



ERASMUS UNIVERSITY ROTTERDAM

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- Master Thesis -

**VIRTUAL WORLD:
IMMERSION or AUGMENTATION**

-

**A netnographic and empirical research over the
impact of trust, identity and technology's success on
the virtual world's overall success**

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Dedicated to the loving memory of my father

ABSTRACT

This study proposes an innovative approach for studying virtual worlds' success that accounts for the dual nature of the virtual environment. Immersionists consider the virtual world a separate *place* while augmentationists see it as a *tool* and as an extension of real world. In this perspective, I built a model that investigates to what extent virtual worlds' success is driven by trust, identity and the success of the technology developed to support the digital world (i.e. the platform). For the analysis, I used a netnography to help testing the model and validate the theoretical constructs. Furthermore a survey is performed. The results show evidence that trust as well as technology's success jointly drive the overall success of the virtual world considered as a place and a tool. Failing to differentiate the two conceptions of virtual worlds has important implications on the model's constructs and explanatory power.

INDEX

1. Introduction	1
1.1. Context of the research and problem definition	1
1.2. Relevance of the subject and research objectives	4
1.3. Structure of the thesis	6
2. Virtual worlds	7
2.1. Knowledge sharing	9
2.2. Social capital	10
3. Literature review and hypotheses	12
3.1. Success of the virtual world (DV)	12
3.2. Conceptual model	12
3.3. Success of the virtual world as a technology (VW's Use)	14
3.3.1. Amended Seddon Model	15
3.4. Trust	16
3.4.1. Generalized trust and particularistic trust	17
3.5. Identity	18
3.5.1. Motivations behind identity's choice	18
3.5.2. Acceptance of the proposed identity	21
3.5.3. Exposure to supplementary personal details	23
4. Methodology	25
4.1. Netnography: Forums and residents' blogs	26
4.2. Residents' survey	27
4.2.1. Measures	28
4.2.2. Data Analysis	30
5. Results	32
5.1. Discussion	39

6. Conclusions	42
6.1. Limitations and future research	44
References	47
Appendix	
Questionnaire 1	I
Questionnaire 2	V

1. INTRODUCTION

1.1. CONTEXT OF THE RESEARCH AND PROBLEM DEFINITION

Virtual worlds (VWs) are multi-user online simulated virtual environments, allowing for the highest degree of interaction, where the user is represented by an avatar, 3D representation of the self. Individuals create a presence in virtual worlds for a variety of reasons: socialization, cooperation with others, content creation, entrepreneurship, learning, entertainment, etc. Nonetheless, virtual environments are ideal places for self-exploration, discovery and development (Joinson, 2003). Anonymity is an important characteristic of virtual worlds because it allows people to unveil and test new aspects of their personality without fearing any repercussion on their real identity. Anonymity leads to deindividuation that consequently reduces inhibitions (Kiesler & Sproull, 1992).

This paper focuses on Second Life¹, a virtual world platform run by Linden Lab and operating since 2003. Second Life (SL) is the most popular virtual world and the only one with a real economy where Linden Dollars (L\$) are exchanged on the LindeX currency exchange. Nowadays SL counts² 31,140,150 residents, with a mean of 48,178.8 online members a day and 999,101 residents logged-in during a month period. Second Life's population consists mainly of innovators and early adopters: the complexity of the platform and the skills required are still detrimental for a broader adoption. Second Life's users enjoy a great deal of freedom, which enhances immersion and creativity, but also exposes the community to harassment, deception, vandalism, privacy and security issues. Linden Lab does not exert rigid centralized governance, instead it outlines basic general rules of conduct and behavior through the Terms of Service and Community Standards, and furthermore, it encourages residents to actively engage in the community governance to guarantee the respect of rules and norms of the virtual society.

Second Life attracted great attention in its initial phase: media, users, entrepreneurs, companies, educational institutions, governments were seeking the potential opportunities this tool could disclose, but nobody knew whether it was going to be a success or a fad. Many companies, fearing to lag behind competition or in the spirit of innovativeness, rushed to create a presence in the virtual world. Shortly thereafter, several of these companies left the nascent market because they failed to create a rewarding presence in it. American Apparel left

¹ Second Life, SL, Linden Lab, LindeX, Linden dollars are trademarks of Linden Research, Inc.

² Source: <http://gridsurvey.com/economy.php> statistics for total residents updated on the 10th October 2012, those regarding the daily and monthly mean login stats on the 26th June 2012.

the market after one year of in-world presence because investments were not paying off as at the time of the hype's pick, when impressive media coverage was assuring visibility (source BBC News, November 2009³). T-Mobile and Vodafone left to save money because they could not find a valuable way to monetize on their virtual presence (source The Telegraph, March 2009⁴). Piskorski (2011) claims that the reason behind such failures, lies in the fact that these companies simply attempted to replicate the physical company in the virtual world, by focusing on their business goals instead of concentrating on customers' unmet social needs. Socialization is what people look for in virtual environments, therefore by helping customers in their objective, companies will ultimately benefit by gaining a glimpse on unmet needs and by strengthening the bond with them.

An additional interpretation of the virtual words' downturn is provided by the Gartner Hype Cycle of the most important emerging technologies (figure 1, source Forbes 2012⁵).

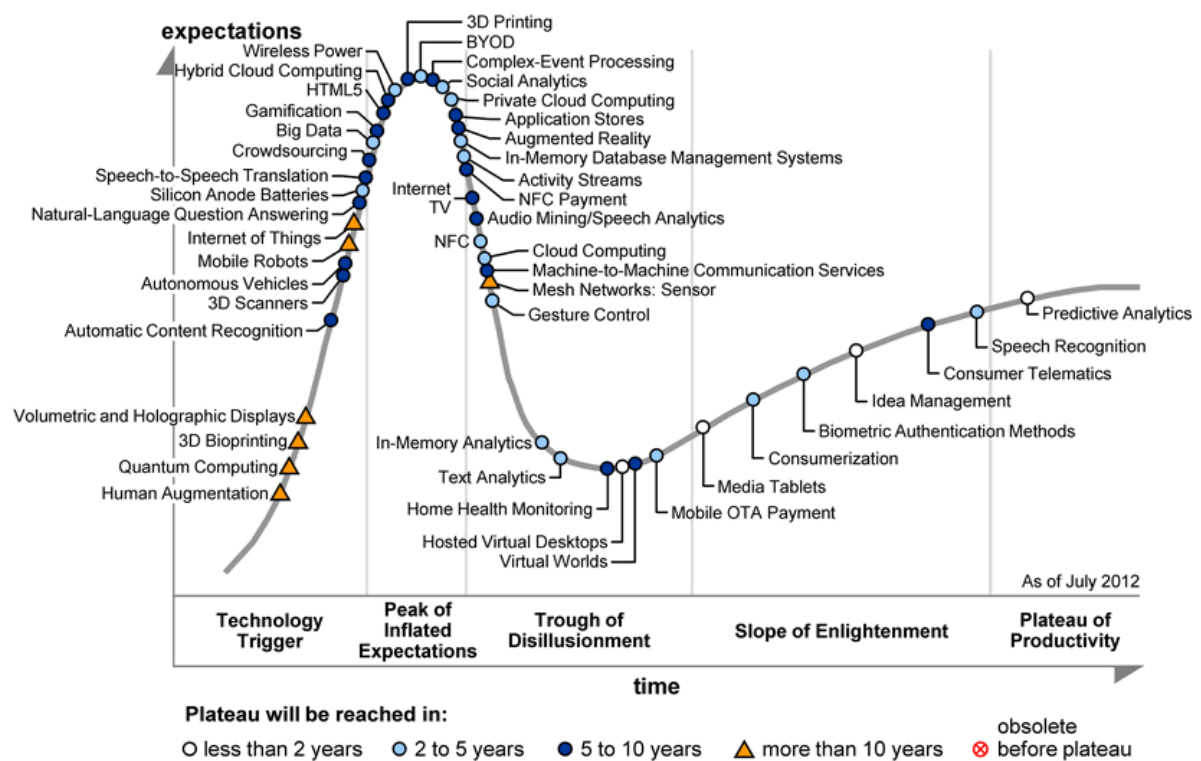


Figure 1: Gartner Hype Cycle for emerging technologies, 2012

³ Retrieved on the 2nd November 2012 from: <http://news.bbc.co.uk/2/hi/8367957.stm>

⁴ Retrieved on the 2nd November 2012 from: <http://www.telegraph.co.uk/technology/5078444/Second-Lifespan-is-virtually-over-as-firms-decide-to-get-real.html>

⁵ Retrieved on the 2nd of November 2012 from: <http://www.forbes.com/sites/gartnergroup/2012/09/18/key-trends-to-watch-in-gartner-2012-emerging-technologies-hype-cycle-2/>

The Gartner Hype Cycle provides insights on the maturity stage of new technologies and their future direction, a valuable guidance for businesses that seek the most beneficial moment to step in a specific new technology (source Gartner⁶). The Gartner Hype Cycle delineates five phases in the life cycle of an emerging technology according to the maturity stage and the expectations' level. Regarding virtual worlds and Second Life in particular, the media mainstream interest and coverage started to build during the Technology Trigger phase and intensified during the Peak of Inflated Expectations. Driven by high expectations and enthusiasm, many companies decided to move in the new technology, profiting from free publicity of media stories. As long as the hype started to fade in the Trough of Disillusionment, numerous companies left the new technology because it failed to meet their expectations. Also the media coverage vanished. Other companies remained in-world in order to gain a deeper understanding of the new technology and the potential business opportunities. BMW, for example, had a presence in Second Life for two years to understand and explore the virtual world and its opportunities⁷. However, even though BMW was optimistic about the future of Second Life and its potentials, it left Second Life in July 2008, because the user base was not adequate for their marketing purposes and the platform was not ready to fulfill the companies' objectives⁸.

In the Hype Cycle's update of August 2012, Gartner revised the positioning of virtual worlds moving them from the Trough of Disillusionment stage to the beginning of the Slope of Enlightenment, forecasting a 5-10 years' time period to reach the Plateau of Productivity phase. Gartner describe the Slope of Enlightenment, as a stage in which some companies begin to understand the benefits and possible applications of the new technology. Finally, the Plateau of Productivity is reached with the mainstream adoption of the new technology. Moreover the benefits of the technology are widely visible and accepted by the market.

Virtual worlds have reached an important turning point in their life cycle, however to harness the potential of virtual worlds, it is important to first comprehend the challenges and changes the new environment poses in comparison to what we are generally accustomed. Which are the drivers of the success of virtual worlds? Are these success' drivers simply related to the performance of the technology or are they related also to the way the new technology mediates and influences social interactions' development?

⁶ Retrieved on the 2nd of November 2012 from:

<http://www.gartner.com/technology/research/methodologies/hype-cycle.jsp>

⁷ Retrieved on the 2nd November 2012 from: <http://www.beatenetworks.com/blog/index.php/?archives/372-BMW-Leaving-Second-Life.html>

⁸ Retrieved on the 2nd November 2012 from: <http://zeezeit.blogspot.de/>

Before entering a new market, companies need to understand its culture and uses in order to position themselves in a way which is consistent with the new customer base. To understand customers' unmet needs it is essential to make a step back and analyze who are the new customers in a virtual environment where individuals are represented by avatars, with imaginary names and appearances that may or may not recall the real personas' behind them. To understand what characterizes the new customers there are a few questions we need to answer. What leads individuals in a virtual world? How does the new environment influence the user and the interactions among individuals? How does trust develop in case of anonymity? Who should the company address: the virtual persona or the real one behind it?

1.2. RELEVANCE OF THE SUBJECT AND RESEARCH OBJECTIVES

A virtual world is not simply a new media or tool aimed at encouraging socialization and cooperation online, it represents an advanced translation of real society into virtual reality, benefiting from cultural and geographical spanning. Reeves and Nass (1996) found that individuals unconsciously equal media to real life and, media experiences to human experiences: people "accept what seems to be real as in fact real" (p.8, 1996). After initially acting like an amplifying tool facilitating habitual tasks, a technology takes on a transformative role that influence psychological processes, personal views, social interactions and roles (Kiesler, 1997). Such premises unveil the relevance and potentials of virtual worlds in social, economic and educational terms.

To harness the potentials of virtual worlds, it is important to analyze the fundamental factor facilitating social interactions in a context dictated by uncertainty, namely trust. Blau (2002) argues that human relations in modern complex societies depend on "reciprocated choices between erstwhile strangers". However, there is no certainty that the social exchange between strangers will be reciprocated. Trust is a fundamental substitute in prompting the voluntary online collaboration between strangers and in guaranteeing the community continuity even when rules are deficient (Ridings, Gefen and Arinze, 2002) and information incomplete (Ba, 2001).

Trust has been investigated in many fields leading to a variety of definitions and concepts. In spite of the extensive literature about offline trust, the research on online trust has been limited and has targeted mainly virtual communities and trust in websites as enabling technologies. Virtual worlds pose a new perspective to the concept of trust. As with virtual communities, interactions and transactions with strangers are elicited, however in virtual

worlds, physical virtual presence and visual cues of actors and the shared environment are available, activating some dynamics of trust similar to real world. Social interactions in VWs follow the same social norms as in real life, even though users are represented by avatars controlled through a keyboard (Yee, Bailenson, Urbanek, Chang & Merget, 2007). In order to capture the duality of virtual worlds, both offline and online conceptualizations of trust are adopted.

What poses a threat to trust development is the lack of identifiability (Joinson, 2003): in Second Life people choose among a list of fictitious names when creating their avatar, breaking the link to reality. “You don’t know who is listening and you don’t necessarily know who people really are” (Prentice Steve, 2007). Identity remains an aspect difficult to verify online. In real life, the outlook of a person gives us clues about his personality and trustworthiness, but in Second Life the avatar’s appearance can either replicate closely the real person’s outlook or diverge to some degrees, if not completely, from it. The same happens with identity, how do we know whether the residents we encounter in the virtual environment are acting genuinely as the real persona they stand for or playing a role? There is not such a net distinction between real/virtual identities’ equality and role playing; moreover it does not necessarily mean that identities’ discrepancy has a negative impact on trust. Identity equality and role playing are simply the two extremes of a spectrum of possible occurrences. This paper aims at showing that different personal motivations lead to identity’s choice in a virtual world, furthermore this choice is interconnected to the purpose for creating a presence online. The relationships between identity’s choice and trust are investigated. When someone looks for a second chance to live a normal life in Second Life because of social or health problems, then trust is not compromised. On the other hand, when someone creates a second self just to role play and cheat others, this undermines trust and ultimately the future of the whole system.

Even when the factors defining trust and social dynamics in cyberspace are delineated, it is necessary to implement the usability of the new technology to reach its success and broader adoption. Beside the technical requirements demanded for granting a smooth virtual experience, Second Life appears complicated and fuzzy to a new user, which explains the high number of inactive accounts. Therefore to research virtual world’s overall success both social trust and the technology’s success are fundamental: the Amended Seddon Model will be adopted for this purpose. As soon as people will become familiar and less skeptical towards virtual worlds, they will grow in popularity unveiling their great potentials as essential tools for individuals, companies, governments and institutions. Let’s just think at the

possibility to use these new platforms as decision markets where, for instance, companies can test their innovations, organizations and governments can determine the consensus that a new policy or law may induce in the population, and further on. Virtual worlds are the perfect candidates for becoming the platform of the future to interact, communicate and cooperate without any boundaries.

1.3. STRUCTURE OF THE THESIS

An overview of the paper's structure is hereby provided. The second chapter offers a deep insight into the features of a virtual world. The peculiarities and advancements the new medium introduces permit an immersion with no antecedents. However a virtual world is not simply a new technology, it is also a society with its own culture. Therefore also the social characteristics will be explained: social network's structure, knowledge sharing and social capital.

The third chapter is dedicated to the research model and literature review. The outcome variable, namely the success of the virtual world is defined, followed by the conceptual model. The conceptual model aims at providing an overview of the relationships that are expected to be found between the dependent variable and the independent variables. Moreover it outlines the predictors of the independent variables. The theoretical background of the individual constructs and the hypotheses are then provided.

In the fourth chapter the qualitative and quantitative methodologies adopted are presented: namely the netnography and the residents' survey. The purpose for implementing the netnography in this paper is to help designing a model that applies to the specific online culture. The data collected from dedicated forums and blogs are used at all stages of this work in order to have a continuous validation and support of the assumptions. These continuous proofs appear in the form of anonymous quotations, for privacy and ethical reasons. The fourth chapter continues with the quantitative analysis and results discussion.

Finally, the fifth chapter is dedicated to the conclusions, limitations and future research.

2. VIRTUAL WORLDS

Originally, the Internet was characterized by static web pages and passive users. After the burst of the dot-com bubble at the end of 2001, the web has gone through a period of important transformations which are collected in the term Web 2.0 created in 2004 by O'Reilly Media⁹: a concept aimed at expressing a deep change and evolution of the Internet. The web becomes a user-centered platform for interaction, collaboration and information exchange where users are actively creating content. To facilitate cooperation and communication new applications and services emerge, to name a few: forums, blogs, chat, instant messaging, social networks and virtual worlds. Moreover, these new applications, allow users to create virtual communities, which are networks of people with similar interests, who connect and interact online through a certain communication tool (chat, IM, etc.), transcending any geographical boundaries (Pernar, 2007).

From now on, this paper will be focused specifically on virtual worlds, which are at the core of this research. Virtual worlds allow for the highest degree of interaction, they are multi-user online simulated virtual environments, where the user is represented by an avatar, 3D representation of the self. The setting can be a replication of the real world or it can be imaginary, often there is a fantasy theme. Virtual worlds find their origins in video games. Since the release of the first video game to the public in the early '60s (Boellstorff, 2008), the gaming industry has always been determined at creating the most realistic and immersive experience for players. Some of the milestones which have marked the evolution of videogames are so fundamental for the birth of virtual worlds that they became relevant elements of their definition. These are (Boellstorff, 2008):

- Persistence: by moving from personal computer installed games, to server-client based technology, the world existence no longer depends on the logging off of the single user, multiple players are now allowed to play simultaneously, interact with others and the environment as well. Even when no players are logged in, the virtual world is still alive.

- Synchronous: many people can be in-world simultaneously, they can interact together, communicate and create content. There is practically no delay in the exchange of information.

⁹ Retrieved in February 2007 from: <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>. O'Reilly Media Inc. is an American online observatory dedicated to the analysis, support and development of new technologies and networks.

Inter-player relations take place similarly to real life but with the mediation of a digital representation of the self.

- Place and sense of presence: improvements in computer graphics enabled the creation of extremely detailed and lifelike simulations, where the sense of distance is realistic. Through their avatars, users physically share simultaneously a Third Place (Krueger, 1991), a new dimension distinct from the actual world they can explore and co-create. Soukup (2006) argues that localization, accessibility and presence are fundamental characteristics of a virtual third place whose final objective is to promote social connectedness, reciprocity and trust. Residents experience not only their presence in this new virtual dimension, but also the copresence of others, it is more than being there, what counts is being there together (Schroeder, 2006). Furthermore passing from the *third-person perspective* of the early videogames character (external view on the character) to the *self-centric visuality* (avatar's eyesight), makes the experience truly immersive, the user feels embodied in his 3D representation (Boellstorff 2008).

Since the existing literature about virtual worlds was characterized by a multitude of conflicting definitions, there was a need for a shared notion that could set the basis for further research on the topic. Therefore the common definition of virtual worlds is adopted in this research: "A synchronous, persistent network of people, represented as avatars, facilitated by networked computers" (Bell, 2008). Virtual worlds can be goal oriented or social in nature. In the former category we find MMORPGs, massively multiplayer online role-playing games (e.g. World of Warcraft), the user has a goal to achieve and he improves his status as long as he advances in the game. Users can, not only enjoy an independent experience, but also team up with other players to reach some privileges and objectives faster. In the latter category, social virtual environments (e.g. Second Life), there is no record to track, it is mainly based on socializing, cooperating with others, content creation and the freedom to shape a new personal digital life. Further on in the text, the term virtual worlds will refer exclusively to social virtual worlds.

A virtual world is not merely a new medium, it is also a society. Wikipedia¹⁰ defines a society as "a large social grouping sharing the same geographical or *virtual territory*, subject to the same political authority and dominant cultural expectations. Human societies are

¹⁰ Retrieved on the 3rd of November 2012 from: <http://en.wikipedia.org/wiki/Society>

characterized by patterns of relationships (social relations) between individuals who share a *distinctive culture and institutions*. (...) as it is *collaborative*, a society can enable its members to benefit in ways that would not otherwise be possible on an individual basis; both individual and social (common) benefits can thus be distinguished”.

Hence, a virtual world is a society that groups together people with diverse geographical backgrounds, sharing the same virtual place, online culture and community governance. Socialization and collaboration drive users in-world and create individual and mutual benefits. Businesses have the opportunity to interact with heterogeneous networks of people and expose themselves to different opinions, ideas and points of view that can lead to innovations or ad hoc solutions for the new customers’ unmet needs.

Virtual worlds’ social networks possess the three characteristics that Surowiecki (2004) believes are fundamental for a heterogeneous group to come up with smarter solutions than few experts: diversity, independence, decentralization. The value of knowledge sharing resides in the non-redundancy of information that circulates. The above mentioned three characteristics create the conditions for recombining pieces of non-redundant information, which in turn generates creativity and innovation. Knowledge sharing and the value of social networks, namely social capital, are now explained further.

2.1. KNOWLEDGE SHARING

Nonaka and Konno (1998) use the concept of “Ba”, to define a shared space where emerging human interactions lead to knowledge creation. The individual feels part of the environment. Socialization is the first step of the knowledge creation process, where individuals exchange tacit knowledge through joint activities, like sharing the same environment, spending time together, interacting. Tacit knowledge is embedded in the person's behavior, experience, actions, and values, therefore it is hard to detect and share. Virtual worlds suit the definition of ba, since the shared space can be also virtual in nature. By being a place for socialization and collaboration, a virtual world facilitates the knowledge creation process.

However, virtual worlds possess further characteristics important for knowledge creation and sharing. The population of Second Life transcends any geographical boundary, it is multicultural and has no hierarchical division. The structure of social networks within virtual worlds is characterized mainly by weak ties. Granovetter (1973) differentiates social relationships according to their ties' strength. Strong ties are found in circles of deeply

connected contacts, characterized by frequent interactions, emotional closeness, intimacy, reciprocity, similar interests and perspectives (thus leading to group cohesion), where everybody knows each other. Information circulating in dense social circles is redundant. Weak ties are represented by connections with individuals outside one's circle of contacts. These involve infrequent interactions, low emotional closeness, diversity of interests and perspectives, no tendency to cohesion and, above all, non-redundant information. Granovetter (1973) argues that creativity and ideas generate from weak ties, since they allow individuals to receive non-redundant information from external sources.

Besides network structure, it is fundamental to consider network content (Rodan and Galunic, 2004). A sparse network of disconnected contacts gives the individual more autonomy, but to enhance innovation and creativity it has to be heterogeneous in knowledge. Individual creativity sparks from recombining pieces of diverse knowledge captured from the disconnected contacts. Second Life groups together people with diverse backgrounds, cultures and mindsets. Multiple perspectives and cultural influences combine together unleashing creativity and knowledge by tapping into non-redundant information through weak ties.

2.2. SOCIAL CAPITAL

A concept encompassing both the importance of knowledge creation and social networks' structure and content, is represented by social capital. Social capital implies a source of potential value that resides in the social network of an individual. Rodan and Galunic (2004) argue that the value derives from the heterogeneous knowledge, skills, expertise and know-how an individual is exposed to, within and between social networks. Regarding virtual worlds, the value come from the access to non-redundant information enabled by weak ties.

Moreover, social capital is important for the conceptualization of the virtual world as a society. Putnam (1995) defines social capital as “features of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit”. Bowles and Gintis (2002) associate the concept of social capital to the willingness of individuals to live by the norms of a community and to sanction those not respecting them. The authors define strong reciprocity, the voluntary initiative of a part of members in a community to punish those misbehaving. Such civil engagement leads to the enforcement of norms and ultimately to trust. Under these conditions, and when economic transactions are present, a community rich in social capital benefits from amplified reputation and consequently, reduced opportunism (Putnam, 1995).

Therefore, social capital reinforces the virtual world considered as a society. Sharing common interests and objectives strengthens the affiliation of the individual with the community and the identification with its culture. Moreover it leads people to live by the norms and sanction those individuals threatening the reputation of the community.

The structure of social networks within the virtual world is beneficial for the in-world knowledge sharing and social capital. It is in the technological and social characteristics of the virtual world that reside the potential opportunities the new environment offers for individuals and businesses. These opportunities will become more evident and significant once a broader adoption of the virtual world is obtained. Therefore it is necessary to analyze the drivers of the virtual world's success in order to gain a deeper understanding of the new environment's functioning.

3. LITERATURE REVIEW AND HYPOTHESES

3.1. SUCCESS OF THE VIRTUAL WORLD (DV)

The success of the virtual world is the outcome variable of the research model. It is conceptualized purposely to encompass the dual nature of the virtual world: technological and social.

Boellstorff (2008) identifies two key interpretations of virtual worlds among users: augmentation and immersion. In the augmentation view, the virtual world is considered by users as a *tool*, a communication medium and an extension of real life in the virtual world. In the immersion view, the virtual world is considered a *place* separate from real life, where users immerse and feel the co-presence of others. The interpretation users hold about the virtual world depends on the use they have in mind for it: augmentative or immersive. However for both categories of users, the virtual world is meant for socialization. Moreover to pursue their objectives, they both need the technology to perform well, is it a communication medium (augmentationists) or a place for immersion (immersionists).

The overall success of the virtual world is therefore defined as the residents' belief in the future success of the real world as a communication medium and a place. The success of the virtual world results jointly from the success of the virtual world as a technology and from the level of trust among individuals within the online society.

3.2. CONCEPTUAL MODEL

The research model for this paper is presented in Fig.2. The variables in the oval shapes are latent variables while those in the rectangular shapes are observed variables. Each arrow connecting the model constructs represents one hypothesis.

I conceptualize the success of the virtual world as jointly driven by the success of the virtual world as a technology (VW's use) and by the level of trust among individuals within the virtual society. The two independent variables are in turn individually analyzed thoroughly, in order to make them account for the specific characteristics of the virtual world.

The success of the virtual world as a technology is expressed in the model by the virtual world's use (VW's use). The virtual world's use is measured by the same drivers hypothesized in the Amended Seddon Model (Rai, Lang & Welker, 2002).

Trust is defined by two predictors: generalized trust and particularistic trust. This distinction is important to explain the development of trust in virtual worlds. Trust facilitates social interactions in an environment characterized by anonymity: hereby the uncertainty about residents' identity is considered. Real and virtual identities can be equal, differ to some extent or being totally different. Therefore I identified four motivations behind identity's choice that explain for the eventual identity's discrepancy and its effect on generalized and particularistic trust. The motivations behind identity's choice depend on the purpose that lead the user to create a presence online.

Additionally the model include *acceptance of the proposed identity* as a mediator variable and *exposure to supplementary personal details* as an experimental variable.

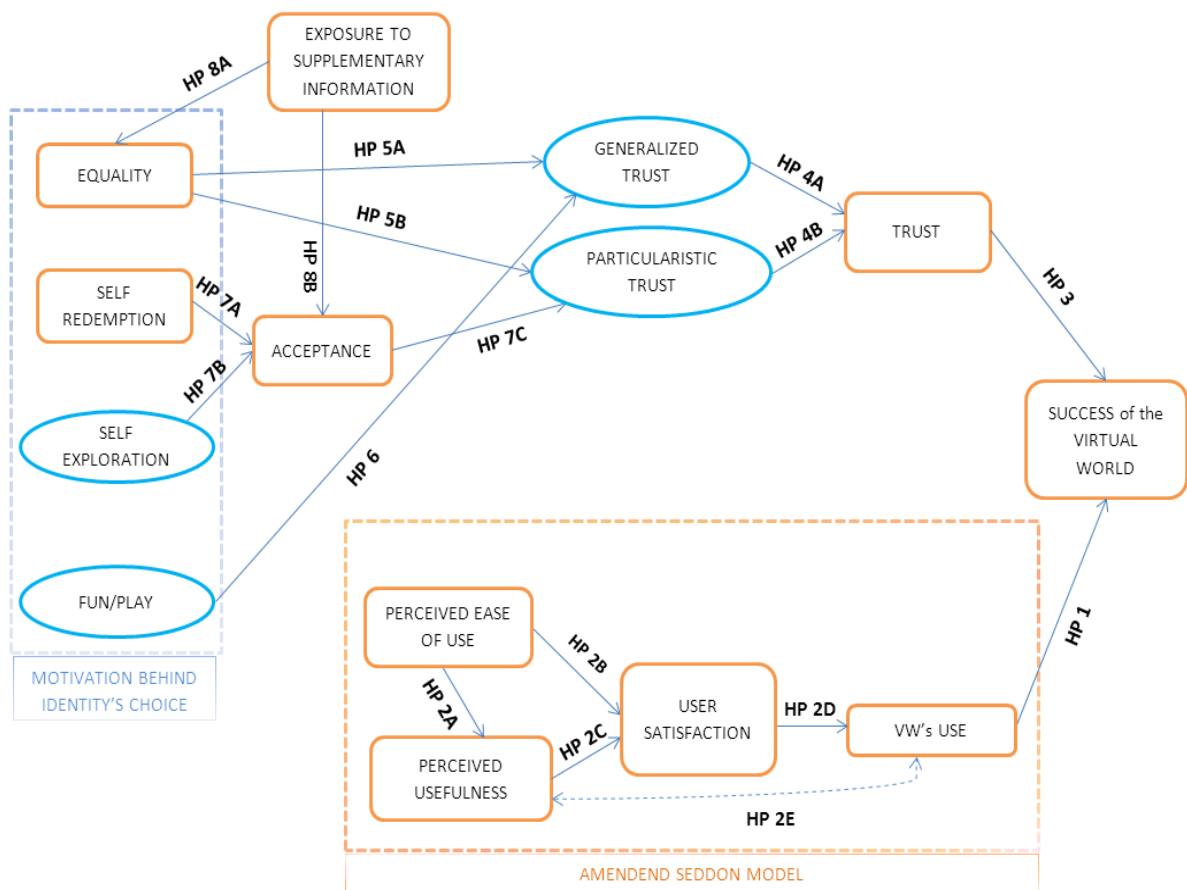


Figure 2: The Conceptual Model

The conceptual model aims at answering the following specific research questions.

Research question 1: *How important are trust and the success of the virtual word as a technology, as determinants for the overall success of the virtual world?*

Research question 2: *How well does the Amended Seddon Model serves us as a valuable model to assess the success of the virtual world as a technology?*

Research question 3: *How do the motivations behind identity's choice in the virtual world influence trust?*

Research question 4: *Does having matching real and virtual identities lead to higher levels of trust compared to having various degrees of identities discrepancy?*

The theoretical background and hypotheses of each individual variable of the conceptual model are now presented.

3.3. SUCCESS OF THE VIRTUAL WORLD AS A TECHNOLOGY (VW's USE)

Important indicators of the virtual world's success as an enabling technology are sociability and usability (Preece, 2001). Sociability refers to the ability of the technology, and of its embedded policies and practices, to support social interactions among users. Usability relate to the effort needed by the user to gain familiarity with the technology (Nielsen, 2000). Second Life has some usability issues that restrain its wider adoption and use. The computer system requirements that permit a smooth immersion are quite demanding, especially in terms of internet connection and graphic card. Once the user has registered and has chosen a standard avatar, it takes a lot of effort to get acquaintance with the new environment even though the new resident (newbie) is initially redirected to specific areas where support is provided. In this lap of time, lie the majority of newbies dropouts. The number of active users over the total amount of registered members gives an insight about the participation level in a virtual world. This value in Second Life is still quite low, about 3% of all registered members log in on a monthly basis¹¹.

Zviran and Erlich (2003) argue that users' motivation to keep on using the technology is influenced by their satisfaction with the technology. Both augmentationists and immersionists demand a technology that enables the smooth achievement of their in-world objectives. Improved satisfaction enhances user retention and loyalty (Lin, 2008) and finally leads to the enhanced usage and consequently to the success of the technology. Therefore success of the

¹¹ Source: <http://gridsurvey.com/economy.php>, retrieved on the 10th October 2012.

virtual world as a technology is measured by the virtual world's use.

Hypothesis 1: *High levels of the virtual world use have a positive influence on the overall success of the virtual world, intended both as a technology and a society.*

3.3.1. AMENDED SEDDON MODEL

The success of a virtual world as a technology (VW's use) is analyzed by using the same drivers of the Amended Seddon Model (Rai, Lang & Welker, 2002). Only the *Information Quality* component is dropped because it is too oriented on organizational tasks. The components of the Amended Seddon Model are: Perceived Ease of Use (PEOU), Perceived Usefulness (PU), User Satisfaction and System Use. The first three components are in common with the Technology Acceptance Model, TAM, (Davis, 1989).

Lin (2008) that has applied the TAM to study virtual communities defines *perceived ease of use*, as "the degree to which a virtual community is perceived to be easy to understand, learn, or operate". *Perceived usefulness* refers to the ability of VWs to enhance residents overall performance in various tasks, like socializing, learning, creating, etc. *User satisfaction* represents the degree of user satisfaction with the virtual world and it is impacted by the virtual world's perceived ease of use and perceived usefulness.

Hypothesis 2a: *Perceived Ease of Use (PEOU) has a positive effect on Perceived Usefulness (PU).*

Hypothesis 2b: *Perceived Ease of Use (PEOU) has a positive effect on User Satisfaction.*

Hypothesis 2c: *Perceived Usefulness (PU) has a positive effect on User Satisfaction.*

So far the model is similar to the TAM. However in the Seddon model we find the additional belief that user satisfaction impacts system use. System *use* is assessed by the *system dependence* that in this context represents the degree to which the user is dependent on the virtual world.

Hypothesis 2d: *User satisfaction has a positive effect on the virtual world's use (VW's Use), assessed by the dependence on the virtual world.*

Rai, Lang and Welker (2002) in their research comparing models for information systems' success found that the Amended Seddon model produces the best fit. To this extent the authors modified the Seddon model by adding a non-directional correlation path between perceived usefulness and system use. They argue that adding this path, reduces the effect of user satisfaction on system use, but strengthen the effect between perceived usefulness and system use.

Hypothesis 2e: *There is a strong correlation between perceived usefulness (PU) and the virtual world's use (VW's Use).*

3.4. TRUST

To start from a commonly accepted concept of trust, the definition from the Oxford English Dictionary will be adopted. Trust is the “firm belief in the reliability, truth, or ability of someone or something”¹². Trust is people's belief in the good intentions of others, namely, they believe others will respect their rights, carry out obligations and not cause any harm to them (Yamagishi, 1998). The main characteristics of trust are reliability, predictability and fairness (Ba, 2001).

In virtual environments where interactions and transactions are hard to monitor due to asymmetrical information among parties (e.g. virtual anonymity, lack of identifiability), community governance is likely to exert a dominant role. As argued about the characteristics of virtual worlds, social capital reinforces the virtual world considered as a society. Since the reputation of the entire community is threatened by the unethical behavior of its members, intra-community, self-sanctioning practices arise, driven by the sense of belonging to the community and social pressure (Ba, 2001). Experimental research shows that in situations of uncertainty and risk, networks of committed exchange partners arise, prompting higher level of trust (Cook, 2005).

Arrow (1972) and Fukuyama (1995) believe that the level of trust in a society strongly predicts its economic success. Augmentationists and immersionists, look for sociability in a virtual world, therefore for the development of interactions and transactions in an environment of uncertainty and vulnerability like the virtual world, trust is fundamental (Ba, 2001). Hence, trust among individuals within the virtual society is essential for the overall

¹² Retrieved from: www.oxforddictionaries.com

success of the virtual world.

Hypothesis 3: *High levels of trust among individuals within a virtual society have a positive influence on the overall success of the virtual world, intended both as a technology and a society.*

3.4.1. GENERALIZED TRUST AND PARTICULARISTIC TRUST

As seen in the description of the virtual world considered as a society, the social networks' structure is characterized mainly by weak ties. Interactions develop among strangers, moreover these interactions are infrequent. To comprehend how interactions develop in such context, an additional conceptualization of trust embodying its underlying components is adopted. There are two kinds of trust, that have important implications on social networks: generalized trust (Yamagishi, 1998) and particularistic trust or relationism (Hamaguchi, 1977; Kashima et al., 1995; Uleman et al., 2000).

Generalized trust is based on the general belief in human goodwill and benevolence. It encourages the interaction and development of social relationships among strangers: individuals create social connections outside the usual circle of friends. Higher levels of generalized trust are likely to lead people to cooperate more with strangers, than lower levels of generalized trust (Yamagishi 1986). *Particularistic trust*, on the other hand, is characterized by emotional closeness, commitment, and similarities with known others. It helps maintaining and strengthening social relationships once they are created.

Virtual third places, argue Steinkuehler and Williams (2006), are suitable for bridging social capital, namely, to connect independent people (weak ties) and bringing different perspectives together. Virtual worlds initially enhance mainly bridging. Bonding social capital, the value that originates by creating deeper ties with members, comes slower, by developing emotional closeness. Therefore, in this phase of SL life cycle, generalized trust is expected to have a stronger weight on trust than particularistic trust.

Hypothesis 4a: *Generalized trust, which facilitates interactions among strangers, has a strong positive effect on overall trust.*

Hypothesis 4b: *Particularistic trust, which helps consolidating and deepening social ties, has a moderate positive effect on overall trust.*

Igarashi et al. (2008), argue that generalized trust and particularistic trust are positively associated with network homogeneity and closure, because similar attitudes attract people that are alike, making it easier to maintain and reinforce their ties. Moreover, Alesina and La Ferrara (2002) claim that heterogeneous communities have a lower level of trust because they group together ethnically and culturally different people with dissimilar attitudes. They define it “aversion to heterogeneity”. However, in heterogeneous communities like virtual worlds that bring together people with dissimilar backgrounds and attitudes, trust develops through alternative patterns. Residents are strongly committed to virtual worlds because they share similar interests and they imply sociability and sense of belonging (Ba, 2001). Shared interests and the explorative and emphatic side of the virtual experience is what lead to social affiliation and identification. Community identification positively affects interpersonal trust (Kim, Lee & Kang, 2012).

3.5. IDENTITY

In virtual worlds, the increased self-disclosure among user encouraged by anonymity can lead online relationships to develop faster than in real life (McKenna et al., 2002). Reciprocated self-disclosure, increase in turn intimacy among actors and consequently trust. Analyzing the motivations that lead people to choose for a certain degree of real identity disclosure through their virtual identity, relatively to the reason for creating a presence online, will help explaining how trust develops in the virtual world.

3.5.1. MOTIVATIONS BEHIND IDENTITY’S CHOICE

Most of the available research on identity in virtual worlds, analyzes the interrelation between avatar’s identity and appearance. Neustaedter and Fedorovskaya (2009) claim that avatar’s appearance is influenced by the social norms of the virtual world and by the identity one wants to be represented by in virtual worlds. The authors categorize users according to four identity types: Realistics, Ideals, Fantasies and Roleplayers.

Realistics, wants their avatars to match RL and VW identities, personalities and appearances, their virtual life is considered as an extension of real life. Ideals differentiate from Realistics only on two aspects: they improve their virtual world appearances, to get closer to their idealized outlooks and they perceive the virtual world as being separate from

RL, not an extension. Fantasies are those users willing to keep RL and VW identities, appearances and realities separated, to serve such need their avatars' looks are imaginative. The first three categories of users aim at keeping their identity constant over time. Finally roleplayers, differentiate from fantasies, just because they change identities continuously or create multiple avatars in order to fulfill identity needs and to experience situations that are unique to virtual reality.

Ovadia (2007) argues that Second Life's inhabitants are divided in two opposite categories: those continuously shifting from virtual to real world, cultivating interests and friendships that were born online also in the ordinary day life, and those who think that this parallel universe should be kept apart without intersecting with their real identity.

Wallace (1999) believes that residents' purpose for creating a presence online, constitute the essential factor mediating behavior. The way residents use VWs, depends instead on how they are interpreted, what they have to offer and on the residents' opinion about real life. The way residents interpret VWs, bring us back to the distinction of the two visions of virtual worlds: immersion and augmentation. A resident's view on it: *"is SL for you a place or a tool? Everything else, from standards of identity and personal details provided, follows from that"*. However, these two views can co-exist, as a resident put it: *"immersion doesn't mean that your SL and RL identity are two sides of you that should not mix, instead it means immerse in the VW experience just like reading a good book. One can be immersed even with an avatar resembling his/her RL look"*.

Short et al. (1976) argue that the more the medium is able to convey social presence, the greater will be the intimacy among users. As discussed earlier, anonymity and disinhibition facilitates self disclosure, leading in turn to greater intimacy and consequently to trust development. This idea of trust development through self disclosure encompasses both immersionists and augmentationists. The various degrees of self disclosure in the virtual world, are rendered through the eventual discrepancy between real and virtual identity.

My approach is to interpret the eventual difference between real (1st) and virtual (2nd) self in terms of the motivation behind the identity discrepancy and then observe how it affects trust in the virtual world. Avatar appearance is not object of study. Departing from the four categories delineated above, new ones stemming from the motivations behind identity discrepancy are developed: equality, self-redemption, self-exploration, fun and role-play.

- **Equality** stands for no discrepancy between real and virtual identity and behavior, the user presents himself as the real person behind the avatar. In this category we find the

majority of augmentationists, they consider the virtual world as tool to extend real life into the virtual world. Disclosing information about the real identity behind the avatar is a trusting behavior towards the recipient (Blau, 1964 and Crosby et al., 1990) therefore it is expected to positively influence both generalized and particularistic trust.

Hypothesis 5a: *(Identity) Equality has a positive effect on generalized trust.*

Hypothesis 5b: *(Identity) Equality has a positive effect on particularistic trust.*

- The ***self-redemption*** category is characterized by those individuals who see the virtual world as a second or better chance for living. Health problems, relational and social difficulties are potential reasons behind the need of a person to seek for another opportunity or to reintegrate into social life free from his burden. Real and virtual lives are kept apart.

Rogers (1951) claims that the actual self, our real life personification, might not match the true self, but serves us as a protection from vulnerabilities. Crafting our online persona can help us understand and express our true self, freed from any constrain of real life. As a resident argues: “*An avatar constructed out of the depths of my mind might reveal who I had always hoped to be, things I regret, wishes and dreams achieved or unachieved, values, desires, and insecurities. It might reveal something profound about my experience of self that would ordinarily take other people many, many conversations with me to discover*”.

- ***Self-exploration***: through their virtual experience, users discover and test new or unknown aspects of their personality. Anonymity and the disinhibition effect help behaving more openly and truly without fearing any repercussion on the real identity (Joinson, 2003).
- ***Fun and role-play*** are the motivations that draw the individuals of the last category to virtual worlds.

Besides equality, all the other categories represent cases with some degrees of discrepancies between real and virtual identity. However what all four categories have in common is the disinhibition effect. Suler (2004) argues that disinhibition can be positive,

“benign disinhibition”, or negative, “toxic disinhibition”. The author defines benign disinhibition, as the one promoting self disclosure, altruism, kindness and self-development. People open up sharing personal details, emotions and problems. Toxic disinhibition, on the contrary, leads to unethical practices, misbehavior, cheating, deception, violence, crime (Suler, 2004).

Anonymity and the disinhibition effect not only allow people to behave freely without fearing repercussions on their real identity, but also nurture the general anxiety of becoming victim of unethical behaviors. Creating a presence online for having fun and playing a role is often taken negatively as an implicit indication for toxic disinhibition therefore it is expected to have a negative influence on generalized trust.

Hypothesis 6: *Fun and role-play has a negative effect on generalized trust.*

3.5.2. ACCEPTANCE OF THE PROPOSED IDENTITY

Even though the virtual world is a place characterized by anonymity and disinhibition, there are still people that prefer keeping their real identity completely unknown and wish to be represented solely by their virtual identity. In this and in less extreme cases, hindering partially or fully real life details and the willingness to keep them separate can undermine trust. However, unveiling the reason behind real and virtual world identity discrepancy, being a social problem or a need for self-exploration, create intimacy and consequently trust through the *acceptance of the proposed identity*. Nonaka and Konno (1998) argue that an individual empathizes with others by sharing feelings, emotions, experiences and mental models, which consequently reduce barriers with them and finally lead to care, love, trust and commitment.

A resident argues: “*People's in-world history, behavior, and reputation matter a lot more to me than any claims of atomic world legitimacy.*” Or another: “*I'm curious at what's driving other people and I like the discussion. Understanding makes it easier to accept and "let live", and it does not necessarily mean that you agree*”.

Acceptance of the proposed identity is a construct identified through the netnographic study performed. The acceptance of the proposed identity is hereby defined as the emotional closeness and empathy that generates from disclosing sensitive motivations that clarify the secrecy about the real identity. Without self disclosure about the sensitive motivations for the identities' discrepancy, we return to the category of fun and role-play which negatively

impacts trust. A resident remark, helps understanding the importance of acceptance of the proposed identity from an immersionist point of view:

“You've assumed I'm what you are: a person, with a body and a long history in the atomic world, who speaks through a little cartoon figure in SL from time to time. You think it's weird, maybe a little cute, maybe a little creepy, that I don't talk about my carpal tunnel, my mortgage, my co-workers, my partner, my self. You think I'm hiding who I really am. That makes me feel like a liar and a fraud, and makes me wonder how you could possibly like or trust me. I can try to explain what it is I am - and I'd ask you to either accept me on my own terms, or treat me as you would any other liar and deceiver. I'm not someone playing a role, or manipulating an avatar like a chess piece or a mask I speak from behind. I'm not anything but what I seem to be. (...) When I'm not online, I don't exist. There is another mind I share a body with - they're not me in any meaningful way. (...) I don't use Voice. I have a friend who doesn't - because her voice might be recognized, and her day job compromised. (...) I have a friend who doesn't - because a car accident damaged her trachea. (...) I have friends who don't - because their avatars and their bodies don't match in gender. (...) For many of us, SL isn't just another communications tool - IM with moving pictures - but our lives, our homes, our refuges. (...) I consider you friends as well, but friendships have to be based on trust and acceptance.”

The acceptance of the proposed identity comes into play for the self-redemption and self-exploration categories. When real and virtual identities are not equal because of some sensitive motivations (e.g. social or health-related), emotional closeness and empathy develops through self disclosure. Empathy and social support bring closer also people with little in common (Joinson, 2003).

Hypothesis 7a: *Self-redemption has a positive effect on acceptance of the proposed identity.*

When real and virtual identities are not equal because the individual wants the virtual world to be a place for self-discovery, emotional closeness and intimacy develops with self disclosure. Through introspection and self-exploration users try to solve interpersonal problems and discover new aspects of their identity. Different contexts let multiple traits of identity emerge. As a resident claims: *“Even though the personalities of the flesh and the avatar are similar, the experiences of the flesh and the avatar are quite different”*.

Boellstorff (2008) argues that there is more role-playing happening in real life than in virtual worlds. In real life people conform to uses and practices typical of their culture. These constraints limit self-discovery because one has to protect the acquired reputation and image, going against the flow is considered awkward. In virtual worlds, anonymity and the lack of a strong cultural influence, create a comfort zone for the user to find out more about himself and his personality, while reinforcing self-confidence. As a resident claim: *“I can bring out a different aspect of my inner self here, but I don't get to make false claims about my atomic self.”*

Hypothesis 7b: *Self-exploration has a positive effect on acceptance of the proposed identity.*

Acceptance of the proposed identity is supported by benign disinhibition. By sharing personal information and vulnerabilities, self disclosure helps to strengthen newly formed relationships by developing trust, emotional closeness and intimacy (Archer, 1980; Laurenceau et al., 1998). Therefore:

Hypothesis 7c: *Acceptance of the proposed identity has a positive effect on particularistic trust.*

3.5.3. EXPOSURE TO SUPPLEMENTARY PERSONAL DETAILS

Bargh et al. (2002), argues that people are more willing to disclose personal details about themselves to strangers because they are external to one's social network, thus causing no repercussion on the real image and reputation. As we have seen, virtual worlds are characterized by weak ties.

By disclosing personal details, people show a trusting behavior towards others and in turn, induce others to trust them. Revealing personal information make the user appear less than a stranger and more of an acquaintance to the counterpart (Blau, 1964; Crosby et al., 1990). As a resident with an augmentation view argues: *“Not everybody wants to talk about Real Life, and shouldn't have to. But, by the same token, if you want to talk about Real Life, you should be free to. (...) but my general rule is, the more of your Real Life you entrust with me (and I do see it as a sign of profound trust to reveal it) the more of my Real Life I'm willing to entrust*

with you.” On the contrary an immersionist says: “You can talk to me about your life and whatever's important in it. I'm happy to listen and to help. When I reciprocate, I'll share about my life too which is –here” (meaning in the virtual world). What is worth observing here, is that even though the two residents have opposites views about the virtual world, as a tool for the first and as a place for the second, both respond reciprocating when someone discloses personal information with them, they just differentiate on what they consider being the closer representation of themselves in the context.

Exposure to supplementary personal details is an experimental variable introduced in the model to assess whether two variables of interest, equality and acceptance of the proposed identity, are affected by the factor under test that is when additional personal information get disclosed.

Hypothesis 8a: *Exposure to supplementary personal details has a positive effect on equality.*

Hypothesis 8b: *Exposure to supplementary personal details has a positive effect on acceptance of the proposed identity.*

4. METHODOLOGY

The research over trust in Second Life is based on two methodologies: a netnography and a residents' survey. These two techniques are implemented simultaneously and they work jointly to:

- reinforce the hypotheses which are not simply supported by the literature review but also from the actual arguments of residents;
- refine the analysis as it is performed;
- have a double approach to the investigation which further reinforces the findings.

For instance, the conceptual model originally included reputation systems as a moderating factor influencing positively trust. The survey presents questions aimed at testing this variable, however from the literature review and some statements of residents, motivations to omit the variable have emerged. Jøsang, Ismail & Boyd (2007) argue that trust develops mainly from personal direct experience with an individual, however when prior personal experience is not available as in SL, trust has to be based on referral from others, namely reputation.

Reputation systems need to fulfill three properties to be effective: the subject of the reputation is long lived, interactions are collected and distributed, and finally, ratings about past interactions guide present and future actions (Resnick et al., 2000). Second Life does not meet all these requirements. To outline the main problematic, two premises are useful: users' real identity is generally unknown¹³ and it is possible to create multiple avatars. Reputation is based on identity (Ba, 2001); in Second Life specifically, the virtual identity is the object of the rating. Nonetheless, when someone has compromised his avatar's reputation by misbehaving, he can abandon the avatar and create a clean new one, breaking the connection with the adverse rating record (2001). Regarding the second and the third property of reputation systems, it is possible to rate transactions' partners in Second Life's marketplace, however the utility is limited, since misbehavior does not occur exclusively in such context, let's just think for example about harassment, deception, vandalism. Linden Lab encourages residents to report any kind of abuses that occurs but the information about offenders and measures taken against them is not shared with the community. Moreover, as mentioned before, Ba (2001) argues that community governance, based on the initiative of strongly committed individuals, asserts a dominant role in regulating and defending the virtual

¹³ The credit card authentication is requested to non-paying members executing monetary transactions or in the registration process of premium members.

community.

Respondents' opinions about reputation metrics are not encouraging: *"Ratings of others are only significant if they give a very clear sign (e.g. close to 0 or 100%) even then the number of votes or rather the unique number of votes should be taken into account"* furthermore *"SL had this rating once; but they have forsaken it: as it was easy to manipulate it. And since it is not hard to change IP address or create new accounts; Manipulation is easy for those who really want to fraud."* Another respondent affirms *"the rating thing especially - that would and is a completely disastrous idea"* and finally a different one, *"I can't think of any system that has tried to indicate trustworthiness or rank people and has also worked. Anybody can be anybody; which includes being more than one person."* This was a practical example on how the interplay between the two methodologies, helped in refining the research purpose.

4.1. NETNOGRAPHY: FORUMS AND RESIDENTS' BLOGS

Kozinets (2002) defines netnography as a qualitative research model specifically designed to address the nature of virtual communities and environments. This online ethnography is unobtrusive because it collects data available on public forums and blogs without being influenced by the researcher. Netnography is easier to perform than traditional ethnography, because it provides contextualized data without the need to create an environment that reproduces the context of study which is time consuming and put the researcher in an influential position (Lehdonvirta, Lehdonvirta & Baba, 2011). The researcher is a participant of the online environment therefore the data gathered are more relevant because he can understand in-world practices and problematic with an insider point of view. Netnography is valuable for listening to the voice of residents of the virtual world on topics which are significant to the research.

By spending a considerable amount of time in Second Life, I could experiment the initial difficulties of newbies, the development stages of the avatar's life and the implementation of various Second Life updates. Popular Second Life's forums and residents' blogs were analyzed for the netnographic study of this paper to get a glimpse of the in-world life and main arguments discussed by residents. Only those forums and blogs which were relevant to the research questions and that hosted opinions from a heterogeneous sample of residents were retained. The discussion about considering the virtual world as a place or a tool, had participants ranging from completely immersed people who identify themselves only with

their virtual identity, to augmentationists that openly disclose their real identities' information in-world. The conceptual model and the survey have been designed with the aid of such an understanding of Second Life's culture and practices.

Netnography is considered as stand-alone qualitative research method; however, by associating it with a survey, more consistent and significant conclusions can be drawn. The strength of netnography lies in the revelatory depth of specific groups' online communications (Kozinets, 2002).

4.2. RESIDENTS' SURVEY:

Data collection

The survey targets specifically Second Life users. Data for the study were collected by means of an online based survey, whose link was posted on about forty SL forums and dedicated websites from various world regions. The link to the survey was randomly redirecting the respondents to one of the two versions of the questionnaire that differed solely on the questions performing simulations (questions 5a-b, 6a-b and 8a-b, marked in blue color, see Appendix). Simulations were used to create a setting for individuals to think in terms of real situations that might occur. The reason behind the choice of creating two different surveys was to test whether the results differed when few details of the story have changed, avoiding the coherence bias. In question 8 (a-b) for instance, if one considered Z.A. very trustworthy with a reputation rating of 95%, subsequently, when this value was reduced to 65% by the variation in the story, he would have probably assigned a lower level of trust to this person, just for being coherent in the responses.

The first survey was administered at the end of 2008. To assess whether time had an effect on responses, another round of surveys were distributed at the end of 2010 following the same procedure. A total of 243 surveys were collected, 174 in 2008 and 69 in 2010. The time variable was checked for possible effects on the model variables but no significant association has been found. There was only a higher incidence of users' dependence on SL in 2008 compared to 2010. Hence the datasets of the two years were merged. The sample includes residents that range from newbies to older/more experienced residents.

4.2.1. MEASURES

Success of the virtual world

The virtual world overall success is measured by one item that was developed specifically for the purpose of this paper (question 15b, see Appendix). The item measures the beliefs about expectations of future success of the virtual world, encompassing both visions of the virtual world as a tool and a place.

Amended Seddon Model

All the components of the Amended Seddon Model adopted in this paper are assessed by a one-item measure. The items to measure perceived ease of use and perceived usefulness are based on the Technology Acceptance Model (Davis, 1989) although modified to adequate the context of study (questions 12 and 13, see Appendix). Rai, Lang and Welker (2002) in their study, used a one-item measure for user satisfaction and system use (measured by system dependence). The questions about user satisfaction and VWs dependence are borrowed from their research (questions 14 and 15a, see Appendix).

Trust

Trust is hard to measure. To make this analysis more accurate and efficient, the questionnaires owe some parts to the literature review. Two conceptualizations of trust are employed, together with the motivations behind identity's choice in order to delineate the best predictors of trust in the virtual environment.

Trust and trustworthiness are two distinct concepts that are often used as synonyms in the literature. Trust is the act of a person of placing his trust in someone or something, regardless of the effective good nature of the object of trust. Trustworthiness, on the other hand, is the characteristic of someone or something that is the object of trust, to be considered worth being trusted. (Corritore, Kracher & Wiedenbeck, 2003).

Glaeser, Laibson, Scheinkman, and Soutter (2000) have demonstrated in their study that general attitudinal questions about trust taken from the American General Social Survey, actually measure trustworthiness instead of trust. To measure trust, the authors identified better predictors, namely questions about trusting strangers and past trusting behaviors. Fehr, Fischbacher, Rosenbladt, Schupp, and Wagner (2003) have also come to the same conclusion, for this reason the questions about direct trust in strangers and past trusting behavior from their research are adopted in this study (questions 1 and 2, three items scale each, see

Appendix). The question n.1 is measured by a 4 points Likert scale, as in the original study. Probably the authors used it on purpose to force the respondents to take a definite position on the matter instead of allowing for a neutral response.

Generalized and particularistic trust

As seen in the literature review, trust can be distinguished in generalized and particularistic trust. This definition was adopted by Igarashi et al. (2008) in their investigation over trust in social networks. Since virtual worlds are characterized by social networks with mainly weak ties, the questions about generalized and particularistic trust are borrowed from their work because they adapted well to the context of study. Generalized trust is measured by a five items scale while particularistic trust is measured by a seven items scale (question 11 and 10, see Appendix).

Motivations behind identity's choice

No suitable previous study analyzing the motivations affecting identity's choice could be found. Therefore specific items were designed for each category in this paper for the purpose.

- Identity equality

To investigate how respondents react to identity equality, a simulated story that might occur in the virtual world was implemented. There are two versions of the story, one with more and the other with less personal information disclosed and they are administered to two different subsets of respondents A and B (questions 6a in questionnaire 1 and question 6b in questionnaire 2, see Appendix). In the version A, verifiable details about the avatar's real life identity are disclosed compared to a version with no verifiable details, version B.

- Self-redemption

Self redemption is measured by a one item designed specifically for the purpose of the research (question 4d, see Appendix).

- Self-exploration

Self exploration is measured by a two items scale designed specifically for the purpose of the research (questions 4a and 4e, see Appendix).

- *Fun and role-play*

Fun and role-play is measured by a two items scale designed specifically for the purpose of the research (questions 4b and 4c, see Appendix).

Acceptance of the proposed identity

To investigate the acceptance of the proposed identity, a simulated story that might occur in the virtual world was implemented. There are two versions of the story, one with more and the other with less personal information disclosed and they are administered to two different subsets of respondents A and B (questions 5a in questionnaire 1 and question 5b in questionnaire 2, see Appendix). In this case in the version B more details about the social problem behind the willingness of the resident to be represented solely by the virtual identity are given compared to a version A with no explanation.

Exposure to supplementary personal details

A condition has been introduced in the model to assess whether two variables of interest, equality and acceptance of the proposed identity are affected by the factor tested, namely when supplementary personal information get disclosed. Each variable is measured by a simulated story that might occur in the virtual world. There are two versions of the story, one with more and the other with less personal information disclosed, furthermore they are administered to two different subsets of respondents A and B. The condition is needed to analyze separately the two subsets of respondents to test whether the exposure to supplementary personal details affects the two variables.

4.2.2. DATA ANALYSIS

SPSS 20 was used to assess variables' distribution. Skewness and kurtosis values lower than |1| indicated a normal distribution, whereas values greater than |1| indicated a non-normal distribution. Several variables violated the normality assumption, thus they were treated as ordinal. For the complexity of the model and to assess whether alternative combinations of constructs were offering a better fit, the Structural Equation Modeling (SEM) was selected for the analysis. However, since AMOS, add on module of SPSS, did not provide a valuable solution for using ordinal variables for conducting the SEM, Mplus 6.1 (Muthén and Muthén, 2010) was used for performing the Structural Equation Modeling (SEM). In the SEM, the Weighted Least Square Method (WLSM) was used for ordinal, continuous, and binary

variables (Flora and Curran, 2004; Finney and DiStefano, 2006). Goodness of fit indexes adopted included the Tucker-Lewis Incremental fit index, TLI (Tucker and Lewis, 1973), the Comparative Fit Index, CFI (Bentler, 1990), RMSEA and the χ^2/df ratio (Crowley and Fan, 1997).

Participants

Of the total sample, 41.6% of the respondents were men and 55.6% were women, 7 participants did not provide a valid answer to this question. The mean age of participants was of 37.08 years (SD=11.07), the sample resembled the age range of Second Life's population (min=16, Max=67). Thirty participants out of 243 respondents did not provide a valid answer for the variable age. The following tables show the frequencies for age categorized in four classes and for usage.

		Frequency	Percent	Valid Percent
Valid	1) <= 28	56	23.0	26.3
	2) 29 - 37	51	21.0	23.9
	3) 38 - 45	54	22.2	25.4
	4) 46+	52	21.4	24.4
	Total	213	87.7	100.0
Missing		30	12.3	
Total		243	100.0	

Table 1: Age in four classes

		Frequency	Percent
Valid	1) 0-9 h per week	52	21.4
	2) 10-19 h per week	72	29.6
	3) 20-29 h per week	52	21.4
	4) 30-39 h per week	26	10.7
	5) more than 40 h per week	41	16.9
	Total	243	100.0

Table 2: Usage

5. RESULTS

Measurement Model

As a first step, reliability and validity of the measurements were evaluated. Cronbach's alpha was meant for scales with at least three items, hence we had the following results for the variables that respected this requirement:

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Factor Determinacy
Trust	.595	.614	.877
Generalized Trust	.890	.889	.961
Particularistic Trust	.767	.768	.900

Table 3: Cronbach's alpha and Factor Determinacy

Both generalized and particularistic trust showed a high level of reliability, with alpha greater than 0.70. The items measuring trust were on different range of Likert scales, however also the Cronbach's alpha based on the standardized items remained low. The items measuring trust were borrowed from the literature, as in the original study from Fehr et al. (2003) they were, indeed, considered the best predictors for trust. Similarly to Cronbach's alpha also factor determinacy measured scales' internal consistency, although on the latent aspect. Values for factor determinacy greater than .70 are considered sufficient, values greater than .80 are good and values greater than .90 are excellent.

To assess the consistency of scales making up the ordinal variables self-exploration and fun/play, since they are two items scales, the Spearman Rank Order Correlation (rho) was calculated. Table 4a and 4b show they are highly significant and largely correlated.

Correlations

Spearman's rho		Self Exploration 1	Self exploration 2
Self Exploration 1	Correlation Coefficient	1	.543(**)
	Sig. (2-tailed)	.	0
	N	242	238
Self exploration 2	Correlation Coefficient	.543(**)	1
	Sig. (2-tailed)	0	.
	N	238	238

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

Table 4a: Correlations

Correlations

Spearman's rho		Fun/play1	Fun/play2
Fun/play1	Correlation Coefficient	1	.416(**)
	Sig. (2-tailed)	.	0
	N	241	241
Fun/play2	Correlation Coefficient	.416(**)	1
	Sig. (2-tailed)	0	.
	N	241	242

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

Table 4b: Correlations

Structural Model

Descriptive statistics are provided on the table 5, together with means and standard deviations, the indexes of normal distribution were calculated. The variables resulting in skewness and kurtosis greater than |1| were treated as ordinal, whereas those with values lower than |1| were considered normally-distributed and treated as continuous.

DESCRIPTIVES

	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Trust1	2.54	.743	-.261	.157	-.242	.314
Reversed Trust 2	2.71	.853	-.105	.157	-.667	.314
Reversed Trust 3	1.58	.708	1.030	.156	.521	.311
Trust 4	3.22	1.097	-.139	.156	-.742	.311
Trust 5	2.61	1.128	.344	.156	-.675	.311
Trust 6	2.14	1.398	.922	.156	-.544	.312
Self Exploration 1	3.17	1.433	-.257	.156	-1.259	.312
Fun/play1	2.17	1.122	.553	.157	-.680	.312
Fun/play2	2.90	1.352	-.014	.156	-1.260	.312
Self redemption	1.95	1.214	1.077	.156	.034	.312
Self exploration 2	2.35	1.347	.545	.158	-1.013	.314
Acceptance A and B	3.57	1.532	.100	.156	-.785	.311
Identity Equality 2 A and B	3.74	1.492	-.045	.156	-.545	.311
Reversed Part. trust 1	3.96	1.103	-.987	.156	.235	.311
Particularistic trust 2	3.31	1.072	-.255	.156	-.476	.311
Reversed Part. trust 3	3.74	1.042	-.707	.157	.073	.312
Particularistic trust 4	3.43	1.055	-.372	.156	-.505	.311

Particularistic trust 5	3.80	1.005	-.752	.156	.214	.311
Particularistic trust 6	4.07	.970	-.976	.156	.520	.312
Particularistic trust 7	4.25	.884	-1.322	.157	1.928	.312
Generalized trust 1	3.18	.952	-.303	.156	-.120	.311
Generalized trust 2	3.07	.977	-.240	.156	-.358	.311
Generalized trust 3	3.64	.858	-.771	.156	.749	.311
Generalized trust 4	3.21	.966	-.229	.156	-.277	.311
Generalized trust 5	3.47	.924	-.571	.156	.077	.311
Perceived Ease of Use	4.84	1.751	-.537	.156	-.748	.312
Perceived Usefulness	5.15	1.652	-.843	.156	.014	.312
User satisfaction	5.47	1.500	-1.115	.156	.700	.312
Dependency on SL	3.59	2.019	.086	.156	-1.322	.312
Success	5.08	1.628	-.724	.156	-.215	.311

Table 5: Factor Loadings

The SEM was performed using the Weighted Least Squared Means and Variance adjusted estimator (WLSMV), which performs well with model comprising a mixture of normally and non-normally distributed variables (is the default predictor in Mplus in case of a mixed model). The structural model relationships among constructs, the resulting path coefficients and the relative significances have been graphically represented on figure 3 (non-significant relationships have been discarded in order to increase the readability of the model).

The modification indices provided further adjustments that were able to improve the fit of the model. In line with the literature, 6 additional direct associations were included (three were shown in red color in figure 3; the six direct additional associations are showed in figure 4). The goodness of fit indexes presented, already accounted for the effect of the additional variables.

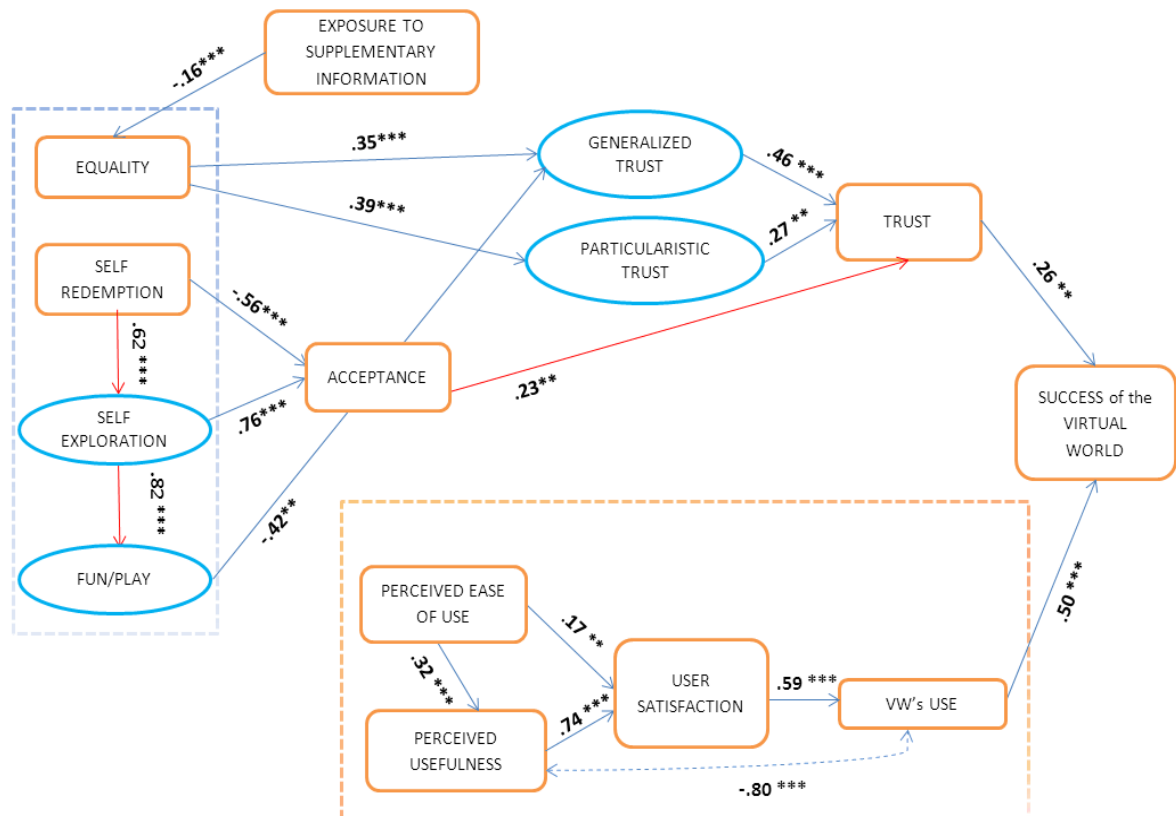
The indexes of fit showed the adequacy of the model tested. The CFI/TLI were respectively **.921/.910**, generally CFI and TLI scores higher or equal to .95 indicates good fit, while scores higher or equal to .90 indicates acceptable fit. The RMSEA was equal to **.061**. Scores lower than or equal to .06 for RMSEA indicates a perfect fit, while a score lower than or equal to .08 indicates a sufficient fit of the model. Finally, χ^2/df was equal to **1.89**. A χ^2/df ratio lower than 5 indicates a good fit for the model (Bollen, 1989; Crowley and Fan, 1997; Hu and Bentler, 1999; Schermelleh-Engel, Moosbrugger and Muller, 2003).

Convergent validity of the measurement model was assessed by the factor loading from the confirmatory factor analysis (CFA): all factor loadings should exceed a threshold of 0.4.

	Factor Loadings's range
Trust	.266 - .873
Generalized Trust	.653 - .954
Particularistic Trust	.381 - .703
Self Exploration	.773 - .785
Fun/Play	.588 - .814

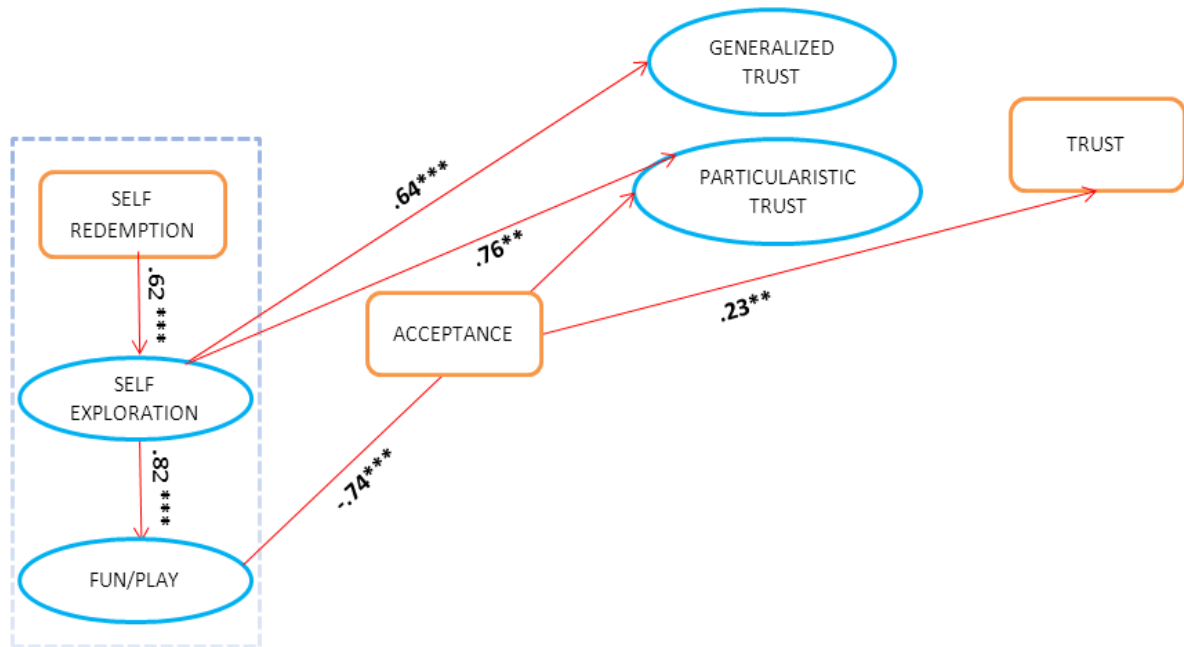
Table 6: Factor Loadings

Trust dimension showed items' loadings ranging from .266 through .873. Particularistic trust dimension showed items' loadings ranging from .381 through .703. Even though the minimum loading values for these dimensions were below the threshold value, the maximum values justified the choice to retain all items.



*** $p < .001$ ** $p < .01$ * $p < .05$

Figure 3: Results of the SEM



*** $p < .001$ ** $p < .01$ * $p < .05$

Figure 4: Additional direct paths found. These additional direct paths add on the hypothesized paths from figure 3 (in blue color) and are included in resulting goodness of fit indexes.

The flexibility provided by the SEM to further test indirect relationships led to the identification of seven additional highly significant indirect relationships. Indirect relationships do not change the model fit. The results of the structural SEM, including direct and indirect relationships, are here provided following the same order of the conceptual model.

Success of the virtual world

A significant relationship between VW's use and overall success of virtual world was observed (path coefficient = .50, $p < 0.001$), providing support for H1. Trust, was associated with greater overall success of the virtual world (path coefficient = .26, $p < 0.01$), supporting H3.

Amended Seddon Model

Perceived ease of use was correlated with both perceived usefulness (path coefficient = .32, $p < 0.001$) and user satisfaction (path coefficient = .17, $p < 0.01$), providing support for H2a and H2b. Greater perceived usefulness was associated with greater user satisfaction (path coefficient = .74, $p < 0.001$), which showed a significant association with VW's use (path

coefficient = .59, $p < 0.001$), supporting H2c and H2d respectively. Interestingly, perceived usefulness resulted correlated with lower VW's use (path coefficient = -.80, $p < 0.001$), failing to support H2e.

Generalized and particularistic trust

Generalized trust was significantly associated with greater trust (path coefficient = .46, $p < 0.001$). Similarly, particularistic trust was related to greater trust (path coefficient = .27, $p < 0.01$), providing support for H4a and H4b respectively.

Motivations behind identity's choice

Since the acceptance of the proposed identity and the exposure to supplementary personal details are related to specific variables, they will be explained in the section regarding the variable of interest.

- Identity equality

The participants presenting the condition of being exposed to more personal details resulted with slightly lower but still significant equality (path coefficient = -.16, $p < 0.001$). As expected, identity equality was significantly associated with both greater generalized trust (path coefficient = .35, $p < 0.001$) and particularistic trust (path coefficient = .39, $p < 0.001$), providing support for H5a and H5b.

- Self-redemption

Unexpectedly self-redemption was significantly associated with lower acceptance (path coefficient = -.56, $p < 0.001$), giving the insight to look for possible unconsidered direct and indirect relationships. An additional direct association found, showed that self-redemption was significantly related to self-exploration (path coefficient = .62, $p < 0.001$). Self-redemption was indirectly associated with acceptance through self-exploration, namely, greater self-redemption may enhance self-exploration that in turn enhances acceptance ($\beta = .181$, $p = 0.001$), which allowed to avoid discarding completely H7a by providing a valuable interpretation.

Two additional indirect relationships were found. Self-redemption was associated with generalized trust through self-exploration, namely, greater self-redemption may enhance self-exploration that in turn enhances considerably generalized trust ($\beta = .394$, $p = 0.001$). Self-redemption was associated with particularistic trust through self-exploration, namely, greater

self-redemption may enhance self-exploration that in turn enhances considerably particularistic trust ($\beta = .467, p = 0.003$).

- *Self-exploration*

Self-exploration was associated with greater acceptance (path coefficient = $.76, p < 0.001$), providing support for H7b. Moreover, three further direct relations were found showing that self-exploration was significantly associated with generalized trust (path coefficient = $.64, p < 0.001$), particularistic trust (path coefficient = $.76, p < 0.01$) and fun and role-play (path coefficient = $.82, p < 0.001$).

Additional indirect relationships were found. Self-exploration was associated with trust through generalized trust, namely, greater self-exploration may enhance generalized trust that in turn enhances remarkably trust ($\beta = .318, p = 0.003$). Self-exploration was associated with trust through particularistic trust, namely, greater self-exploration may enhance particularistic trust that in turn enhances trust ($\beta = .160, p = 0.034$).

- *Fun and role-play*

As expected, fun and role-play were associated with lower generalized trust (path coefficient = $-.42, p < 0.01$), supporting H6. Additionally, a direct association found, showed that fun and role-play were also correlated with lower particularistic trust (path coefficient = $-.74, p < 0.001$).

Additional indirect relationships were found. Fun and role-play were associated with trust through generalized trust, namely, greater fun and role-play may reduce generalized trust that in turn reduces trust ($\beta = -.207, p = 0.007$). Fun and role-play were associated with trust through particularistic trust, namely, greater fun and role-play may reduce particularistic trust that in turn reduces trust ($\beta = -.157, p = 0.028$). Besides being significantly related to generalized and particularistic trust directly, fun and role-play were associated indirectly to trust through these variables.

5.1. DISCUSSION

The structural model showed support for 15 paths out of the 17 initially proposed, whereas three had an opposed influence than supposed, giving a valuable hint for a different perspective on the related topic. The results order is maintained in the discussion session, however the constructs of the motivations behind identity's choice are presented together in order to provide a logical interpretation.

Success of the virtual world

As expected, the VW's use and trust were significantly associated with the overall success of the virtual world, therefore supporting the appropriateness of the model for interpreting the dual nature of the virtual world: technological and social. However the virtual world's use had a stronger relationship with the overall success of the virtual world, compared to trust. This can be explained by the fact that the success of the virtual world as a technology depends on the sociability that the technology can enable and on the usability (Preece, 2001). Therefore the virtual world's use includes already part of the need for socialization of residents which is also satisfied by the level of trust among individuals.

Amended Seddon Model

The Amended Seddon Model proved to be suitable to study the success of the virtual world as a technology. All constructs were significantly associated as in the original study (Rai, Lang & Welker, 2002), excepted for VW's use that was found being significantly associated with lower perceived usefulness. The virtual world's use was measured by the VW's dependence therefore it indicated that being dependent on the virtual world was correlated negatively with its perceived usefulness. Those individuals having a business in-world spend their time online wisely, those individual having a dependency on virtual world instead, make a non-optimal use of their time, translating in a lower perceived usefulness of the virtual world. Moreover a dependency is rarely considered positively. As a resident admit: *"I was an SL junkie 2003-2004 easily spending 40 hr/week; I have since then lost my passion"*.

Generalized and particularistic trust

As expected, generalized trust was associated to larger trust compared to particularistic trust, supporting the belief of Steinkuehler and Williams (2006) claiming that virtual third

places are suitable for bridging social capital, namely, to connect strangers. Emotional closeness and intimacy take more time to develop.

Exposure to supplementary personal details, identity equality and generalized/particularistic trust

The exposure to supplementary personal details about the real identity was found unexpectedly being correlated with lower equality. As a resident claims: “*Their RL and online identities being the same or otherwise wouldn't really be the issue as they talked to me about themselves in both*”. Or another: “*I have found that people who refrain from discussing RL are more genuine and trustworthy than those who create an intricate story of RL along with Facebook link. After much experience here, I've discovered the knowledge of RL offers absolutely zero to relationships here and can actually destroy them*”. The amount of personal information disclosed was not associated with greater equality, as revealed by the netnography for immersionists real world information was not adding value.

As expected, equality was significantly associated to generalized and particularistic trust. As discussed in the literature review, disclosing personal details of the real life is interpreted by people as a trusting behavior, which in turn calls for reciprocation. Self disclosure enhances closeness among individuals, thus intimacy. Therefore disclosing information about the real identity is associated similarly with generalized and particularistic trust.

Acceptance of the proposed identity, self-redemption and self-exploration

Two paths were not significantly related, therefore they were removed. The first removed path was connecting the exposure to supplementary personal details to acceptance of the proposed identity (H8b). More evident differences were expected in the responses given by the subgroups that were exposed to the two modified version of the simulated story. A possible explanation can be associated to the vagueness of the question or to the excessive interpretation of the story by the respondents.

The second removed path was the association of acceptance of the proposed identity with particularistic trust (H7c). An interesting hint can be found in the violation of the Hp7a: a positive association was expected to be found between self-redemption and acceptance. Therefore if disclosing sensitive information about a social problem, for instance, does not lead to greater acceptance, it is unlikely that it will lead to particularistic trust in turn, because it probably failed to create emotional closeness, necessary to strengthen existing ties. Simply

talking about personal problems was associated to lower acceptance, maybe because it was understood as a form of escapism from reality and the problem in question.

A valuable interpretation is provided by the indirect effect found that showed that self-redemption was associated to acceptance through self-exploration. When a person affected by social, psychological or health problems went through a phase of introspection and self-exploration in the virtual world, then it gained acceptance. There is support for this interpretation in the direct association found indicating that self-redemption was associated with greater self-exploration. Introspection helps understanding and overcoming one's weaknesses and personal problems, thus reducing escapism. Self-exploration permitted to find a link even among self-redemption and generalized and particularistic trust.

Self-exploration had a strong significant association with acceptance of the proposed identity. When the motivation for not revealing details about real identity was that the person preferred keeping the virtual world as a place for self-discovery and introspection, then the acceptance of the proposed identity was strong. Self exploration itself was significantly directly related to generalized trust and strongly to particularistic trust and in turn, indirectly to trust. The self-exploration motivation behind real and virtual identity's discrepancy, led to stronger relationships with generalized and particularistic trust than the disclosure of real identity information found in identity equality.

Self-exploration and Fun/role-play

Self-exploration had a strong significant association with acceptance but also to fun and role-play. This suggests that not always the self-exploration motivation behind the discrepancy between real and virtual identity is accepted, it can be interpreted as a false claim, thus redirecting to the category of the cheaters.

As found in the literature, anonymity and the disinhibition effect can lead to self disclosure, intimacy, emotional closeness, but also to malign disinhibition causing unethical behaviors. Creating a presence in a virtual world for having fun and playing a role is very commonly associated with bad intentions. This reading is supported by direct paths showing that fun and role-play were associated with lower generalized and particularistic trust and consequently indirectly to lower trust through generalized and particularistic trust. The major effect on particularistic trust can be interpreted as deriving from the betrayed expectancies that were created through the initial intimacy and emotional closeness developed.

6. CONCLUSIONS

Contributions

This study makes important contributions to the literature. First, it extends previous research on identity, trust in virtual communities and information systems' success. The contributing valence of this study lies in creating a model that connects together constructs that previously were mainly analyzed individually.

Second, studying the virtual world with an insider view was valuable for gaining insights on the online culture and a deep understanding of the problematic and issues discussed on forums and blogs that were investigated for conducting the netnographic research.

Third, the netnography and the literature allowed identifying the dual nature of the virtual world, technological and social, and the two subcultures: the immersionists and augmentationists. Therefore to analyze virtual worlds it is important to account for the fact that augmentationists consider them tools, while for immersionists they are places. Even though this distinction is not always net, it becomes meaningful when setting a research in virtual worlds and consequently for interpreting the findings.

Finally, using a flexible method as the Structural Equation Modeling proved to be valuable for studying virtual worlds because it allowed looking beyond the proposed conceptual model to find alternative explanations and new directions for understanding the complexity of the new environment.

Success of the virtual world

The success of the virtual world ultimately lies in the understanding of its peculiarities: social and technological. High levels of trust among individuals strengthen the virtual world as a society while the success of the virtual world as a technology leads to its increased adoption. A strong virtual society means stronger reciprocity among members, social affiliation and self-sanctioning practices against unethical behaviors, which allow residents to enjoy socialization and collaboration with others. A performing and easy to use technology, on the other hand, facilitates its members to enjoy the online experience, understand the potentials the new environment offers and achieve personal objectives inworld.

Many companies, organizations and institutions failed to create a presence in-world because they did not understand that a virtual world is a society in its own terms, with a distinct culture. As a resident argues: "*The business people who don't get SL, who talk trash about findings (...) they're not inworld. The people who are, they understand that SL is a*

foreign market much like any other, and when you do business in one, you learn and respect their customs if you want to make a sale. The business and content creation communities get that, and I've never had anything but respect in them”.

Virtual world offer tremendous potentials both for individuals and businesses. On the social side, virtual worlds are the ideal places to listen to what Surowiecki (2004) calls the *wisdom of crowds*. The author argues that in a heterogeneous, decentralized system where individuals are independent, large groups with no expertise are smarter than few specialists. This collective wisdom can be beneficial for individuals as well as for institutions and organizations. It provides ideas, points of view, knowledge and new perspectives on problems. In economic terms, virtual worlds can be considered as what Anderson (2006) defines the *long tail* of the market. In a world with no geographical boundaries it is possible to tap into myriads of market niches, which is beneficial for the consumer as well as for the entrepreneurs.

Nonetheless, to achieve the virtual world's success, the technological aspect has to be properly addressed in order to provide the sociability and usability (Preece, 2001) necessary to fulfill residents' unique needs, both in an immersionism or augmentationism perspective. The platform need to be simplified and the performance implemented to reduce the learning curve and to meet also the needs of businesses.

Identity and trust

The results of the analysis suggested that the dual nature of virtual worlds (technological and social) and their two interpretations (as tools and places) are not only important for research purposes but they permeate every aspect of the new reality. Studying the motivations behind identity's choice proved to be valuable for understanding trust development in the virtual world but it also pointed out how the different perceptions augmentationists and immersionists have about the virtual world actually influence identity' choice and perception.

Real/virtual identity equality on one side and fun/role-play on the other side, are two extremes of a continuum which is dictated by immersionism and augmentationism. Self-redemption, self-exploration and fun/role-play taken together and opposed to equality can be useful to confront the different views. Identity discrepancy does not lead to lower levels of trust compared to disclosing real life details, on the contrary it asserts a stronger influence on particularistic trust, by creating emotional closeness and empathy.

Furthermore, an interesting outcome of the netnography was that coherence and integrity were considered fundamental when dealing with strangers in an environment characterized by

uncertainty. Personal disclosure is important to develop intimacy, emotional closeness and consequently trust, but coherence in residents' behavior and practices is what really provides cues one can ground trust on. As a resident claims: *For me, you are what you say you are until you prove otherwise. I watch for consistent, coherent behavior. (...) People's in-world history, behavior, and reputation matter a lot more to me than any claims of atomic world legitimacy*".

6.1. LIMITATIONS AND FUTURE RESEARCH

This paper presents some limitations that are worth considering in future research about virtual worlds. Limitations along with recommendations for future research are provided in each sub section.

Context

First of all, the context of study represents itself a limitation. The research was conducted solely on Second Life's residents. There are other social virtual worlds (e.g. IMVU, There, Kaneva, etc.), which might present differences in the organization, culture, in-world dynamics, focus and objectives. A broader research, that spans across different virtual environments simultaneously, would be more significant for the conceptualization and generalization on virtual worlds.

Measurements

The survey research might be biased by *common method variance (CMV)*, namely the variance explained is not solely originating from the relationships among constructs but also from the measurement method (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). A Herman one-factor analysis was performed to test whether one single factor accounted for the majority of variance in the data (Chang, Witteloostuijn & Eden, 2010). The exploratory factor analysis with Principal Axis Factoring extraction method and Promax rotation, showed that a single factor explained 15.57% of the total variance, while nine factors were accounting for 50.64% of the total variance and ten factors 52.1%. Two hints from the SEM's results suggest that the CMV was not severe: four paths with negative values were found and self-redemption presented a positive path with self-exploration and a negative path with acceptance of the proposed identity. Nonetheless, the parallel netnography conducted, provided continuous

feedbacks about the validity of the findings, reducing the eventual distortive effect of common method bias.

An additional limitation about the survey design regards the use of several one-item scales to measure constructs. The reason behind this choice lies in the exploratory nature of the model and in the willingness to create a light survey accounting however for the complexity of the model while not being time consuming, to avoid premature respondents drop outs. Especially, I avoided creating more items measuring the extensive motivations behind identity's choice in order to maintain some degrees of confidentiality with Second Life residents. Many residents provided positive feedbacks about the good design of the survey and the interesting research topic, along with comments stating their personal opinions about the topics covered. As a resident claims: *"this is an excellent questionnaire, it's not too personal and not at all very intrusive"*. Nonetheless, in future studies multi-items scales need to be implemented to improve the explanatory power of constructs.

Constructs

- Success of the virtual world as a technology

In this study, the success of the virtual world as a technology has been analyzed through the Amended Seddon Model. The detected level of perceived ease of use might be biased by the fact that the majority of respondents are characterized by people that succeeded in familiarizing with the virtual world even if they were still newbies, therefore they believed it was relatively easy to use. Users in the welcome area should be additionally addressed in future research.

Furthermore, when analyzing the success of the virtual world as a technology, also the success in the service provider should be included. In Second Life, Linden Lab does not only sanction users addressed in abuse reports, but also is in charge of the implementation and smooth running of the software.

- Trust

There are limitations regarding the exploration of trust in virtual worlds. As found in the literature, trust is really hard to measure and the scales used to measure trust need to be improved in general terms and specifically to address the peculiarity of virtual worlds. For instance, Glaeser et al. (2000) argue that in a community, individuals with a higher status are associated with higher levels of trust. A piece of information that is possible to collect from a

resident's profile is the registration date. It might be interesting to further study whether older members are considered having a higher status by newbies, and if these characteristics consequently lead to higher levels of trust towards them.

The same is valid considering newbies. There is a social pressure on newbies that forces them to adapt quickly to the social norms of the virtual worlds (Neustaedter & Fedorovskaya, 2009). Newbies are easy to spot because they are represented by default avatars. Having a customized avatar's appearance, gives sign of familiarity with the virtual reality. The authors argue that more experienced residents think that interacting with newbies equals teaching them how the virtual world works. Therefore, registration date and avatar's appearance could be used as predictors of residents' status.

Finally, virtual worlds bring together people with very different ethnic and cultural backgrounds. Many studies have shown how the level of trust diverges among different cultures. Virtual worlds should be considered as a new society transcending any geographical boundaries, where the level of trust is given by the collective sum of its residents' trust. Alesina and La Ferrara (2002), argue that by moving an individual with low level of trust to a community characterized by a high level of trust, it is likely that he will trust more. Individuals adapt to the new context, therefore it is important to take into consideration the specific culture of the virtual world when performing an analysis. Conducting a research as an insider participant in the virtual world is the most effective way to understand and conform to the specific culture and gain the respect of the residents together with their voluntary collaboration.

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APPENDIX A

The questionnaires differ solely on the section where alternative scenarios are simulated, questions 5a-b, 6a-b and 8a-b, marked in blue colour.

QUESTIONNAIRE 1:

1 A) In general, one can trust people

Totally Disagree 1 Slightly Disagree 2 Slightly Agree 3 Totally Agree 4

1 B) In these days you can't rely on anybody else

Totally Disagree 1 Slightly Disagree 2 Slightly Agree 3 Totally Agree 4

1 C) When dealing with strangers it is better to be careful before you trust them

Totally Disagree 1 Slightly Disagree 2 Slightly Agree 3 Totally Agree 4

How often does it happen:

2 A) that you lend personal possessions to your friends (CDs, books your car, bicycle etc.)?

Never 1 Seldom 2 Sometimes 3 Often 4 Very Often 5

2 B) that you lend money to your friends?

Never 1 Seldom 2 Sometimes 3 Often 4 Very Often 5

2 C) that you leave your door unlocked?

Never 1 Seldom 2 Sometimes 3 Often 4 Very Often 5

3 A) My avatar resembles my real appearance;

Strongly Disagree 1 2 3 4 5 Strongly Agree

3 B) My avatar's identity is **equal** to my real one and it is natural for me to behave as I usually do in real life; Strongly Disagree 1 2 3 4 5 Strongly Agree

3 C) Compared to real life, getting to know people in SL makes me more suspicious about what they tell me about themselves.

Strongly Disagree 1 2 3 4 5 Strongly Agree

The identity of my avatar is **different** compared to the real one because:

4 A) In this way I can show traits of my character that I'm not able to express in real life since in SL I feel less inhibited;

Strongly Disagree 1 2 3 4 5 Strongly Agree

4 B) In this way it is more difficult for others to associate me with my virtual self;

Strongly Disagree 1 2 3 4 5 Strongly Agree

4 C) I want to start a new life in SL just for fun and/or to play a bit;

Strongly Disagree 1 2 3 4 5 Strongly Agree

4 D) I'm not happy with my current life and I want to have a second chance for living;
Strongly Disagree 1 2 3 4 5 Strongly Agree

4 E) To see if others would accept my inner nature instead of the person I act every day in my real life with which I do not identify myself with.

Strongly Disagree 1 2 3 4 5 Strongly Agree

Please rate the following avatars in order of trustworthiness. The scale is:

7= very trustworthy

6= trustworthy

5= potentially trustworthy

4= neutral

3= potentially untrustworthy

2= untrustworthy

1= very untrustworthy

5 A) Profile A: Imagine you end up sitting next to avatar M.M. at a pub, he is a middle age man, ordinary dressed, somebody who doesn't stand out of the crowd. You start talking to him and discover something about his virtual identity: besides having many things in common, you both wish to start a business in SL and were looking for a partner to do it. He seems serious, very skilled and experienced. In addition, you find out that he prefers not to talk about his real identity. He tells you that he finds SL a very enjoyable and liberating experience. I can be who I really want to be, he says. I can be happy, he explains. In fact, his SL identity is the only identity he wants to be represented by.

- Given that these are all the information you can get about his real life, would you anyway trust this person as a partner to start a business with? Rate how much you are likely to trust this individual.

Very Untrustworthy 1 2 3 4 5 6 7 Very Trustworthy

6 A) Profile B: Imagine you meet avatar L.Q. at a party, she is a good looking, friendly and exuberant 28-year old girl. She tells you that in her real life she is a journalist and that even her outlook and behaviour in SL correspond to her real life. She then gives you the link to her Facebook profile, where she has posted some of her articles and her professional Curriculum Vitae.

- Do you trust that her real and virtual identities are equal? Rate how much you are likely to trust this individual.

Very Untrustworthy 1 2 3 4 5 6 7 Very Trustworthy

Profile C: Imagine that your passion in SL is to design clothes, but you didn't register your rights on your creations yet. You meet Z.A., a 35-year old woman who claims to be, both in real and virtual life, a successful agent in the fashion business with many important clients. She finds your creations really creative and she thinks you can make a lot of money by selling the rights to her influential contacts. She asks you the permission to copy the collection from your inventory in order to act as an intermediary between you and her clients.

7 A) Rate how much you are likely to trust this individual.

Very Untrustworthy 1 2 3 4 5 6 7 Very Trustworthy

7 B) Did you consider the potential risks that might occur if she registers the rights on your collection with her name and make money by selling them? Rate how much you are likely to trust this individual now.

Very Untrustworthy 1 2 3 4 5 6 7 Very Trustworthy

Profile D: There is a website www.rateSLavatars.com, where you can search for an avatar's rating based on an SL's experience that had him/her as one of the party involved

(objective ratings that exclude intentional defame). The scale ranges from 0% to 100%, where 0% characterizes an unreliable person while 100% indicates a highly recommendable one.

8 A) Looking back at Profile C, you run into Z.A.'s reputation rating which accounts for **95%**, answer again the following questions:

Rate how much you are likely to trust this individual.

Very Untrustworthy 1 2 3 4 5 6 7 Very Trustworthy

9 A) I am aware that in SL there are episodes of unfair behaviors like cheating and deceiving.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

9 B) I think the introduction of reputation metrics might discourage cheating and deception.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

10 A) I often do what I feel like doing without paying attention to others' feelings.

Strongly Disagree 1 2 3 4 5 Strongly Agree

10 B) I often feel sorry for people who look lonely in a gathering and try to talk with them.

Strongly Disagree 1 2 3 4 5 Strongly Agree

10 C) I am not too concerned about other people's worries.

Strongly Disagree 1 2 3 4 5 Strongly Agree

10 D) I feel like doing something for people in trouble because I can almost feel their pain.

Strongly Disagree 1 2 3 4 5 Strongly Agree

10 E) I try to put myself in other people's shoes.

Strongly Disagree 1 2 3 4 5 Strongly Agree

10 F) I believe society cannot be sustained unless we help each other.

Strongly Disagree 1 2 3 4 5 Strongly Agree

10 G) It doesn't matter whether a person is useful to me; my relationship with the person is important.

Strongly Disagree 1 2 3 4 5 Strongly Agree

11 A) Most people are basically honest.

Strongly Disagree 1 2 3 4 5 Strongly Agree

11 B) Most people are trustworthy.

Strongly Disagree 1 2 3 4 5 Strongly Agree

11 C) Most people will respond in kind when they are trusted by others.

Strongly Disagree 1 2 3 4 5 Strongly Agree

11 D) Most people are basically good and kind.

Strongly Disagree 1 2 3 4 5 Strongly Agree

11 E) Most people will behave accordingly when trusted by others.
Strongly Disagree 1 2 3 4 5 Strongly Agree

12) SL is easy to use.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

13) How adequately do you feel SL meets the objectives and needs of your “second life” (e.g. starting a business, make money, have a second opportunity in life, find new friends, etc)?
Inadequate 1 2 3 4 5 6 7 Adequate

14) Overall, are you satisfied with SL?
Dissatisfied 1 2 3 4 5 6 7 Satisfied

15 A) I am dependent on SL.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

15 B) I think that SL, as a communication medium and a “place to be” will become more popular in the future.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

16) On average, I spend approximately hours per week on SL.

- a) 0-9
- b) 10-19
- c) 20-29
- d) 30- 39
- e) more than 40

Real Life demographics (Optional)

17) Age:

18) Sex: F M

19) Please feel free to leave a comment:

QUESTIONNAIRE 2:

1 A) In general, one can trust people

Totally Disagree 1 Slightly Disagree 2 Slightly Agree 3 Totally Agree 4

1 B) In these days you can't rely on anybody else

Totally Disagree 1 Slightly Disagree 2 Slightly Agree 3 Totally Agree 4

1 C) When dealing with strangers it is better to be careful before you trust them

Totally Disagree 1 Slightly Disagree 2 Slightly Agree 3 Totally Agree 4

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- Given that these are all the information you can get about his real life, would you anyway trust this person as a partner to start a business with? Rate how much you are likely to trust this individual.

Very Untrustworthy 1 2 3 4 5 6 7 Very Trustworthy

6 B) Profile B: Imagine you meet avatar L.Q. at a party, she is a good looking, friendly and exuberant 28-year old girl. She tells you that in her real life she is a journalist and that even her outlook and behaviour in SL correspond to her real life.

- Do you trust that her real and virtual identities are equal? Rate how much you are likely to trust this individual.

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