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Virtual-self identity construal in online video games: a Repertory Grid study protocol

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Virtual-self Identity Construal in Online Video Games: A Repertory Grid Study Protocol

Abstract. *The aim of this project is to study the role that online videogames play in the way people build their identities. More specifically, the project is intended to study how people use online videogames and virtual avatars to explore alternative identities. It is possible for people to manifest entirely different versions of themselves through their virtual characters. Sometimes, those alternative identities may be a projection of what players consider ideal versions of themselves. Several variables may strengthen or hinder this capacity to project the ideal self onto a customizable "virtual self". Some of these factors are inherent to the individual, while others may be more related to the specific game they play. The repertory grid technique will be used to explore online videogame players' construct systems and to understand their need to explore alternative identities through their videogame characters. Other instruments will also be administrated to measure the degree of immersion that game players experience, to determine which aspects of play are the most appealing to them, and to gather data on their degree of subjective psychological well-being, all in order to assess how these variables, in addition to the others extracted from the repertory grid, may affect this identity exploration.*

Keywords: *MMORPG; immersion; personal constructs; actual self; ideal self*

Construcción de identidad virtual del yo en videojuegos en línea: un protocolo de estudio de la técnica de la rejilla

Resumen. *El objetivo de este proyecto es estudiar el papel que juegan los videojuegos online en la forma en que las personas construyen sus identidades. Más concretamente, el proyecto pretende estudiar cómo las personas utilizan los videojuegos online y los avatares virtuales para explorar identidades alternativas. Es posible que las personas manifiesten versiones completamente diferentes de sí mismas a través de sus personajes virtuales. A veces, esas identidades alternativas pueden ser una proyección de lo que los jugadores consideran versiones ideales de sí mismos. Varias variables pueden fortalecer o dificultar esta capacidad de proyectar el yo ideal en un "yo virtual" personalizable. Algunos de estos factores son inherentes al individuo, mientras que otros pueden estar más relacionados con el juego específico que juegan. La técnica de la rejilla se utilizará para explorar los sistemas de constructos de los jugadores de videojuegos en línea y comprender su necesidad de explorar identidades alternativas a través de sus personajes de videojuegos. También se administrarán otros instrumentos para medir el grado de inmersión que experimentan los jugadores, para determinar qué aspectos del juego les atraen más y para recopilar datos sobre su grado de bienestar psicológico subjetivo, todo con el fin de evaluar cómo estas variables, además de las demás extraídas de la técnica de la rejilla, pueden incidir en esta exploración identitaria.*

Palabras clave: *MMORPG; inmersión; constructos personales; yo real; yo ideal*

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Introduction

New technologies, especially those that involve virtual environments, have become so prevalent in our everyday lives that they are slowly but surely transforming our conception of social interaction and even the very idea of self-identity. Nowadays, people can assume completely new personas on the internet, using the anonymity that online environments provide to explore different ways of interacting with others and to adopt new virtual identities without the social risks that would accompany such identity changes in real life. This phenomenon has become especially notable with the rise of online videogames.

Videogame research is a relatively new field. Although scholarly interest in videogames stretches as far back as the medium itself, early psychological studies involving these games often centered on their possible effects on people's behavior, or more specifically on whether they could be responsible for higher aggression levels or even for inciting people, especially children and adolescents, to commit violent acts (Ballard & Wiest, 1996; Schutte et al., 1988). These studies arrived at different results over the years, but a meta-analysis by Ferguson (2007) could not find any solid relationship between exposure to violent videogames and aggressive behavior. However, in more recent years, research on the topic has expanded to encompass a wider range of aspects. Especially since the rise of online games, and more specifically with the growing popularity of so-called Massive Multiplayer Online Role-Playing Games (MMORPG), researchers have become more and more interested in how we behave socially in a virtual medium that grants us the possibility to adopt a new identity in the form of a character we can make up by ourselves. MMORPGs have attracted special attention both due to their social nature (as a forum where players come together in both cooperation and competition) and to the fact that, rather than providing players with predetermined characters, these games allow players to create a customizable character that serves as their virtual avatar inside the game. A study using an avatar creation software program (Jin, 2010), found that people who were instructed to create a virtual avatar representing their ideal self felt a greater connection with their avatars than people who were instructed to create one which faithfully represented their actual selves. However, this study only contemplated the physical aspect of a player's identification with their virtual avatar. Another study by Bessière et al. (2007) looked at how MMORPGs offer the chance for identity exploration. These researchers observed that players tended to create their characters more to resemble their ideal selves than their actual ones. In fact, they viewed their virtual avatars as having more desirable personality traits in the Big Five model than their actual selves. Additionally, in a more recent study, it was observed that other factors may work as modulators for this phenomenon (Przybylski et al., 2012). Variables such as the level of immersion experienced during the game or possible discrepancies between the actual and ideal selves have been shown to increase the likelihood that people may create a virtual avatar that possesses the physical and behavioral characteristics ascribed to their ideal self. Hart (2017) attributed this influence to the fact that players projected their ideal selves onto their avatars in order to explore their desired traits in a safe environment with lesser real-life consequences.

However, most of these studies have been conducted by administering personality tests such as the Big Five, with participants completing these tests sequentially as themselves and their virtual character. This procedure has some limitations since, even though those pre-established personality categories are standardized to be applicable to most individuals, they may not be able to fully grasp the more subtle nuances of someone's identity. For that purpose, a constructivist perspective is more suitable because it focuses on the participants' own personal, subjective views. Theories based on a constructivist epistemology, such as Personal Construct Theory (PCT; Kelly, 1955/1991), provide a tailored assessment of each individual's perception of the world and themselves, instead of classifying them into pre-established dimensions that may or may not belong to their meaning system. However, to the best of our knowledge, no studies have addressed identity construction in video games within the framework of PCT, a theory that can provide a deeper insight into a person's way of understanding their own self in the context of their interpersonal world (both real and virtual). By assessing their construct system, the study aims to understand how people may employ their videogame characters as a way to explore a new virtual identity, as well as how their self-concept may be related to the virtual identity they end up construing.

Personal construct theory, the 'community of selves' and virtual identity

As first posed by Kelly in 1955, PCT (see Chiari & Nuzzo, 1996; or Walker & Winter, 2007) adopted a constructivist view focused on the way we interpret reality. PCT states that individuals build their perception of the world through an evolving construct system formed by a network of bipolar constructs (i.e., sensitive vs. selfish) which they apply to everything they experience across their lives. Constructivist thinkers believe that the objective nature of the world is impossible to truly perceive. Kelly viewed each individual as an "everyday scientist" who builds a construct system with their experience in order to understand and anticipate the world. With every new experience, personal constructs can be confirmed, revised, or even discarded. This process contributes to the gradual creation and validation of a system that allows us to better predict our environment, as we form expectations about other people and events based on where they lie in our construct system (Botella & Feixas, 1998). This perspective allows for a more subject-focused approach to the

study of identity, one that focuses on how every person's construct system is formed and what beliefs and experiences support it.

According to Oyserman et al. (2012), a person's identity can be defined as a collection of values, traits, temperaments, and roles that define who they are, and that help differentiate them from others. These characteristics tend to be stable over time, albeit context-dependent, and they allow people to modulate their responses to their environment. When people are presented with a decision, they will tend to choose the option that is most congruent with their identity. The awareness of these traits as being part of a unique individual is what some may call the notion of "self". One of the most accepted definitions of the self is the subjective perception of being an individual who is distinct from others, with a distinctive set of skills and characteristics which configure the person's identity. There can be, however, different facets of the self, just as the characteristics that form a person's identity can vary depending on the context. Some basic examples are the ideal self, the future self, the social identity, etc. This suggests that different versions of a self can coexist simultaneously (Mair, 1977; Oyserman et al, 2012). Other authors (Lester, 1992; Ogbonnaya, 1994; Ogilvy, 1977) have presented the idea of the self as made up of a multiplicity of different identities that appear (or do not) depending on the context. This idea of a "community of selves" (Mair, 1977) implies that people may behave completely differently in different environments such as work, home, or in their various social circles, leading to a series of different identities that a single person can hold, according to their relational context. As Lester stated in his multiple self theory of the mind (2010), different facets of a person's identity can manifest at any given time (irrespective of the person's mental health) and the sort of "collaborative" function of all the multiple selves helps us succeed in different situations where different types of character may be needed. Another interpretation of the "community of selves" comes from Markus and Nurius's concept of "possible selves" (1986). These scholars proposed different versions of a person's self which represented what they were, what they could become, what they wanted to become, and what they are afraid of turning into. These "possible selves", according to Markus and Nurius, served as behavior motivators, as people would try to avoid becoming the feared self and aim to become the desired one. This range of selves also allows people to evaluate the actual self by comparing it to the other "possible selves". In this context, the notion of a virtual self is worth exploring, since it may serve as a possibility to live through one of those possible selves, test how desirable or undesirable it is, and use that experience to evaluate both the current self and the notion of the other possible selves.

Going back to the context-dependent self, even though people may show different aspects of themselves in certain situations, each contextual identity is relatively stable on its own. People generally refuse to change their established selves and may go to great lengths in order to act according to them. This is because, as established by Lecky in 1945, self-stability is by itself a motivating factor, and people find it rewarding to act in a way that is congruent with their identity, as it serves as a "stable anchor" (Oyserman et al., 2012 and Stevens, 1992). This may be why, when confronted by the need to explore a more desirable identity than the ones we already exhibit on a daily basis, we find it much easier to seek out a new environment where our identity has not been established yet. This way, we can explore new traits, perhaps more rewarding ones, without the need to risk our sense of self-stability. Taking this possibility into account, it is likely that online videogame players employ their virtual avatars as another facet of their selves, allowing them to playfully explore new identities in a different context. In addition, the perception that there are no real-life consequences to their actions in the game may encourage players to build their virtual identities more freely, without many social constraints or physical limitations. For example, online videogame players who feel more distanced from their ideal self may tend to create a virtual avatar that shares many aspects with said ideal self. They do this as a means to project it onto their virtual selves in search of personal satisfaction (Hu et al., 2015; Przybylski et. al, 2012). On the other hand, people who are already satisfied with their actual self may instead create a virtual self that is entirely different from both their actual and ideal self as a means to explore alternative identities that are completely new to them. The mere act of exploring different identities and "letting go of the current self", something that has been called "identity tourism", has been shown to be rewarding in and of itself, without any need for the new identities to overcome perceived limitations of the actual self (Gilbert et. al., 2014; Ribeiro, 2009). This is an example of how new technologies, especially online gaming, have changed the way we understand identity. By enabling and encouraging people to create a new persona from the safety of anonymity and from a playful perspective, these technologies allow for a more fluid and variated exploration of identities, making the already malleable self even more so than ever before and leading to a concept of identity as ever-evolving (Ribeiro, 2009).

The Repertory grid technique and self-construing variables

With PCT, it is possible to explore many aspects of a person's identity. By studying a person's construct system, one can find a great deal of information about how they perceive themselves, their conception of what they aspire to be, and the constructs they most often employ to describe their experience of reality via social interaction. That is why since its inception PCT has offered an insightful perspective on human cognition. For example, this theory enables a more in-depth study of the values and beliefs that make up the templates

with which we construe our own reality, going beyond a classification into pre-established categories. Not only is it useful in efforts to understand someone's identity construal, but it also allows researchers to observe how people perceive themselves and how this perception relates to significant people in their lives, as well as to the constructs associated with the ideal self. Moreover, in our field of research, PCT allows for the exploration of gamers' construal of their virtual selves, of the constructs they use to define them, and whether these virtual selves most closely resemble their ideal self, their actual self, someone from their relational context (i.e., brother), or none of these.

Based on this theory, in 1955 Kelly created the repertory grid technique (RGT) to assess the main constructs that individuals use to view themselves and others. With the incorporation of a rating system (see Feixas & Cornejo, 1996; Fransella et al., 2004), it became possible to gauge the degree to which they perceive themselves as similar or different from other people, and their representation of what they would like to be (i.e., "ideal self"). With the RGT, it is possible to obtain a visual representation of the construct system through which a person perceives and interacts with reality, and to observe where different elements of their life (i.e., family, friends, or significant others) fall under those constructs. With that, a number of self-construal measures can be obtained, including the person's perceived similarity to others or their self-ideal discrepancy (a measure usually related to self-esteem). Lester (2010) advocated the use of this method as an instrument to analyze the multiple selves that may make up one's identity. This way, we can study in detail the construct system of online videogame players, observing the constructs they use in their perception of reality, those that are most significant to them, and those they most associate with themselves and with their virtual characters, which we have included in the grid by adding a "virtual self" element. All this information will be of great value for the study of virtual identity, shedding light on how it is construed in terms of content (the specific constructs associated with it) and structure (for instance, how close or far away it is from both the actual and ideal self, or what we call the 'self-virtual' and 'ideal-virtual' discrepancies, respectively; see method section).

From the relationships between and among elements and constructs, reflected in the grid data matrix, other measures can also be extracted that will help the study, as they may have a considerable impact on the way people project alternative identities onto their virtual characters. One of these variables is the previously mentioned self-ideal discrepancy, but, for this project, two additional measures will be extracted as a result of the inclusion of the virtual self on the participants' grid. These measures are the self-virtual discrepancy, understood as the distance between the actual self and the virtual self, and the virtual-ideal discrepancy, which is the distance between the virtual self and the ideal one. These data will allow us to assess the degree to which the participants perceive their videogame characters as similar or different from their actual identity outside the game, and from their idea of how they would like to be.

Another variable that can be extracted is the presence of cognitive conflicts within participants' construct systems, such as implicative dilemmas. These dilemmas can appear in a person's construct system when the problematic pole of a discrepant construct (one where the ideal and actual selves lie on opposite poles, i.e., the "unhappy" pole from the "happy - unhappy" construct) is associated with the desired pole from a congruent construct (one where the ideal and actual self lie on the same pole, i.e., the "selfless" pole from the "selfish - selfless'' construct). This creates a situation where a change to the desired pole on the discrepant construct would be associated with a negative change on the congruent one (i.e., being happier would imply becoming more selfish; see Feixas et al., 2009; Montesano et al., 2015, for a review). The presence of these implicative dilemmas could lead to variations in the way people construe their identities in virtual environments. Yet another variable that will be researched is one known as interpersonal construct differentiation (Feixas et al., 2004), defined as the tendency of a construct system to perceive the self and other elements through several dimensions, with different nuances, rather than reflecting mostly one basic underlying dimension. This measure is an indicator of differentiated thinking and cognitive complexity on the part of the person, and it may have an impact on their capacity to hold different simultaneous facets of the self (such as videogame characters with identities different from their actual self). Because of this capacity of PCT to deeply explore each individual's construct system, that is, the meaning framework with which they interpret the world, this method can constitute a much more fruitful way to understand an online videogame player's sense of self and use of virtual avatars as identity exploration tools than other approaches which are limited by their own pre-established categories. These categories are usually operationalized into items on questionnaires, which may or may not be suited to a given individual's specific personal and virtual identity or take into account their multiplicity of selves.

Other specific variables may affect players' identity exploration through their virtual selves, which is why other instruments will be included in this project to measure participants' psychological well-being, as well as more specific ones such as those gathering data on the level of immersion during the game and the main motivations that drive them to play. These variables, along with the previously mentioned ones, like cognitive differentiation and the possible presence of cognitive conflict within the construct system, may be associated with different types of online videogame players in terms of the relationship between their actual, ideal, and virtual selves.

Towards a typology of online videogame players' virtual self construal

As mentioned above, no empirical data have been published on this issue to date. However, from a theoretical perspective, we can think of several possible configurations of the relationships between actual, ideal, and virtual selves, leading to four types of online videogame players' virtual selves. The first is the *projection-type players*, referring to those who construe their virtual identities as closer to their ideal selves in order to experiment in a virtual environment with the attributes they perceive as most desirable (see Figure 1). People who perceive themselves as more distant from their ideal selves may be more likely to create an idealized virtual self. Lower levels of psychological well-being, as well as higher levels of cognitive conflict, could increase the intensity of this projection of the ideal self onto the virtual one by players with a high self-ideal discrepancy.

The second type is the *exploration-type player*. In contrast to the previous one, players of this type may create virtual avatars that are farther removed from both their actual and ideal selves in order to explore alternative identities, not necessarily tied to their need to experience their ideal attributes, but rather for the enjoyment of exploring completely different ones. Those players who already perceive themselves as close to their ideal selves would be more likely to fall into this type since they would not feel such a need to experience their ideal self through a virtual character. We can see that possibility illustrated in Figure 2.

The third type is called the *proximal-type player*, one whose virtual self more closely resembles their actual self, regardless of its distance from the ideal self (Figure 3). Players might adopt these selves either when the level of immersion during the game is too low for them to feel identified with their virtual avatars, or when they play the game in a more competitive manner rather than as a way to interact with other characters, thus leading them to view their avatar more as a tool for competition than as an extension of their identity. Another explanation for why this type of player may not express a different aspect of their self through their virtual avatar may be because of a low degree of cognitive complexity, which would make it harder for them to grasp different facets of their identity.

Figure 1. Graphical representation of the projection-type player

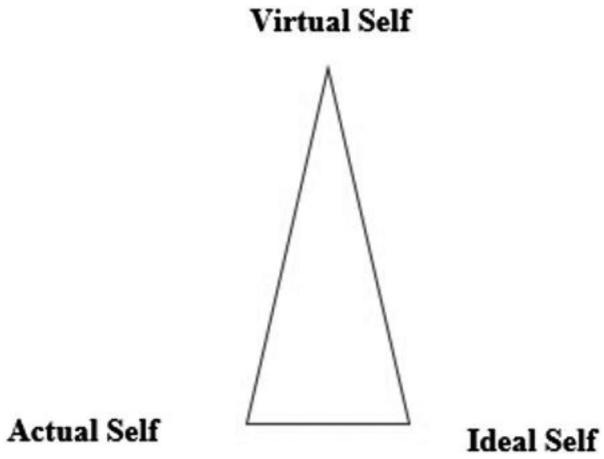

Figure 2. Graphical representation of the exploration-type player

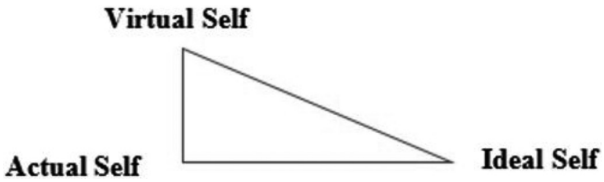

Figure 3. Graphical representation of the proximal-type player

Figure 4. Graphical representation of the unspecified-type player

Lastly, we can think of the *unspecified-type player*, representing people whose virtual self is perceived as nearly equidistant from their actual and ideal selves without those two being necessarily close, as we can see in Figure 4. Although mathematically this may be a possible outcome of the actual-ideal-virtual self relationships, there is no theoretical premise that would account for this. Hence, it should be considered an unusual possibility, but one that would be worthy of careful study if its prevalence were found to be significant.

Aims of the study

This project is intended to further the current knowledge on the ways virtual environments have changed how people construe their identity. It also aims to explore how different identities may be explored thanks to those virtual environments and how different factors associated with both the game and the player, such as self-esteem, the presence of cognitive conflict, and the immersion experienced during gameplay, may affect this identity exploration.

More specifically, the study will focus on how people may create a virtual identity that is distinct from their actual self via their videogame characters. It is also designed to assess how different people may create their virtual selves differently, whether they create a character that more closely resembles their ideal self or if they instead decide to explore an identity that is different from both who they are and who they want to be.

Concerning players' experience during the game, the project seeks to investigate whether the level of immersion, autonomy, competence and relatedness perceived influence players' construal of their virtual selves. Meanwhile, differing motivations to play MMORPG might lead to different experiences of the virtual self. With this in mind, the study will assess whether players who adopt a more competitive orientation are more or less likely to explore alternative identities through their virtual avatars than those who are more driven by the social aspects of gaming.

The study will also explore videogame players' psychological well-being as a factor with a potential influence on the way they project their ideal self onto their virtual avatars, since people who feel great levels of psychological distress may be more prone to use virtual environments as a way of escaping reality. Previous studies have already shown psychological well-being to be closely related to both the engagement experienced by videogame players and their perceived connection with their virtual avatars (Przybylski et al., 2012). Another variable that may play a role in the participants' way of representing themselves virtually is the presence of cognitive conflicts or dilemmas. A greater amount of internal conflict could influence the way players explore different identities through a virtual avatar. Since cognitive conflict can be a source of dissonance when a person construes their ideal self, it is worth researching how this might affect their exploration of alternative virtual identities. In a similar vein, players' self-esteem levels will also be taken into account, since people who are more dissatisfied with how they perceive themselves may be more inclined to project their ideal selves onto a virtual character (Hu et al., 2015)

Secondarily, the role other key variables may play in the way these players conceive their virtual self will be studied. The RGT offers the possibility to study other features of the construct system such as the perceived distance between significant others (parents, siblings, friends...) and their actual, ideal, and virtual selves, the polarization of the player's construct system, and their cognitive complexity. As mentioned above, this latter concept is especially relevant, since a higher degree of complexity may make it easier for people to explore different identities and, thus, to hold more simultaneous expressions of the self. Conversely, a lower degree of cognitive complexity could make it harder for them to hold alternative expressions of the self and may lead them to create a virtual self that is closer to their actual self. However, this latter objective will be studied in a more exploratory manner and will not be included in our hypotheses, since there is still no theoretical background on the matter to support them.

We consider this project to be of great importance in shedding light on the part that new technologies and virtual environments play in identity construal. In a matter of twenty years, the rise of widespread online environments has allowed us to create and explore new identities in the form of a virtual self (e.g., videogame avatar, social network identity), and the exploration of this idea of virtual identity is necessary if we are to adapt identity research to this new age of online technologies.

Hypotheses

Hypothesis 1: We expect that the optimal clustering model for online videogame players according to their virtual-self construal will match our previously described categories: projection, exploration, and proximal types. The three resulting groups will be distinct from each other in terms of the key variables. On the one hand, one group (proximal type) will present a lower self-virtual discrepancy than the others. On the other hand, the other two groups (exploration and projection types), will differ in terms of their virtual-ideal discrepancy, with the exploration type having a higher discrepancy than the projection type.

Hypothesis 1.1: Participants that fall within the projection type will also display lower self-esteem than those in the proximal or exploration type.

Hypothesis 2: Different variables associated with gaming will modulate the *players' virtual self-construal* described in the first hypotheses (if confirmed):

Hypothesis 2.1: We expect that the amount of exploration or projection may vary depending on the degree of immersion perceived by players during the game, with a higher degree of self-virtual discrepancy accompanying greater levels of immersion.

Hypothesis 2.2: We expect that different motivations for playing online games will be linked to the type of player. The projection-type and exploration-type players will present a significantly higher motivation for their in-game relationships than those of the proximal-type, whereas proximal-type players will present a higher motivation for the competitive aspects of the game.

Hypothesis 3: Within projection-type players, different personal variables will also play a role in their degree of projection (defined as a low virtual-ideal discrepancy).

Hypothesis 3.1: We expect that the lower a player's psychological well-being, the lower their virtual-ideal discrepancy will be.

Hypothesis 3.2: We expect that participants with higher levels of cognitive conflict will show a lesser virtual-ideal discrepancy than those with low levels of conflict.

Hypothesis 3.3: We expect that participants with lower levels of self-esteem will show a lower virtual-ideal discrepancy than those with high self-esteem.

Methods

Participants

The sample recruited will be made up of 200 international young adults who play online videogames with customizable character options on a regular basis. For

		Elements															
Constructs		Actual Self	Virtual Self	Mother	Father	Brother 1	Brother 2	Grandmother	Friend 1	Friend 2	Friend 3	Friend 4	Colleague 1	Colleague 2	Non Grata	Ideal Self
1. Good leader	1. Apathetic	3	1	2	5	5	6	1	3	3	4	4	7	4	7	2
2. "Overprepared"	2. Carefree	2	1	1	3	7	5	2	2	2	3	5	5	2	6	2
3. Insecure	3. Secure	2	6	5	6	7	4	6	4	6	5	6	4	1	6	5
4. Headstrong	4. Lets other people influence him/her	4	3	1	1	1	2	2	3	2	5	1	1	6	1	3
5. Stubborn	5. Reflexive	6	5	5	1	2	1	3	6	4	5	2	1	4	1	3
6. Emotionally close	6. Keeps emotions to him/herself	4	2	2	6	7	4	5	5	2	2	6	4	2	6	2
7. Emotional	7. Cold	1	4	2	7	6	4	3	5	5	2	6	3	1	5	4
8. "Nerdy"	8. "Normie"	1	2	3	6	3	1	6	1	1	1	1	2	1	1	1
9. Manipulative	9. Manipulable	7	4	5	2	4	1	5	5	6	6	3	1	4	3	4
10. Extrovert	10. Introvert	4	3	3	1	1	7	2	5	3	4	2	2	6	4	3
11. Enjoys the outdoors	11. Home-staying	6	4	5	2	1	7	2	5	3	6	2	3	3	7	4
12. Selfish	12. Selfless	6	4	6	2	1	1	7	5	5	6	2	2	5	2	4
13. Perceptive	13. Aloof	2	2	1	4	5	2	1	2	2	2	6	6	2	7	1
14. Loving	14. Surly	1	3	2	7	6	4	2	3	3	1	5	5	2	6	1
15. Brave	15. Coward	2	2	3	5	5	6	1	2	3	3	1	6	7	5	2

Figure 5. Example of a repertory grid after the interview, obtained from a voluntary participant in the pilot test.

the purpose of this study, we will include only users of the videogame World of Warcraft, which is currently one of the most played MMORPGs. Specifically, the inclusion and exclusion criteria are:

Inclusion criteria: All participants must have an active World of Warcraft account.

Exclusion criteria: Participants who play World of Warcraft or any other game as professionals will be excluded from the study. Those who consume drugs while playing or have a previous or current record of severe mental disorders will be excluded as well. Finally, those participants who do not have a high enough level of competence to communicate in Spanish or English, or participants with substantial hearing or cognitive deficits will not be included.

Participants will be asked to complete an online survey, followed by an online interview. In all, they will be assessed for different variables using the following instruments:

Instruments and measures

Sociodemographic survey: Participants will be asked to fill out a brief survey asking for basic sociodemographic data, as well as about their playing habits. This will be done in order to control such variables and as part of our inclusion/exclusion criteria. The information requested will be the following:

– *Sociodemographic data*: Participants will be asked their age, gender, country and city of residence, educational level, employment status, and whether they have been diagnosed with any psychological disorder. They will also be asked for their email address in order to make it possible to contact them to schedule an online interview.
– *Playing habits*: Participants will also be asked to provide an estimated average of the number of hours per week they spend playing World of Warcraft, how long have they been playing, how many avatars they possess within the game, if they play the game professionally, and if they play it under the effects of alcohol or other drugs.

The repertory grid technique *(*RGT*;* Feixas & Cornejo, 1996; Fransella et al., 2004*):* It is a semi-structured interview aimed at eliciting the most salient constructs with which interviewees construe their interpersonal reality, how the constructs are organized and how they are used to assess the following elements: the actual self, the ideal self, and a series of different people that are meaningful to the participant (parents, close friends, co-workers, etc.). For the purpose of this study, we will include an additional element, called the "virtual self", which is meant to represent the participant's perception of their main avatar in the game.

Constructs are elicited during the interview from each participant using iterative questions of similarity/difference among the elements and expressed in two poles (for example, "brave vs cowardly"). When the interview reaches a saturation point at which the interviewee cannot express any new constructs, the interviewer stops the iterative questioning and asks the interviewee to rate every element on a seven-point Likert scale for every construct. Once this process is finished and the elements have been rated, the instrument looks like a grid or lattice, where columns represent the elements and each row represents one of the constructs the interviewee used to make sense of their interpersonal world. An example of the resulting grid matrix can be seen in Figure 5.

The data matrix resulting from this process can be mathematically analyzed in different ways aimed at characterizing a variety of aspects of the interviewee's construct system. For this study, we will focus on the following measures:

a) Self-construal: These are measures indicating how participants perceive themselves in relation to other elements of their construct system, including the perceived distance between the actual self, the ideal self, and the "others" element (an average representation of the significant people in their lives that were mentioned during the interview). Specifically, the self-construal measures are:
   - *Self-ideal discrepancy*: It is the Euclidean distance between the ratings of the ideal and the actual self elements, usually interpreted as a measure of self-esteem. Hence, a person who perceives their actual self and their ideal self as similar (low discrepancy) is considered to have high self-esteem. In our example grid (see Figure 5), the interviewee presents a self-ideal discrepancy of 0.31, which would be interpreted as a short distance and thus indicative of relatively good self-esteem (although in this case, the interviewee would be nearing the threshold of 0.32) (based on data from previous studies comparing community and clinical samples); higher scores would be considered as of high self-ideal discrepancy).
   - *Self*-others *discrepancy*: It is the Euclidean distance between the scores for the actual self of the interviewee and those assigned to the other people in their lives (those included in the grid). It can be used as a measure of perceived social isolation; thus, a high discrepancy suggests that the person feels more dissimilar from others, even if the interviewee is not physically alone or does not feel lonely. Conversely, a low discrepancy might indicate a high degree of identification of the self with other people. The person in our example grid presents a self-others discrepancy of 0.35, which would be regarded as a long distance and, thus, an indication that she tends to perceive herself as substantially different from the people around her.
   - *Ideal-others discrepancy*: It is measured with the Euclidean distance between the ratings for the ideal self of the interviewee and the average of the elements representing significant people in their grid ("others" element). It can be interpreted as the perceived adequacy of (or satisfaction with) these significant people. In our example grid we found an ideal-others discrepancy of 0.23, which can be interpreted as a short distance. This indicates a high level of satisfaction on the part of the interviewee with the significant people around her.

   For the purpose of the study, we will add two new measures of self-construal:
   - *Self-virtual discrepancy*: It is calculated by measuring the Euclidian distance between the ratings for the actual self and those for the virtual self. It is meant to gauge the degree of a player's identification with their virtual self (a low distance indicates a high degree of identification). The grid of the interviewee in our example yielded a self-virtual discrepancy of 0.33, indicating a long distance. This can be interpreted as showing that the interviewee feels dissimilar from her virtual self, although she is very close to the threshold.
   - *Ideal-virtual discrepancy*: It is defined as the Euclidean distance between the ratings for the ideal self and those for the virtual self. This measure indicates the degree of (dis)similarity between these two elements. In our example grid, we found an ideal-virtual discrepancy of 0.16, indicating a short distance. The interviewee seems to have idealized her virtual self.

b) Cognitive conflict*:* This concept will be assessed with the two following measures that indicate internal conflict or dilemmas in the construct system of the interviewee.
   - *Presence of implicative dilemmas (ID):* IDs are identified when there is a significant correlation between the undesired pole of a congruent construct and the desired pole of a discrepant construct. The threshold for identifying the presence of IDs has been set to 0.20 for clinical practice, although for research purposes it is established at 0.35 to minimize Type I errors (Rouco et al., 2018). For this study, the presence of IDs will be examined, as will their percentage with respect to the number of constructs in the grid, and their intensity, calculated by the square root of the sum of the squared correlations between the constructs involved in the implicative dilemmas. The interviewee in our example showed no implicative dilemmas in her construct system, as depicted in her repertory grid.
   - *Presence of dilemmatic constructs:* A construct is considered dilemmatic when the interviewee rates the ideal self with a score of 4 (that is, the exact middle point between the two poles of the construct). Dilemmatic constructs can be interpreted as indicating that participants have difficulty determining what they view as the ideal with regard to a particular characteristic expressed in the construct labels. The presence or absence of such constructs will be examined, as well as their percentage with respect to the constructs in the grid. In our example grid, the constructs "emotional - cold", "manipulative - manipulable", "enjoys the outdoors - homebody", and "selfish - selfless" are presented as dilemmatic. This indicates a tendency to try to avoid both poles in situations in which these constructs are relevant, as she does not perceive either of the poles as desirable.
   - *Interpersonal cognitive differentiation:* It is measured by calculating the percentage of variance accounted by the first axis after correspondence

analysis of the grid data matrix. It is interpreted as an indicator of unidimensional or simplistic thinking, in cases of low differentiation (high percentages), and multidimensional or complex thinking when the differentiation is high (low percentages). It is a measure of the complexity of the cognitive system through which individuals construe their experiences, the degree to which they do or do not use nuances in discriminating among self and others. The example grid in Figure 5 has a 50.51% of the variance accounted by the first axis, indicating a low differentiation. This suggests that the interviewee has a way of thinking that is more unidimensional and devoid of nuances.

The RGT has shown to have test-retest reliability between 0.71 and 0.77 for the elements, and between 0.48 and 0.69 for the elicited constructs. For some of the measures extracted from the RGT, test-retest reliability coefficients of between 0.61 and 0.95 have been estimated (Feixas et al., 1992; see Feixas & Cornejo, 2002, for a review). In 2001, Caputi and Keynes also found that the self-ideal discrepancy measure presented a considerable degree of test-retest stability, ranging from 0.61 to 0.81.

Player Experience of Need Satisfaction (PENS): This questionnaire developed by Ryan et. al. (2006) will be adapted into Spanish and validated as a separate project. It is composed of 21 items, distributed in five factors that measure different aspects of a player's experience during the game. The "Immersion" scale will be used as a measure for hypothesis 2.1. The other scales are "Autonomy", which measures the freedom of choice experienced by the player; "Competence", which measures perceived efficacy in the game; "Relatedness", which measures the importance given by the player to their relationships inside the game and "Intuitive Controls", which measures the player's perception of how easy it is to comprehend the game controls. These later scales, especially "Relatedness" and "Competence" will be used to infer which aspects of the game the participants are more drawn to for hypothesis 2.2. The "Relatedness" scale will also be key to assess participants' relationships within the game, something of great interest given the inherently social component of identity construal.

This questionnaire has proved to have an acceptable model fit and good discriminant validity, aside from some overlapping between the "Competence" and "Intuitive Controls" scales (Johnson et al., 2018).

Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM): Developed by Evans et al. (2002), this 34-item questionnaire will be used, along with its Spanish version (Trujillo et. al.,2016), depending on the preferred language, to measure participants' level of psychological distress. It is made up of four domains: Subjective Well-being, Problems/Symptoms, "Functioning", and "Risk", which works as an indicator of aggression to self and/or others, and of suicidal ideation. These four scales will be used to assess different dimensions of human distress and the levels of psychological well-being experienced by the participants.

The original version of the CORE-OM showed high internal consistency (Cronbach's alpha between 0.75 and 0.94 for all scales) and test-retest stability of 0.91 over the course of one week (Evans et. al, 2002). The Spanish version of this instrument also has been shown to have high internal consistency (Cronbach's alpha between 0.7 and 0.9 in all scales) and adequate test-retest reliability over 15-30 days (0.76-0.87 of test-retest correlations in all scales, except for "Risk", which had a correlation of 0.45; Trujillo et. al., 2016).

Rosenberg Self-Esteem Scale (RSE)*:* This scale was developed by Rosenberg (1965) as an instrument to measure self-esteem. The instrument consists of a single scale of 10 items, and it will be used to measure participants' level of self-esteem.

The scale has a high internal consistency (0.92) and excellent test-retest reliability (correlations that range between 0.85 and 0.88 over the course of two weeks, Rosenberg, 1979)

Procedure

This project was approved by the Bioethics Commission at the University of Barcelona. The protocol was developed following the criteria of international standards (SPIRIT Statement guidelines, Chan et al., 2013; STROBE, von Elm et al., 2007). Experts in the fields of data analysis and Personal Construct Theory were consulted for the design of the protocol, and it was registered on ClinicalTrials.gov (NCT04551638).

Potential participants will be contacted by making an online call on highly frequented Internet forums such as the official forum hosted by *Blizzard* (the developer company of World of Warcraft). We will provide a link for players who may be interested in participating to access the study. Although this is a cross-sectional study, data will be collected at two different moments, firstly with an online survey carried out with Qualtrics software (Qualtrics, 2005), and second with an online live interview to administer the RGT. The survey was designed taking the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines (Eysenbach, 2004) as a reference.

Participants who click on the link will be directed to the online survey. It will begin with a brief explanation of the study and the informed consent form, according to which no personal data will be revealed aside from information strictly necessary for the study. The study will comply with all aspects of the European Organic Law on Protection of Personal Data and Guarantee of Digital Rights (Organic Law 3/2018, of December 5). After reading and accepting the informed consent, participants will be asked about the previously mentioned sociodemographic data and their

playing habits. They will also be asked to answer the PENS, CORE-OM and RSE questionnaires. The total duration of the survey will be 14 minutes, approximately.

After completing the survey, participants who meet the inclusion criteria will be sent an email to schedule a date for the face-to-face online interview conducted using the latest version of Discord (Discord Inc, 2015) (one of the most widely used videoconference software programs within the gaming community) or any other convenient software. During this one-to-one meeting, a specifically trained postgraduate student will administer the RGT to the participant, a process that will last for about 70 minutes. The RGT will be administered with the support of the EYME software (Mind & Identity, 2020) and analyzed with the GRIDCOR 6.0 software (Garcia-Gutierrez & Feixas, 2018).

Participants will receive no payment for their collaboration, but upon completion of this project those who wish it will receive a brief feedback report based on the results of the assessment.

All participant data will be stored on an encrypted database inside the institutional OneDrive™ account of the project's lead researcher. Data will also be stored in the Qualtrics account used for the design of the survey. Given Qualtrics' Data Protection Impact Assessment (DPIA), as well as their ISO27001 certificate and Fred RAMP authorization (more information at https://www.qualtrics.com/uk/platform/gdpr/), these databases will be accessible only by the researchers involved in the data analysis of the study. Personal data will be anonymized by identifying each participant with a numerical code to minimize the risk of identification, as well as contributing to easier and safer data management.

Although missing data will be minimized as the survey will be conducted online with all items set as obligatory fields and because the RGT will be carefully administered during interviews, in the event missing values were found, the participant would be contacted asking to provide them. In case the participant cannot be contacted or does not wish to answer, their data will be removed from the analysis and the participant will be registered as a drop-out.

Any substantial amendments to this protocol will be submitted to the Bioethics Commission at the University of Barcelona for approval and appropriately noted on the trial registries at ClinicalTrials.gov. Should the amendments affect the participants in any way, they will be informed of them and additional consent will be requested if needed. Non-substantial changes will be recorded and filed with date identifiers for different protocol versions.

Data Analyses

The data will be analyzed using the RStudio software. A K-means cluster analysis will be carried out, in which participants' will be specified to be clustered in three groups using their self-virtual, virtual-ideal, and self-ideal discrepancies as the clustering criteria. Once the analysis has rendered the three clusters, they will be labeled according to our player typologies. We expect that there will be one group where the self-virtual discrepancy will be lower, indicating a proximal type of players. We also expect that the two remaining clusters will be differentiated in terms of the participants' virtual-ideal discrepancies. Those with a larger discrepancy will be labeled as exploration-type and those with a lower discrepancy will be labeled as projection-type.

We will carry out a one-way ANOVA to assess if there is a significant difference in self-virtual discrepancy between proximal-type players and the other two groups. Another one-way ANOVA will be carried out to assess if there is a statistically significant difference between projection-type and exploration-type players in terms of their self-ideal discrepancy. These analyses will serve to test the first hypothesis. We will also carry out a one-way ANOVA to assess if there is a significant difference in self-esteem between projection-type players and the other two groups to test hypothesis 1.1.

After that, we will carry out a multiple linear regression model, taking the self-virtual discrepancy as the outcome and using as independent variables the level of immersion experienced, taken from the corresponding scale of the PENS, and the degree of cognitive complexity, inferred by means of the cognitive differentiation measure from the grid. With this analysis, we will test hypothesis 2.1 and explore whether participants' cognitive complexity affects their capacity to create a differentiated virtual-self.

To test hypothesis 2.2, we will carry out a one-way ANOVA to test whether there are differences between the three groups in terms of their motivation toward the social or competitive aspects of the game, which will be inferred through the "relatedness" and "competence" scales from the PENS.

Additionally, we will conduct a multiple linear regression model within each group, using as predictors the variables of immersion, relatedness, and competence, obtained with the PENS, as well as the psychological well-being obtained from the CORE-OM, the self-esteem measure obtained from the RSE, and the level of cognitive conflict and cognitive differentiation from the RGT. For the model performed on the proximal-type group, the outcome variable will be their self-virtual discrepancy. Participants' virtual-ideal discrepancy will be the outcome variable for the models performed on the exploration-type and projection-type groups. The model performed on the projection-type group will allow us to test hypotheses 3.1, 3.2, and 3.3, and all three models will be useful in order to profile the participants in a more precise way, as well as to explore which variables have a greater influence on the groups.

A power analysis had been conducted using the G*Power software (Faul et al., 2009) in order to calculate the sample size needed for such analyses. A one-way ANOVA with 200 participants across the four groups

in the proposed typology would be sensitive to effects of $\eta^2 = .06$ with 85% power (alpha = .05). Taking this into account, the expected sample size for the study was set at 200.

Expected benefits of the project

This study could increase our knowledge about how people construe their virtual identity. The proposed typology of videogame players' construal of their virtual self may shed new light on a subject that is too embedded in the everyday lives of thousands of young people to be ignored.

These player profiles, if confirmed, and the information on how they relate to other measures will provide some insights into the impact that new technologies, MMORPG in particular, are having on the construal of players' identity. Indeed, there are multiple virtual environments that allow people to interact with others (social networks, videogames, blogging, community forums, etc.), some of them even allowing the adoption of a completely new persona. This technological innovation has changed the way many people conceive their idea of who they are, how they behave, and how they relate to others. Therefore, the study of virtual identity construal is emerging as a major interdisciplinary subject for science and industry alike. In this sense, the findings of this project could have translational implications in the videogame industry or social network apps.

Concerning the field of psychology, a better understanding of how these new online interactive environments affect the construal of one's identity could bring with it a variety of different theoretical and practical implications. For instance, it could contribute to the endorsement of the theory supporting emerging professional positions (i.e., Chief Behavioral Officer) related to the design of tailored virtual environments that facilitate the construal of a helpful virtual self or the enhancement of user experience and client participation. From a health angle, the project may also provide helpful knowledge for people struggling with videogame addiction to get a better insight into their relationship with their virtual characters. Future research on the psychological meaning of virtual selves could expand to other technological contexts such as immersive virtual reality platforms for educational, entertainment or psychological purposes. Elsewhere, future research could also be done exploring whether the "virtual identity" carries over to other environments deprived of the technological component, such as tabletop roleplaying games.

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