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The digital transformation of human identity: Towards a conceptual model of virtual identity in virtual worlds

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Abstract

The current article explores patterns of identity development in virtual worlds, with the aim of introducing a conceptual model of virtual identity. Despite the rapid spread of virtual environments, no model has been developed to date that fully captures this complex entity. Rather than taking a purely social approach, as has been the dominant trend in most prior work, the structural elements used in this current framework incorporate several dimensions and approaches identity as a conglomerate of personal, social, relational and material aspects. Building on an extensive body of the available literature, with the current conceptual model, we intend to provide a comprehensive base on which to further expand theoretically as well as empirically in future work-related concerning identity in virtual worlds.

Keywords

Aspects of identity model, human–computer interaction, online behavior, virtual identity, virtual worlds

Introduction

The rapid diffusion of information technologies characterizing the past decades altered several aspects of our communication, social interactions and the ways in which we relate to one another (Tubella, 2005). In fact, our current digital era permeates our lives to the extent that today

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technology does not only determine society but in many ways it *becomes* society (Castells, 2007). From a global perspective, technology is interpreted by society according to the needs, values and interests of people using the technology (Thompson, 2005) and is based on the social uses that constantly redefine its particular meaning (Nass and Moon, 2000; Nass et al., 1994, 1995; Oppenheim, 2007). From an individual perspective, recent technological advancements have enabled various forms of virtual social engagements; interactions that in turn have been shown to influence individual and personality characteristics and the overall development of the self (Turkle, 1984; Zhao et al., 2008; Zizek, 1997).

In this current article, we explore aspects and patterns of identity development in virtual settings, with the underlying aim of constructing a comprehensive conceptual model of virtual identity. This notion is of particular importance, as it has the potential to assist psychologists, sociologists, and other scholars and practitioners in their quest for a more complete understanding of identity development within our current digital era. After a brief overview of virtual environments, we present a review of the traditional theories of identity, as these two constructs provide the basic building blocks necessary to explore virtual identities. Following, we turn to discussing virtual identity, along with our proposed model, taking into account the boundary between real and virtual existence.

Virtual worlds

The concept of virtual worlds represents a frontier in social computing and provides interesting areas for exploration in a variety of disciplines. In his visionary science fiction novel *Snow Crash*, Stephenson (1992) introduced a virtual world that he called *metaverse*, an environment in which individuals were able to construct their virtual selves, whilst completely abandoning their real lives. Whilst the setting for this fictional story was originally envisioned in an alternative and hypothetical future, since its inception, several virtual worlds emerged that in many ways replicate and expand upon Stephenson's earlier ideas.

In contemporary literature, the term *virtual world* has many definitions, due at least in part to its relative novelty and complexity (Bell, 2008). From a broad perspective, virtual worlds encompass imaginary spaces that may be described by words or projected through images and which are so realistic that individuals may feel as if they were immersed in them (Damer, 2008). Computers mediate these worlds and channel their imaginary and real dimensions into persistent three-dimensional (3D) spaces. Through connecting these computers to one another via the World Wide Web, several users may simultaneously participate in the same environment and experience the same virtual reality. Via their immersion, individuals gain the ability to project their fantasies onto cyberspace and form realistic connections to the environment as well as to other inhabitants (Wark, 2002).

Users enter virtual worlds through their *avatars*, which are specific digital representations of their virtual selves (Coleman, 2011). Furthermore, they have the ability to supplement the *physical* characteristics of their avatars by creating their own profiles, incorporating textual as well as visual information. From a participant perspective, the potential for immersion is a particularly revolutionary aspect, enabling individuals to engage in various complex activities and social interactions that resemble the real world (Wennberg, 2000). For instance, users can attend concerts, start businesses, take courses at virtual universities, shop, build, form romantic relationships and can even start families, to name just a few options available.

Papagiannidis et al. (2008) differentiate between two types of virtual worlds, game-oriented ones (e.g. World of Warcraft and other Massively Multiplayer Online Role-Playing Games

(MMORPGs) and socially oriented ones (Second Life), with the primary differentiating feature derived from the extent of freedom versus the number of rules imposed. On the one hand, MMORPGs have precise rules and regulations, limiting the availability of certain activities exclusively for specific characters. As an example, only wizards are allowed and able to exercise magic. In these settings, users have flexibility but only within certain boundaries. On the other hand, socially oriented virtual worlds grant their users practically unlimited freedom and options to create their characters and to engage in virtual activities. In other words, whilst user input is clearly a key determinant in both types of virtual environments, socially oriented virtual worlds provide more autonomy and flexibility to their users. A relatively comprehensive definition for socially oriented virtual environments comes from Spence (2008), suggesting that virtual worlds are persistent, synthetic, 3D, non-game centric and primarily social spaces, which motivate their users to engage in a diverse set of social interactions as well as to create different types of virtual content.

Although slight deviations across different definitions of a given construct are quite commonplace, these discrepancies are particularly understandable in the case of relatively novel, dynamic and interdisciplinary concepts, such as those associated with virtual worlds. In line with the variety of available working definitions, it is important to note that scholars tend to vary in their views and specific considerations in reference to virtual settings (Bell, 2008). For some scholars, the notion of virtual worlds comprises exclusively of socially oriented environments, whilst for others, the expression is treated more in the sense of an *umbrella* term, incorporating various types of settings as if they were relatively equal to one another (e.g. Axelsson and Regan, 2006; Schroeder, 2008). Regardless of the approach chosen or favoured, it is important to identify the particular definition guiding each scholarly work, in order to align the conclusions and potential generalizations accordingly. For the purposes of the current article, the definition generated by Spence (2008) will be used as the primary guide; especially given the above-mentioned extent of flexibility inherent in socially oriented virtual environments and their correspondingly enhanced relevance for identity formation. Nevertheless, when appropriate, references will be made to game-oriented virtual settings as well.

Aspects of identity

The notion of identity holds an extensively explored and colourful history in the social sciences. Since the pioneering and foundational work of Erik Erikson regarding identity development in the 1950s (see also Erikson, 1959), the traditional meaning of *identity* has been expanded, recognizing the influence of various societal and cultural changes, intertwined with the impact of globalization and recent technological innovations (e.g. Stryker and Burke, 2000). In the most general sense, identity captures the implicit and explicit responses to the question *Who am I*, encompassing a wide range of content and processes (Leary et al., 1986). Identity development is believed to proceed through certain predictable stages, continuously incorporating input and feedback from the environment (Marcia, 1966). Based on the available theoretical frameworks, four distinct levels of identity can be distinguished, including the individual, relational, social and material identities (Vignoles et al., 2011). Each of these *levels* represent different content and contextual elements and can be characterized by distinctive processes underlying the construction, maintenance as well as modification associated with the given identity.

Individual identity – also referred to as personal identity – comprises a set of relatively stable characteristics that individuals ascribe to themselves (Hagger and Chatzisarantis, 2006). Individual identity can be thought of as a vehicle through which one can build his or her global life story

(McAdams, 2006), incorporating goals, beliefs and values (Marcia, 1966; Waterman, 1999). The next level, relational identity refers to those roles that manifest themselves through various social interactions (Bamberg, 2004), placing particular emphasis on the importance of social feedback (Swann, 2005). Within the framework of social identity, the self-concept of individuals tends to be largely determined by their perceived membership in various social groups, including those associated with ethnicity, nationality, religion, gender and family (Segal, 2010; Tajfel, 1981; Taylor, 1997). In order to maintain their sense of self, individuals are motivated to conform to certain group norms and expectations (see also Goffman, 1969). Finally, material identity reflects the material extension of the self (Mittal, 2006), referencing the extent to which humans view certain material artefacts, such as clothes, cars and even places, as natural elements associated with their identities (Belk, 1988).

Prior to the current digital era, identity development used to be confined by the physical realities and constraints of the *here* and *now*, as well as by the need to build on the relatively limited collection of one's earlier experiences (Webb, 2001). According to Mann (1991), *reflexivity* plays a crucial role in achieving a general sense of self and identity, which under offline conditions is related to the physical world in which humans exist. The emergence of virtual environments, however, opened the door for users to experience various virtual encounters, many of which would not be feasible or possible in the purely physical real world (Yee et al., 2011). Whilst the notion of identity represents a core building block for a variety of theories in the field of psychology, and has also been widely referenced in other disciplines, potential theoretical models that reflect upon virtual world presence and incorporate the formation and stability of identity in online settings have not yet emerged. In the next section, we highlight some of the particularities of identity development that are specific to virtual settings and begin to elaborate on the notion of virtual identity.

Virtual identity

We live in an era in which technology has the potential to blur the boundaries between reality and fantasy, or *the real* and *the virtual* (Marsh, 2010). Through their avatars and associated profiles, virtual world residents can establish their virtual identities, which can be moulded according to their desires and expectations. No longer confined by the physical realities and existential limitations, virtual environments provide individuals with a *clean slate* onto which to construct their desired virtual identities (Kennedy, 2006; Turkle, 1994), offering radically new possibilities for *identity redefinition* and *self-recreation* (Matviyenko, 2010; Riberio, 2009; Turkle, 1995). Amongst other aspects, taking advantage of their freedom and relying on their own resources, users can establish and enhance a unique identity for themselves, utilizing a variety of symbolic materials available (Clothier, 2005; Tubella, 2005). Within this framework, it is no longer sufficient to think about identity construction or identity development solely in the traditional sense, in reference to the real physical world. Instead, in the case of virtual world residents, the central question of *Who am I?* needs to be divided into two segments; one addressing the *real self* and the other addressing the *virtual self*. Furthermore, these two selves should not be considered distinct entities but rather ones that encapsulate different aspect of an individual's personality (Jerry and Tavares-James, 2012).

Beyond the concept of immersion associated with virtual environments, there are further particularities that are worth mentioning, in order to understand the participation and corresponding existence of individuals in virtual settings more fully. First, virtual worlds are immersive 3D environments (Baños et al., 2004) and as such are able to induce a stronger sensation of presence

when compared with those virtual communities that are based on two-dimensional technology (Pan et al., 2006). Second, users in virtual worlds can engage in real-time and synchronous interactions. Similar to our concept of time in offline settings, time in a virtual world cannot be paused, yielding the notion of persistence. Third, it has been suggested that one of the functions of a virtual world is to provide a specific *third place* – a notion originally coined by Oldenburg (2000), where individuals can interact with each other in a supportive and relaxing fashion (Ducheneaut et al., 2007; Steinkuehler and Williams, 2006).

These so-called *third places* are not equivalent to online games or social networking sites. Instead, they are specific virtual environments that differ from one's home or work and serve as neutral grounds for socializing and experiencing realities that tend to diverge from those in real-life settings (Halvorson, 2010). Finally, virtual worlds serve as platforms where users can *embody* their virtual selves (Biocca, 1997) and feel that they are really *present* in the given environment (Biocca et al., 2003). This latter point is particularly important from a psychological standpoint, as by immersing themselves in virtual worlds, users gain the opportunity to experiment with their virtual self-representations and self-extensions (Mennecke et al., 2011). In this sense, users do not consider their avatars as artificial entities, but instead view them as living units (Bélisle and Bodur, 2010).

Interestingly, despite the vast presence of individuals around the world in online virtual environments (Messinger et al., 2009), there is no existing model of virtual identity in the contemporary literature; one that addresses theoretical considerations and provides a base for future empirical exploration. In the next section, we turn to introduce our proposed conceptual framework, utilizing the above-mentioned *four aspects identity model* as a starting point for laying down the structural elements. This model provides a particularly good base for virtual extension for the following reasons: on the one hand, it is a comprehensive multidisciplinary framework, encompassing individual as well as global elements. On the other hand, it recognizes the internal as well as external factors that are likely to play a role in identity development in any setting.

The conceptual model of virtual identity

Building on the four aspects identity model established in offline environments, our conceptual framework presented in Figure 1 encompasses three layers, comprising the individual, the micro-level and the macro-level. These levels are portrayed as different structural elements that jointly contribute to the establishment of virtual identity.

When an individual user decides to establish a virtual presence and with it inadvertently assumes a virtual identity, he or she has to make a variety of decisions throughout the process of avatar and profile creation. This endeavour, as mentioned above, is characterized by a great deal of flexibility and choice. Similarly to real-life identity development, virtual identity construction can be described as a cyclical and continuously iterative process, simultaneously influenced by a variety of individual and global or community-based factors within certain environment-specific realities. In this sense, virtual identity is best considered as a continually evolving incremental system within a synthetic virtual environment. In light of this complexity, and building on the four aspects identity model outlined above, our conceptual framework incorporates the personal, relational, social and material orientations. Additionally, our model distinguishes between three additional levels, differentiated by their position along a theoretical continuum that captures aspects from the individual to the global, with each layer contributing to the puzzle of virtual identity with different structural and functional elements.

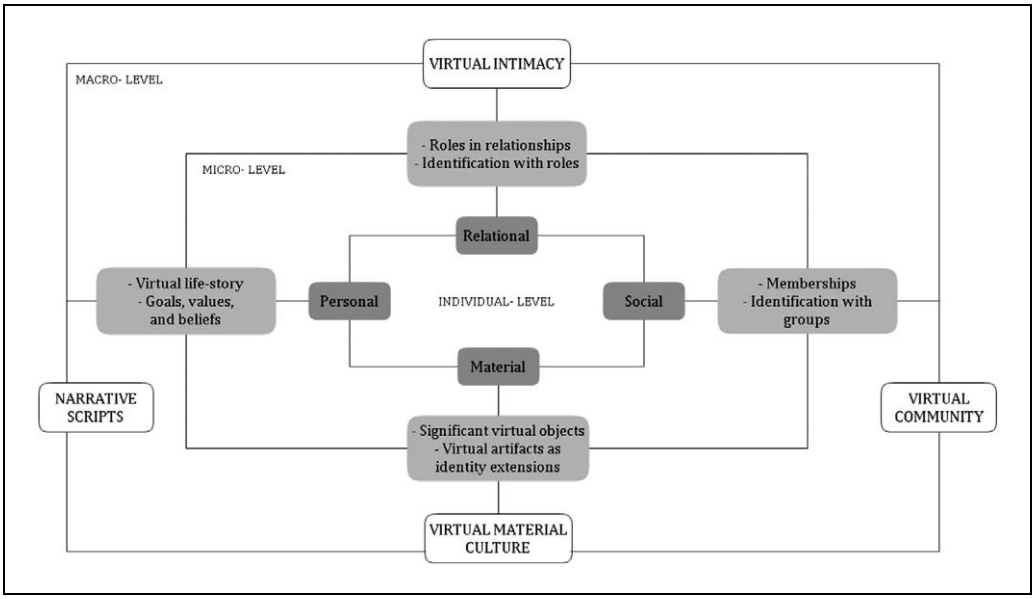

Figure 1. The conceptual structural model of virtual identity.

As a general overview, depending on the level under investigation, we emphasize slightly different aspects of identity development. As we intend to analyse this process starting with the individual, our review will progress from the personal towards the global level. Within the individual level, we highlight those elements that distinguish one individual from another in terms of virtual identity creation. Within the micro-level, we review ways in which the different identity orientations are manifested, enabling individuals to further immerse themselves into the virtual environment. Finally, within the macro-level, we explore the community-wide elements that are moulded by the collective user pool and in turn shape and modify each individual's virtual identity. In the following sections, we review and discuss relevant particularities associated with each of the three levels separately, incorporating previous empirical studies and relevant findings from the available literature.

The individual level – The avatars

Avatars play a central role in achieving a sense of identity for those wishing to enter a virtual environment and will remain meaningful, particularly as individuals become increasingly immersed (Gorini et al., 2011). Those virtual environments that integrate contextualized narrative elements to a greater extent tend to generate more intense emotional responses, which in turn tend to evoke a stronger sense of inner presence. In their early study focusing on a collaborative virtual environment, Talamo and Ligorio (2001) argued that virtual identity construction, for which they used the term *cyber identity*, relies on multiple processes of identity conceptualization, with the evolving identity manifested through the avatars. Avatars can be thought of as the *vehicles* used to communicate with other residents and in a sense can be considered as embodied conceptions of the users' self. The resulting intimacy has been reflected in several prior studies. For

example, according to Taylor (2002: 52) '[. . .] the act of creating an avatar is to a large extent focused on getting to the "*that is me*" stage'. Furthermore, the strong emotional and cognitive bond between the identity and the avatar can be captured by certain linguistic markers (e.g. '*I* was attacked by a monster' or '*I* had a great time in Second Life') as well as by various behavioural correlates (Yee et al., 2011). Powers (2003) refers to this unique relationship between individuals and their avatars by the term *avatar attachment*, a notion that tends to be mediated by the sense of presence, identity and communication.

Similarly to real life, virtual identities are created and positioned through communication and tend to be context dependent. Virtual worlds, especially Second Life, possess unique characteristics that encourage their users to form relationships with each other (Becerra and Stutts, 2008) and provide various opportunities for cooperating with other users within the community (Fetscherin and Lattemann, 2007). Via the creation of their avatars, participants simultaneously define their own personal space and boundaries as well (Wolfendale, 2007). In this respect, physical proximity between avatars may have a symbolic meaning associated with intimacy, friendship and social bonds, similarly to individuals' offline existence (Taylor, 2002). The extent of congruence between virtual identity and real-life personality continues to be an open question, with no definite answer to date. Previous reports document an apparent variation across individuals in terms of their virtual self-representations, with some presenting their actual selves, whereas others presenting their ideal selves (Koles and Nagy, 2012; Sung and Moon, 2011). This variation has also been associated with different subsequent experiences in virtual environments. More specifically, those users who reflect more upon their ideal selves throughout their avatar formation process also report greater perceived interactivity, when compared with those users who are more likely to reflect upon their actual selves (Jin, 2010).

A variety of motivational aspects require further consideration in order to understand virtual experience more fully, with certain drivers given more importance over others (Hsu and Lu, 2004; Kallio et al., 2011; Jeng and Teng, 2008; Teng, 2008). The main drivers characterizing virtual worlds tend to include arousal, pleasure and individuation, whilst certain others, including gender, affinity for technology and channel intensity, appear to be rated with less importance (Barnes and Pressey, 2011). In addition, further motivations have been identified as important in online game playing, including escapism (Mathwick & Rigdon, 2004), power and control (Hinsch and Bloch, 2009) and social needs (Castranova, 2004; Messinger et al., 2008; Nowak and Biocca, 2003; Yee, 2006). Finally, Messinger and his colleagues (2009) suggest that virtual consumption should also be considered as an important driver, influencing personal and virtual social behaviour, as well as the general process of avatar construction.

With respect to our conceptual model, the above-mentioned findings have a variety of implications for virtual identity construction. First, the personal dimensions of one's virtual identity can be characterized by a sense of presence ('*It is me* participating in the given virtual world') and by the notion of avatar attachment ('*It is me* experiencing certain things in the given virtual world') (Trepte and Reinecke, 2010). In other words, participating in virtual worlds means having to construct one's virtual body and avatar and also to define one's own personal space. Second, relationships formed with other users – whether romantic or friendly in nature – may have an additional impact on establishing virtual identities, in line with the relevance of the relational identity orientation. Third, decisions associated with becoming members of certain virtual communities, such as belonging to a certain gender or race, or to those groups defined by special interests, tend to enrich the social dimensions of virtual identity. Finally, through the consumption of virtual goods and associated preferences, the material dimensions of virtual identities are likely to be enhanced and fine-tuned.

Regardless of the extent of immersion and avatar attachment, the process of avatar creation will inherently reflect upon the value system, goals and beliefs of a given user, either by consistently mirroring his or her real self or by expanding beyond it in order to achieve his or her ideal self. The primary drivers associated with virtual existence point to the relevance of more individual-centred and hedonistic aspects, emphasizing the degree of flexibility and choice characterizing virtual identity, particularly in comparison with real-life identity. These elements will be revisited and further elaborated upon when discussing the other levels of the conceptual framework.

The micro-level – the connection

The next stage in our conceptual model of identity development, the micro-level, represents those elements that serve as the link between the individual user and the global community. The particular components, namely narrative scripts, virtual intimacy, virtual community and virtual material culture, have emerged and been identified as the primary factors and will be discussed separately. In our descriptions, the terminology used to reference the four component blocks coincide with those used for the macro-level, reflecting upon the notion of continuum, ranging from the more personal to the more global and community-wide aspects.

Narrative scripts encompass virtual life stories and are manifested through those individual or collective goals, values and beliefs that in some way are embedded in an individual's virtual existence (Albrechtslund, 2010; Dickey, 2011). Narrative elements tend to be based on specific experiences that relate to a certain person, take place in a specific virtual world and become crystallized through various virtual activities, such as socializing in the case of Second Life (Bardzell and Odom, 2008) or gaining a certain reputation in the case of World of Warcraft (Bainbridge, 2010). These experiences can be viewed as sequences that when joined together form a narrative structure (Albrechtslund, 2010).

Virtual intimacy captures the particular roles assumed by individuals, along with the extent to which they identify with these roles. In general, roles can be viewed as 'sets of behavioural expectations associated with given positions in the social structure' (Ebaugh, 1988: 18). In this respect, roles serve as the fundamental building blocks associated with a particular community or special interest group, with the specific meaning assumed by a role embedded in the bigger social environment (Stryker and Statham, 1985). For instance, in World of Warcraft, the role of a guild master would be meaningless without the complementary role of being a guild member. Some of these roles tend to be predetermined, either by being inherently associated with a specific character, like in the above example, or by relating to a particular group membership. Other roles, however, are not predetermined, such as a friendship between two avatars, and thus entail more flexibility.

Importantly, individuals may render different meanings to their roles and relationships, which in turn may affect their level of associated intimacy. In general, relational identification refers to the extent of one's self-definition with a specific role (Sluss and Ashforth, 2007), usually involving self-expansion (Aron et al., 2000) and often self-enhancement (Aron and McLaughlin-Volpe, 2001). For example, Second Life residents can engage in different role-based activities, such as being a good friend or a romantic partner, in turn building on the individuals' (virtual) relational identity orientation. From this perspective, game-oriented and socially oriented virtual worlds differ from one another. Whilst both settings tend to include a combination of predetermined and voluntarily assumed roles, with their strict rules imposed, game-oriented virtual environments tend to have more of the former, whereas with their increased flexibility, socially oriented virtual

environments tend to have more of the latter types, with corresponding implications for virtual identity (Spence, 2008).

Virtual community refers to group memberships and overall group identification. Group membership in virtual worlds is considered to serve as the primary gateway to belonging to a larger community (Riberio, 2009). As Steinkuehler (2006) points out, virtual communities function as an important mechanism of enculturation for those who participate in them by providing social feedback and a sense of belonging (Taylor, 2006), in turn helping to shape and maintain the social aspects of a virtual identity. Correspondingly, users need to learn and adapt to specific cultural norms in order to develop social bonds with other individuals (Blodgett and Tapia, 2011; Dickey, 2011). For instance, World of Warcraft users can join guilds or form troupes where they can gain titles or ranks, whilst users in Second Life can join multiple groups based on their interests or hobbies.

In order to become a functional member of a given virtual community, an individual has to achieve social identification, and in turn should begin to perceive him or herself as one with the group. Through this process of identification (Whitty et al., 2011), and through subsequent communication and interactions, members learn a variety of social rules and important norms and gain further knowledge about various virtual endeavours (Williams et al., 2006), such as cooperating with other characters in World of Warcraft (Bainbridge, 2010) or creating certain virtual contents in Second Life (Lowood, 2011).

Finally, *virtual material culture* incorporates those objects and artefacts that are significant enough to be viewed as identity extensions. The consumption of virtual goods, such as clothing or weaponry, enables users to further immerse themselves in a virtual world (Nojima, 2007). According to Lehdonvirta (2009), purchasing virtual goods is based on various motivations, including self-expression, as well as hedonic and social needs, emphasizing the subjectivity associated with virtual objects. In fact, virtual objects may be used to achieve a certain status or gain popularity among other avatars. Furthermore, depending on individual preferences and interests, certain users may value particular virtual objects that may not be as important for others (Drennan and Keeffe, 2007).

Along these lines, Hamari and Lehdonvirta (2010) argue that the symbolic and real value of a virtual item is created *jointly* by the users and the virtual environment, supporting the element of continuum in our conceptual framework. In other words, virtual objects may have different meanings for different users; nonetheless, the value of a virtual item is largely determined by the virtual community and by certain predefined attributes associated with a given virtual world. Therefore, whilst the significance of a virtual object relies on both the environment and user perception, only those artefacts that are consistent with an individual's virtual identity have the potential to yield identity extension.

The macro-level – the virtual community

Building on the previous two levels, we arrive at the macro-level of our conceptual framework, encompassing elements that pertain to the more global community of a virtual society. In a sense, this level would have served as a realistic alternative starting point to our present analysis, going from the global outer scale to the individual inner scale. We chose the opposite direction in order to emphasize that the duality between flexibility and complexity, characterizing the process of avatar creation, prevails throughout the entire analysis. However, it is important to emphasize that virtual identity could not have been built without certain guidelines and expectations that

are consistent with the more global and holistic structure, the elements we are going to review subsequently.

In a community sense, *narrative scripts* refer to those narrative elements of virtual identity that are determined by the characteristics of virtual worlds and are supplemented by the user's choice. With respect to identity development in real-life settings, narrative identity can be defined as the internalized, evolving story of the self that each individual creates in order to fill his or her life with certain purpose and sense of unity (e.g. Laszlo, 2008; McAdams, 2001; McAdams & Olson, 2010). Narrative identity represents the global part of personality that can be distinguished from one's broader dispositional traits as well as contextualized characteristic adaptations (McAdams, 1995). Whilst this definition may provide a useful starting point to understanding virtual identity, we should note that in contrast to real life, virtual worlds apply different rules and fantasy-based elements that impact the user experience and associated virtual identity. On the one hand, game-oriented virtual worlds have strict rules and provide predetermined, but nonetheless complex fantasy-based storylines, which together influence identity formation. On the other hand, socially oriented virtual worlds have minimal rules and thus provide nearly unlimited freedom to form unique virtual identities. In other words, the innate characteristics of virtual worlds play an important part in determining the narratives that are available for their users.

Virtual intimacy refers to the extent of willingness or desire to initiate and maintain intimate relationships amongst the residents of a particular virtual world. In addition to the mere notion of availability as set forth by the creators of virtual environments and those active in building and enhancing the community, virtual intimacy also reflects upon the users' own preferences, choices and desires regarding the formation of close and deep connections. To date, only a few empirical investigations have been conducted to explore intimate relationships in virtual worlds. In a recent study comparing intimate relationships taking place in real life as opposed to in virtual settings, the researchers found that individuals tended to report more delightful communication patterns as well as higher levels of satisfaction in their virtual intimate relationships (Gilbert et al., 2011a). According to Scott and his colleagues (2006), individuals often turn to virtual relationships after having experienced certain obstacles in their real-life associations. Furthermore, Gilbert and colleagues (2011b) argue that individuals view their virtual relationships as *real* relationships, as opposed to some form of game playing in Second Life. The authors also highlight that the users of this virtual environment find the personality of their virtual partners more positive and entertaining than that of their real-life partners.

Virtual community refers to the collection of virtual groups that represent themselves in a particular virtual world. As mentioned before, virtual groups are important, given their impact on virtual identity formation through social feedback. In the real world, social influences on identity formation are essential factors to maintain an integrated sense of self (see also Gergen, 1991; Goffman, 1969). However, whilst social influences are also considered to be the cornerstones of virtual identity formation (Solomon and Wood, 2008), we need to recognize that virtual communities are different from real ones in certain fundamental ways. In the case of game-oriented virtual worlds, the community provides fantasy settings along with special groups or tribes, such as *guilds* in World of Warcraft. In the case of socially oriented virtual worlds, virtual groups may include a whole spectrum of social communities ranging from fantasy-based (e.g. furries or vampires) to realistic groups (e.g. students or club goers). Besides being members of specific virtual groups, the social aspects of virtual identity can be further fine-tuned by the choices users make with respect to gender, nationality or virtual family (Bainbridge, 2010).

Finally, *virtual material culture* refers to the relationship between virtual artefacts and virtual social relations. In the real world, individuals can establish a certain social standing via obtaining various material possessions (Slater, 1997) and have been shown to render specific meaning to material objects (Wallendorf and Arnould, 1988; Wattanasuvan, 2005). According to Lehdonvirta (2010), virtual worlds have developed fairly sophisticated material cultures, with their users appropriating virtual goods for functional as well as symbolic uses. In addition, research has revealed that individuals consume virtual goods for reasons that are similar to their consumption of material goods in real life. For instance, they may seek certain material items in order to become members of certain groups, to establish and express particular identities or to find resolutions to relevant problems (Landay, 2008; Lehdonvirta et al., 2009; Martin, 2008). As a specific example, in order to enhance their avatars, Second Life residents may buy clothing and other virtual objects using Linden Dollars, whilst users of World of Warcraft may purchase virtual weapons or armours in exchange for gold.

Conclusion

The purpose of this article was to present a theoretical framework for virtual identity development within the context of game-oriented and socially oriented virtual environments. Our proposed model presents virtual identity as a multidimensional concept encompassing three levels, all of which simultaneously and continuously impact one another, and are responsible for the evolution of this dynamic entity. The model implies that virtual identity construction is based on various macro-level or community-based factors, including narrative scripts, virtual intimacy, virtual community and virtual material culture. These elements are mediated by those identity-related manifestations that occur on the micro-level, responsible for the acculturation of particular individuals to a given virtual society. The personal-level attributes that are shaped by certain predetermined or voluntary rules inherent in the given community, and in turn also continuously shape the environment, further highlight the dynamic and multidimensional nature of virtual identity.

By presenting virtual identity as a complex entity, our article may assist professionals as well as practitioners desiring to gain a more complete understanding of this particular concept. The comprehensive nature of the current model expands previous research that focused exclusively on certain aspects of virtual identity, such as the social or material ones (e.g. Drennan and Keeffe, 2007; Lehdonvirta, 2010), without taking into consideration other elements, like the individual dimensions of the virtual self. Users do not only create specific virtual identities for themselves but also project their fantasies and aspirations on their ideal selves to these digital entities. Therefore, in order to understand the complex meanings of virtual identity, one needs to disentangle the multifaceted layers inherent in this concept.

Our model highlights several important elements of virtual identity that may inspire future research in a variety of ways. On the one hand, in an era of sophisticated self-tracking systems, virtual environments may offer profound opportunities to measure and even quantify identity and the human self (Veerapen, 2013). More specifically, Swan argues that

> Since most humans are not good at thinking statistically (i.e., quantitatively), but are good at thinking in stories (i.e., qualitatively), some of the most effective QS [Quantified Self] devices could be those that include dimensions of both, for example, that have quantitative accuracy and qualitative meaning-making functionality (2013: 94).

By monitoring one's virtual identity construction tendencies and associated online behaviours, researchers may be able to analyse and more fully understand the online human self, with particular attention to the individual, micro and macro dimensions.

On the other hand, by studying virtual identity, scholars may also gain a better understanding of users' offline selves and corresponding characteristics (Suh, 2013). Previous research found that certain personality traits, such as introversion, self-esteem and gender play a substantial role in the virtual self-construction practices (Dunn and Guadagno, 2012) and preferred online behaviours of individuals (Guadagno et al., 2011). Therefore, by building on our conceptual model, researchers can analyse offline and online personality variations amongst virtual world users, with particular attention to their individual as well as social manifestations. Nonetheless, further research is necessary to explore the ways in which individuals' offline attributes influence their virtual identity construction tendencies on different levels of the conceptual analysis.

In summary, the main contribution of the current work comes from its multidimensional and holistic approach, expanding beyond prior work that observed virtual environments from a predominantly social perspective. It is clear from the current analysis that the various structural elements that derive from concepts *other than* those associated with social encounters are important and thus should be taken into consideration. Our increased understanding of virtual identity is relevant, given the rapid spread of virtual environments, and their multifaceted implications for a variety of disciplines and theory formations, from the perspective of academics and practitioners alike. The current framework may serve as a base for researchers interested in conducting empirical analyses in virtual settings and contribute to the literature with its attempts to further disentangle the complex concept of virtual identity.

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