's d of 0.44, stating that this visible difference is still only moderate. In contradiction to all previous factors, extraversion actually increases between the two report forms, with a rise of at least 0.26 points. People therefore become more extraverted when they are playing MMORPGs than they are in the real world.

The last two personality factors, Agreeableness and Conscientiousness, both show little difference between the scores for the two report forms. These differences are also not easily identified, as Cohen's d is only 0.22 for agreeableness and 0.12 for conscientiousness. Agreeableness makes a drop of at least 0.10 points between the forms, indicating that people are not as agreeable inside MMORPGs as they are in the real world. Conscientiousness, on the other hand, increases by at least 0.02 points between the forms, indicating that people act more conscientiously once they are playing MMORPGs. One must keep in mind, though, that these differences are small and must therefore be interpreted with caution.
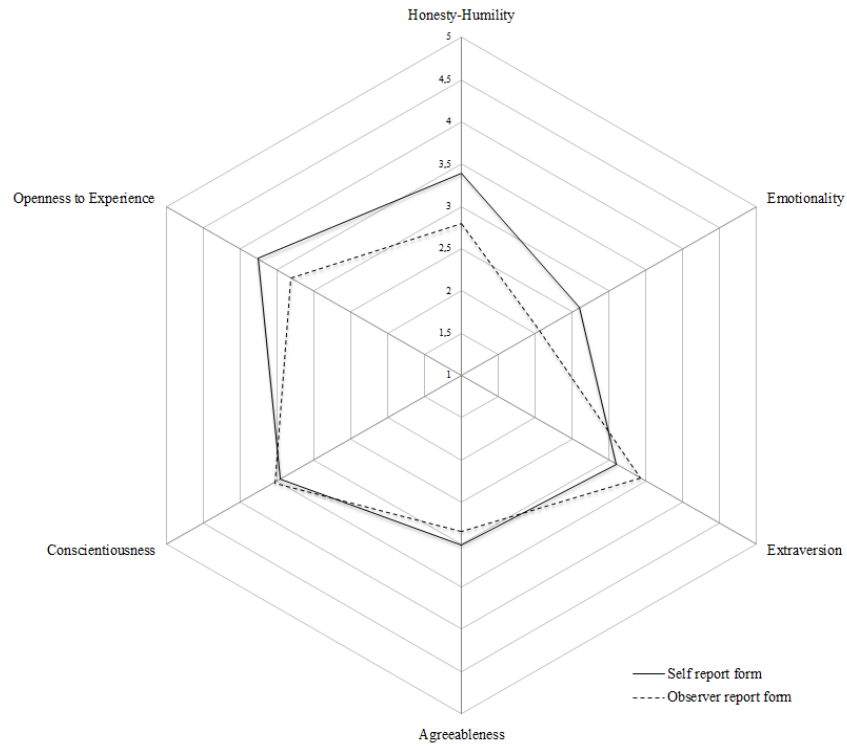
Figure 1. A radar graph including the mean score for all six personality factors for both the self-report form and the observer report form.
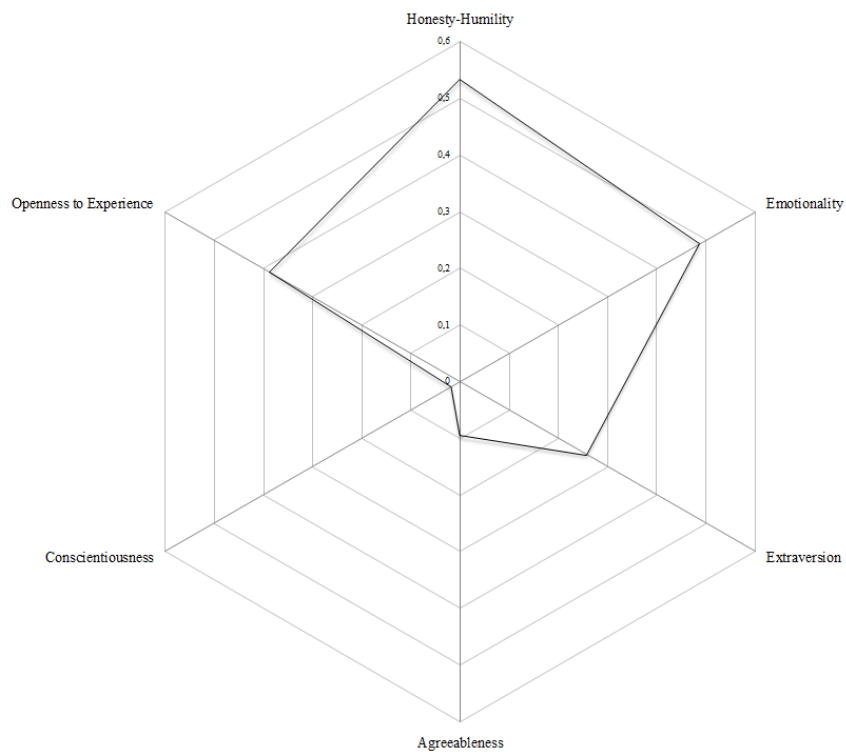

Figure 2. A radar graph including the lower marginal value of the 95% confidence interval for the mean difference of all six personality factors between the two report forms.

Miscellaneous Questions

At the end of the survey, participants were asked to answer 16 miscellaneous statements regarding comparison between in-game and real life conditions. The response distribution for them can be found in table 6 (Appendix H). These statements have all been put into a correlation matrix along with the personality factors of both the self-report form and the observer report form. This is done to identify any possible connections between the statements and personality factors. The three highest scoring correlations for each statement are reported in table 4.

Only two of the 16 statements had a strong correlation to a personality factor. Statement number 16 had a strong positive correlation of $r = 0.417$ with the Extraversion factor of the self-report form, indicating that the more extraverted a person is in real life, the more he feels that he is doing as well in his life as he had hoped. Statement number 13 also had a strong correlation with the Extraversion factor of the self-report form, only this time it was negative with $r = -0.403$. This means that the less extraverted a person is in real life, the more he feels "at home" in-game than in real life.

Five other statements had moderate correlations to a personality factor. Two of these statements, number 9 ($r = -0.354$) and 11 ($r = -0.381$), had a correlation with the Extraversion factor of the self-report form as well, both being negative. This means that the less extraverted a person is in real life, the more comfortable he feels talking to the opposite sex in-game than in real life, and the more he will like his in-game character better than his real-life self. Two statements, number 5 ($r = -0.347$) and 7 ($r = -0.317$), had a negative correlation with the Emotionality factor of the observer report form, indicating that the less emotionality a person shows inside an MMORPG, the more financial risks he takes in-game than in real-life, and the more he feels like he has less to lose. The last statement is number 1, which has a positive correlation to the Extraversion

factor of the observer report with r = 0.317. This indicates that the more extraverted a person is inside a MMORPG, the more knowledge people he plays with on a regular basis in-game have of his personal life.

Table 4: Miscellaneous questions with the three highest correlated personality factors

		Highest correlation		Second highest correlation		Third highest correlation	
		Factor	r	Factor	r	Factor	r
1.	The people I play with on a regular basis in-game have knowledge of my personal life.	OR.X	.317	SR.X	.169	SR.H	-.080
2.	I behave differently towards my in-game friends than I do towards my real-life friends.	OR.H	-.252	SR.H	-.216	SR.C	-.187
3.	I think there is a difference between my real-life and my in-game behaviour.	OR.H	-.263	OR.A	-.252	OR.E	-.160
4.	The people I play with on a regular basis in-game know what I look like in real-life.	OR.X	.263	SR.X	.234	SR.H	-.154
5.	I take more financial risks in-game than in real-life.	OR.E	-.347	OR.H	-.286	OR.X	.205
6.	I tend to help people more in real-life than in-game.	OR.H	-.170	SR.O	.112	SR.X	.103
7.	I feel like I have less to lose in-game than in real-life	OR.E	-.317	SR.O	.181	OR.X	.121
8.	I feel that I have more friends in real-life than in-game.	SR.X	.280	SR.O	.131	OR.E	-.128
9.	I feel more comfortable talking to the opposite sex in-game than in real life.	SR.X	-.354	SR.O	-.129	SR.E	.104
10.	I have met the people who I got to know through the game in person outside the game.	SR.X	.279	OR.X	.203	SR.H	-.093
11.	I like my in-game character better than my real-life self.	SR.X	-.381	SR.C	-.202	SR.E	.132
12.	My real-life friends would like my in-game character more than my real-life self.	SR.X	-.256	OR.X	.239	OR.H	.153
13.	I feel more "at home" in-game than in real-life.	SR.X	-.403	SR.C	-.162	SR.O	-.162
14.	I am more assertive in real-life than in in-game.	SR.X	.262	SR.O	.106	OR.O	.099
15.	I feel that I am doing as well in EVE Online as I had hoped.	OR.X	.290	OR.E	-.147	SR.X	.113
16.	I feel that I am doing as well in my life as I had hoped.	SR.X	.417	SR.C	.153	OR.X	.140

SR – Self-Report; OR – Observer Report; H – Honesty-Humility; E – Emotionality;
X – Extraversion; A – Agreeableness; C – Conscientiousness; O – Openness to Experience.

The rest of the statements all had weak or lower correlations with a personality factor and are therefore not interpreted further.

Notable Findings

One notable finding is revealed, when 79 individuals are isolated with the most extreme differences on both the Honesty-Humility and Emotionality factors and analysed further. Extreme differences are defined as a greater difference than the upper marginal value of the confidence interval on both factors shown in table 3. Comparing these individuals with the rest of the sample in conjunction with the miscellaneous questions causes three of the questions to stand out and form a notable unity. Neither age (t = 0.33, p = 0.74) nor playtime (t = 1.01, p = 0.31) has any significant impact on the fact that someone would be considered an extreme individual under these conditions. Imported values associated with this unity are listed in table 5.

Table 5. The mean scores for both the self-report form and the observer report form along with the difference between them, 95% confidence interval of the difference, t-tests and Cohen's d.

	Sample	Extreme	Difference	95% Conf.		Ind. t-test		
	M (SD)	M (SD)	M** (SD)	Lo	Up	t	p	d*
Statement 3	3.40 (1.22)	4.15 (0.98)	+.75 (1.29)	.46	1.04	5.15[a]	.00	.58
Statement 12	2.26 (1.07)	1.86 (0.97)	-.40 (1.15)	.15	.66	3.12[b]	.00	.35
Statement 15	3.29 (1.12)	3.63 (1.12)	+.34 (1.21)	.07	.61	2.47[c]	.01	.28

3. I think there is a difference between my real-life and my in-game behavior.
12. My real-life friends would like my in-game character more than my real-life self.
15. I feel that I am doing as well in EVE Online as I had hoped.

Cohen's d for these statements is not high. Only statement 3 has a visible difference with a Cohen's d of 0.58. Statement 12 and 15 both have a difference that is not easily identified, where statement 12 has a Cohen's d of 0.35 and statement 15 a Cohen's d of 0.28. Yet, it's not each statement on its own that's worth taking a look at, but their unity. Statement 3 has an increase in the score of at least 0.46, indicating that these extreme individuals are more aware that there is a difference between their

behaviour in MMORPGs and in the real world. A decrease of at least 0.15 in the score of Statement 12 indicates that these individuals are also suggesting that their in-game behaviour would be less likable in the real world than the rest of the sample. Yet, with an increase of at least 0.02 in the score of Statement 15, these individuals also claim to be doing better in *EVE Online* than the rest of the sample. This unity will be further analysed in the discussion.

Discussion

After analysing the results, it is clear that there is a difference in personality between measurements within MMORPGs and outside them. This means that the main research question set forth at the start of the study has been answered positively. Building on the relation between personality and the self, explained in the theoretical section of this thesis, it can be said that this difference extends to the self as well. As pointed out in the results, this means that the research hypothesis was supported by the results. There is a difference in the self when comparing real-life situations to situations that occur in MMORPGs.

Performing a post hoc analysis to try to find where this difference in personality might lay causes some very interesting things to come to light. A significant difference is present in all factors, with some domains changing more than others, but the difference is most pronounced in four domains. When looking at the results as a whole, an interesting transformation of personality becomes apparent. Certain attributes seem to change consistently as individuals assume the role of their character.

In the Honesty-Humility domain, the scores decrease considerably in the observer report. As recalled from the introduction, people with high scores in this factor generally follow the rules, are not interested in excessive wealth or luxuries and do not strive for elevated social status. A large part of the game revolves around corporations, which involve both wealth and social status. It's therefore profitable to have low scores on this scale within the game, because it indicates attributes that can help players gain more wealth and get to the top within corporations. Anonymity, along with the lack of rules against this kind of behaviour, affords people the chance to cheat others without serious repercussions. Perhaps that people are therefore more likely to manipulate others, break the rules and are more materialistic within the game.

Scores are also noticeably lower in the Emotionality domain, suggesting that fear and anxiety are lessened within the game. Many things that are considered emotional in the real world are not as serious in the virtual community. Death, for example, is not permanent within the game, and is therefore not as emotional as in the real world. Another example is that fighting in game does not cause physical harm, meaning that people should not fear combat as much as in real life. Stressors should therefore be less prominent within the game. Analysis of two statements in the Miscellaneous Questions offers some explanation to this drop as well, as they indicate that with less emotionality, people are more likely to take financial risks and feel that they have less to lose within the game. Over 80% of all players also agree with both these statements. Because people feel like they have less to lose, failure is not as big of an obstacle. Therefore, people with lower emotionality do perhaps have an advantage, as they are more willing to take risks that could be profitable in the future.

The results concerning the Openness to Experience domain are considered quite surprising as this domain was expected to receive higher scores in-game. This is in fact not the case, as scores on this domain are actually higher on the self-report. This domain has the closest ties with attributes connected to exploration and inquisitiveness, along with appreciation of art, which is abundant in the visually stimulating nebulas of *EVE Online*. There are many new places to be explored and things to be seen which people do not have to opportunity to see in real life. An increase in this domain was therefore expected when people play MMORPGs, and not a decrease, as is evident. This decrease may indicate that people are perhaps more focused on progression within the game rather than the visual aspects.

An increase does, however, appear in the Extraversion domain, although the difference is not as obvious as with the previous factors. Higher scores on this domain

refer to characteristics like enjoying social gatherings and interactions, confidence when addressing or leading people and general feelings of positive enthusiasm. This difference could be due to factors such as increased confidence while interacting through avatars, and decreased anxiety brought forth by real world face-to-face interaction or scenarios where physical appearance plays a bigger role. Anonymity should also be a factor here, because if conversations get awkward or go wrong, these 'failures' have no influence in their real life. This should cause people to be more willing to socialize within MMORPGs. Extraversion does not seem to show any direct advantages, but appears to serve more as an indicator of what type of people will find the most 'comfort' within the game. The lower people score on the extraversion scale on the self-report form, the more "at home" they will feel within the game, the more likely they are to like their in-game character more than their real-life self, and the more comfortable they will feel when talking to the opposite sex within the game. They are also less likely to do as well as they had hoped for in their real life. This could indicate that people who are less extroverted in real life play MMORPGs to fulfil their needs. MMORPGs could therefore provide people with a new opportunity to achieve their goals and success.

The differences in the Conscientiousness domain and the Agreeableness domain are negligible compared to the other four factors. While still significant, there are no easily identifiable differences in behaviour between the virtual world and the real world, and they are therefore not interpreted any further.

The main question that arises when these results have been presented is what causes this change. Does this change happen without people noticing or could it be that people actually change themselves on purpose? When analysing the most extreme individuals, those who changed the most, they all claim to do better in *EVE Online* then the rest of the sample. They also agree more to the statement that there is a difference

between their real life and their in-game behaviour. The most interesting bit, however, is that they all state that their character is less likeable in real life then the rest of the sample. This indicates that in order to do well within the game, people have to show lower scores on the Honesty-Humility and the Emotionality domains, resulting in characters that are less likeable. Those who do well within the game realise this fact and exploit it to their advantage. The Mittani, quoted in the introduction, mentioned this as he said that it provided him with an in-game advantage to act like a villain. These findings seem to indicate that people actually do realise that they change, but more interestingly, they do this deliberately, with the sole purpose of doing better in the game.

All this indicates that the self goes through some changes once people have logged into a virtual world. Yet, there is nothing that shows directly what kind of self emerges. People seem to change themselves because it offers them an advantage within the game. Virtual worlds come with a different set of rules and a new form of communication, so people have to adapt to these new settings. This can be likened to Darwin's theory of evolution, where only the fittest survive, so people find out what traits are profitable within the game and use them to their advantage. In this case, the self that emerges within the game could be related to the ought self, described in Higgins' self-discrepancy theory. While people do not behave exactly as society expects them to, like described in the theory, they still behave in ways they expect to be beneficial within this online society. It's important to note, however, that the self that emerges within MMORPGs is most likely a new kind of self that old theories do not encompass entirely, although reminiscent of Higgins' ought self.

These results have several implications, theoretical as well as practical. The main practical implication concerns the connection between online and offline behaviour. The information provided by this thesis suggests that there is a way to examine behaviour

within MMORPGs and use this information to predict real life behaviour. The so called 'safe' environment provided by these games could in this way be used for a myriad of purposes ranging from identifying suitable real life leaders to creating scenarios to examine how people would react in real life situations. This is in reference to the virus epidemic within *World of Warcraft*, mentioned in the introduction, where an online phenomenon was thought to be suitable for real life research. The theoretical implications are mostly pertinent when discussing theories of the self. As mentioned earlier, the self seems to go through changes when crossing the online-offline barrier. It is however not clear how exactly this change occurs or if it changes at all, although the researchers believe this to be the case.

Despite attempts made by the researchers to minimize systematic errors and biases, there are some flaws that must be taken into account. First of all, the survey-order could not be randomized as software restrictions made this impossible. Therefore, after some deliberation, it was decided to present the self-report form first. This is in part due to the so called carryover effect which refers to the effect that, when taking two tests simultaneously, the 'effects' of one of them might carry over to the next test (for example fatigue or getting better at answering test questions). It was therefore estimated that by administering the self-report form first these effect would be minimized. This was partly because the self-report form was more self-explanatory and thus it was logical to administer this first to let players get a hang of the process. A possible sampling bias is perhaps present due to the fact that the survey was administered on the *EVE Online* forums which are located on the game's website. Visiting these forums is not an integral part of playing *EVE Online* although many players visit these forums regularly. It is quite possible that those who play more (i.e. hardcore players) are more likely to visit those forums and this might skew the results somewhat. This "hardcore

bias" is probably exclusive to the field of gaming research, and therefore especially relevant. This bias was described by *CCP* as the tendency of those who play more to be more likely to answer the survey. This is possibly due to the fact that they are more invested in the development of the game and therefore more likely to contribute to research that is likely to spur this development.

Along with biases, there are other things that must be considered regarding the survey process. First of all, it's important to reflect on the method by which this data was gathered. As far as the researchers are aware of this method of examining these differences has never been used before. The method of comparing two different measurements from the same individual requires a lot of cooperation from the participants and assumes that they have a clear understanding of what they are supposed to do in order to properly answer the survey. This is particularly difficult because of the lack of researcher help and pressure that is missing when administering surveys online. The instructions had therefore to be even clearer than usual. During pre-testing there were a few hitches with the method of administering two questionnaires. This was partly because some participants thought that they had to role-play (engage in deep character immersion) to be able to properly answer the observer report form. They assumed that this is what the researchers intended to examine and were quick to point out that only a minority of players did, in fact, role-play. Therefore, a clause in the observer report form instructions was included (Appendix E), explaining that the intention was not for participants to 'play out' the scenarios, but rather estimate how they would assess these situations if they were to occur while they were playing. Despite this adjustment to the instructions, it is entirely possible that some participants still assumed role-play was somehow involved. Fortunately, this should not harm the results because the difference between MMORPG behaviour and real life behaviour should indeed show even if the

survey were answered in this mind-set. These adjustments were merely added to encompass those who did *not* role-play, as they would otherwise be unable or unwilling to participate. Many of these biases or shortcomings are the by-product of this previously untested method. However, these results still provide an interesting insight into the changes that occur as people log into MMORPGs and there is at this point no reason to assume that these results are flawed.

While the study was done with a sample of *EVE Online* players, there is no evidence that suggests that these results cannot be projected onto other MMORPGS. Other games, while being set in different worlds, possess many of the same elements found in *EVE Online*. The results displayed here could therefore well be transferred to similar scenarios within other games.

Looking at the differences from the perspective of the 'self theories', rather than just researching personality factors by themselves, affords a much wider and expansive analysis of the data. A part of this lies in the opportunity to assess if there really are multiple selves within an individual and if a new self could be formed within a virtual world. Visiting these theories affords the implication of concepts such as the *true self*, as mentioned in the introduction. There it was said that "people thus pursue their true self so they can express themselves more freely, which in turn will give them a feeling of satisfaction" and the consequence-free environment of *EVE Online* might just be the perfect venue for experiments of such ideas of the self. Another possible link to theories about the self is that playing MMORPGs could be used to 'act out' the *ideal self*. In the game, an individual really has the chance to portray the perfect version of him- or herself. This could be researched further with the group that said that their real life friends would like their character better than their real life selves. This may be partly because they know what attributes are considered desirable, and have created a self that encompasses

all those attributes leading them to create a self that they think their friends would like better. This conflicts in some ways with the statements set forth before that suggested that people would act in a manner that was beneficial to in-game progress. These two theories can, however, coexist as these two could refer to completely different groups of people within the game. Hopefully, this idea about the ideal self is not true for those who act like villains inside the game, because their ideal self would most likely be considered immoral in real life. However, this cannot be ruled out.

Despite all these theories regarding the self, many questions remain unanswered. The reason a difference in the self appears, for example, is still not fully explained. Although this research points to the fact that people change their self on purpose as a form of adaptation, other possible explanations cannot be ruled out completely. Perhaps people change because the different framework of MMORPGs affords them more freedom over their actions, and with this lack of restrictions, people are free to act as they please. Another explanation might be that people are using this opportunity to experiment with their self-presentation in an environment where anonymity affords them a 'blank slate'. This blank slate is the by-product of CMC, referring to the fact that because players can't see each other's faces, there are certain verbal and physical cues missing from the communication that occurs online. This does, as mentioned in the introduction, limit the amount of information that can be relayed, whereas factors such as sarcasm and facial expressions can't be communicated properly. This 'blank slate' is a concept closely related to a concept in CMC terminology called the 'participation-equalisation effect', which suggests that because of anonymity, "everyone in online games is born equal". Goffman also mentioned that people possess a front- and backstage. It doesn't matter what persona is on the front stage, physical and verbal cues can give away what is really happening on the backstage, making it hard to 'fake' a

persona. These cues, however, are not present with CMC, making it near impossible for people to identify what is happening on the backstage. It's therefore easier to fake a persona in a virtual world than in a real one. People may not be changing their self because it has an advantage, but they are rather changing their self because they find it interesting to know what it is to be like someone else.

There are many ways to delve deeper into this subject in order to explore this difference in personality further. An interesting follow up study would be to go deeper into these differences to research where exactly they lie. One of the key points in this future research is the confident operationalization of in-game behaviour as a measurement tool. If one were to succeed in this, it would mean that the in-game data stored by the game servers could be used to measure and assess behaviour. An example of this would be defining certain acts of hostility as indicators of an 'aggressive personality'. If a player were to attack another player, this would be labelled as a hostile act. Because this player interaction is logged by the game servers, this aggression could be assessed quite easily by comparing numbers of 'hostile encounters' between players. This is one of the many things that psychological research in this field could benefit from, as this data is readily available and only needs to be properly harnessed.

All in all, there are many interesting things that come to the surface when researching this subject and many more probably remain unseen. The results analysed here above, while obtained with untested methods, shed a light on the complex interaction of personality and the self that clearly exists between the real world and MMORPGs. All this merely works to emphasize the fact that although virtual, space really is the final frontier.

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Appendices

Appendix A: Miscellaneous questions set forth by researchers.

1. The people I play with on a regular basis in-game have knowledge of my personal life.

2. I behave differently towards my in-game friends than I do towards my real-life friends.

3. I think there is a difference between my real-life and my in-game behaviour.

4. The people I play with on a regular basis in-game know what I look like in real-life.

5. I take more financial risks in-game than in real-life.

6. I tend to help people more in real-life than in-game.

7. I feel like I have less to lose in-game than in real-life.

8. I feel that I have more friends in real-life than in-game.

9. I feel more comfortable talking to the opposite sex in-game than in real life.

10. I have met the people who I got to know through the game in person outside the game.

11. I like my in-game character better than my real-life self.

12. My real-life friends would like my in-game character more than my real-life self.

13. I feel more "at home" in-game than in real-life.

14. I am more assertive in real-life than in in-game.

15. I feel that I am doing as well in EVE Online as I had hoped.

16. I feel that I am doing as well in my life as I had hoped.

Appendix B: Anonymity clause

A note on privacy. [title]

This survey is anonymous. The record kept of your survey responses does not contain any identifying information about you unless a specific question in the survey has asked for this. If you have responded to a survey that used an identifying token to allow you to access the survey, you can rest assured that the identifying token is not kept with your responses. It is managed in a separate database, and will only be updated to indicate that you have (or haven't) completed this survey. There is no way of matching identification tokens with survey responses in this survey.

Appendix C: General instructions for the survey

Personality differences in MMORPGs [title]

CCP and The University of Iceland

Thank you for agreeing to participate in this survey. It is administered on behalf of two students at the psychology department at the University of Iceland. Its goal is to estimate differences in personality between your real-life self and in-game character. Your participation is a valuable contribution to further research into MMORPGs and may impact further development of EVE Online.

The survey consists of three separate lists of statements. The first list is a self-report form where you will find a series of statements about yourself in real-life. The second list is an observer report form where you will find a series of statements about your in-game character. The third list contains several general statements concerning on- and offline behaviour. Please read the instructions on each page carefully as they will change between lists and contain detailed information how each report functions.

Each statement on all lists will contain a 5 point scale as shown below:

5 = strongly agree

4 = agree

3 = neutral (neither agree nor disagree)

2 = disagree

1 = strongly disagree

The survey should take about 20 minutes to complete and we ask you to answer each statement to the best of your knowledge.

There are 139 questions in this survey.

Appendix D: Self-report section instructions

These statements are about your real-life self and concern your life outside the game. Please read each statement and decide how much you agree or disagree with that statement. You may choose to stop responding at any time, or to skip any questions that you do not want to answer. We do however encourage you to answer every statement, even if you are not completely sure of your response. There are no right or wrong answers. Each statement will contain a 5 point scale as shown below:

5 = strongly agree

4 = agree

3 = neutral (neither agree nor disagree)

2 = disagree

1 = strongly disagree

Appendix E: Observer report section instructions

These statements are about your in-game character and are presented in third person. Select your main character and answer as if your character were a different person than yourself. Try to capture his/her views, attitudes and behaviours in your responses. Note that we are not inquiring about role-playing habits but rather how you think you would react as your character in these situations in-game. Please read each statement and decide how much you agree or disagree with that statement. You may choose to stop responding at any time, or to skip any questions that you do not want to answer. We do however encourage you to answer every statement, even if you are not completely sure of your response. There are no right or wrong answers. Each statement will contain a 5 point scale as shown below:

5 = strongly agree

4 = agree

3 = neutral (neither agree nor disagree)

 2 = disagree

1 = strongly disagree

Appendix F: Instructions for miscellaneous questions

This list contains several general statements concerning on- and offline behaviour. Please read each statement and decide how much you agree or disagree with that statement. You may choose to stop responding at any time, or to skip any questions that you do not want to answer. We do however encourage you to answer every statement, even if you are not completely sure of your response. There are no right or wrong answers. Each statement will contain a 5 point scale as shown below:

5 = strongly agree

4 = agree

3 = neutral (neither agree nor disagree)

2 = disagree

1 = strongly disagree

Appendix G: General information

1: *Gender:

◻ Female ◻ Male

2: *Age:

|_____|

Only numbers may be entered in this field

3: *How many hours do you play on average per week?

|_____|

Only numbers may be entered in this field

Appendix H: Response distribution for the miscellaneous questions

Table 6. Response distribution for the miscellaneous questions

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N*
1.	The people I play with on a regular basis in-game have knowledge of my personal life.	16.8%	21.6%	12.5%	36.4%	12.7%	519
2.	I behave differently towards my in-game friends than I do towards my real-life friends.	19.8%	34.5%	14.3%	22.5%	8.9%	519
3.	I think there is a difference between my real-life and my in-game behaviour.	6.9%	18.1%	14.3%	37.8%	22.9%	519
4.	The people I play with on a regular basis in-game know what I look like in real-life.	35.1%	22.4%	11.2%	18.8%	12.5%	518
5.	I take more financial risks in-game than in real-life.	3.7%	8.5%	7.3%	27.1%	53.4%	517
6.	I tend to help people more in real-life than in-game.	13.5%	31.3%	27.5%	17.6%	10.1%	517
7.	I feel like I have less to lose in-game than in real-life	3.3%	7.7%	7.2%	27.8%	54.0%	517
8.	I feel that I have more friends in real-life than in-game.	10.8%	15.4%	20.3%	26.9%	26.6%	518
9.	I feel more comfortable talking to the opposite sex in-game than in real life.	23.9%	25.5%	27.4%	14.5%	8.7%	518
10.	I have met the people who I got to know through the game in person outside the game.	39.2%	21.2%	11.0%	18.4%	10.2%	518
11.	I like my in-game character better than my real-life self.	29.3%	23.5%	24.1%	15.0%	8.1%	519
12.	My real-life friends would like my in-game character more than my real-life self.	32.1%	28.8%	29.0%	6.8%	3.3%	517
13.	I feel more "at home" in-game than in real-life.	25.0%	29.0%	21.7%	16.0%	8.3%	515
14.	I am more assertive in real-life than in in-game.	8.7%	30.2%	33.8%	19.2%	8.1%	517
15.	I feel that I am doing as well in EVE Online as I had hoped.	5.8%	20.7%	20.8%	38.6%	14.1%	518
16.	I feel that I am doing as well in my life as I had hoped.	11.6%	25.1%	22.2%	34.0%	7.1%	518

*. N is the number of participants who answered this question.