# Social Capital in Second Life

Huvila, I.; Holmberg, K.; Ek, S. & Widén-Wulff, G.

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**Purpose:** Second Life is a user-created online virtual world, which is a place where people with shared interests can meet and be together and share information. The purpose of this study is to investigate whether Second Life communities foster and nurture social capital, whether social capital within Second Life is related to social capital outside the virtual world, whether some characteristics affect the likelihood of users having social capital, and whether some existing measure of social capital can be modified and used to study social capital in Second Life.
**Design/methodology/approach:** Study is based on a statistical analysis of data gathered in a web survey of a convenience sample (N=67) of Second Life residents. The social capital measure used was based on Bullen and Onyx, 1998.
**Findings:** Second Life is an environment that fosters the emergence of social capital. Residents, who consider themselves as producers, have higher levels of social capital than those, who consider themselves as non-producers. Having social capital within Second Life is unrelated to having social capital outside the virtual world. Consistency of the instrument proved to be excellent for measuring social capital within Second Life and good outside the virtual world.
**Research limitations/implications:** Small sample size and the composition of the research population limit the possibilities to generalise the findings.
**Practical implications:** Second Life is a potent environment for community building and collective action. Communities and collective action within Second Life cannot be based, however, on the social activity outside the virtual world.
**Originality/value:** The present study is the first systematic investigation of social capital in Second Life.

**Keywords:** social capital, Second Life, virtual worlds, communities, comparative studies, measures

**Type:** Research paper

# Introduction

Second Life (SL) is an online virtual world. It is user-created and social, and it reflects the users' activities and interests. For some it is a place for learning, education and sharing information. Others use it for escapism or for entertainment. It is a place where people with shared interests can find each other and online virtual communities can emerge on the basis of these shared interests. It is a place where relationships between people, and between avatars that represent them, are possible.

These relations and communities are also the places where social capital lies. The present paper discusses findings from an empirical study of social capital in Second Life. Data (N=67) for the study was gathered using a web survey with questions on Likert scale. The combined thoughts of Bourdieu (1985) and Putnam (1993) are used as a starting point to discuss the social capital of residents in Second Life and to compare their social capital in Second Life with their social capital outside Second Life. The aim of this study is 1) to investigate whether such communities may and do emerge within Second Life and 2) whether the emergence of social capital converges with social capital in communities outside Second Life, or in Real Life (RL), as the non-Second Life environment is often referred in Second Life contexts. Further, the present study sets to 3) explicate

whether some characteristics of the users affect their likelihood of having social capital. The final question is 4) whether some existing measure of social capital can be modified and used to study social capital in Second Life.

The relevance of studying social capital in Second Life is manifold. Social capital has been acknowledge as a suitable framework for studying information behaviour while it opens up relational, structural, and content dimensions related to sharing. Social capital refers to both norms and networks as facilitating collective action and encouraging cooperative behavior. Positive effects of having a high level of social capital is the availability of intellectual and knowledge resources through networks and through the relationships between individuals and social units. All dimensions of social capital are important for information sharing but different aspects are highlighted and underlined depending on the context (e.g. Widén-Wulff, 2007; Södergård 2007; Widén-Wulff, and Hall 2008). Social capital is the basis for collective action and it helps to understand what the foundation of the community is within Second Life, what the motivations to participate in it are and what is that people get for their participation. Coleman (1988) underlines the increasing significance of voluntary and spontaneous social organisation in the present society as a substitute to the earlier formal social structures such as families and communities. The question that has not been addressed in earlier studies is whether such communities may and do emerge within Second Life and how they differ from the communities outside Second Life. What is the role of social capital in an online community and in sharing online information.

The article begins with a short presentation of the virtual world Second Life, followed by an overview of research in social capital and a review of social capital related research related to virtual worlds. The article proceeds thereafter with a presentation of empirical material, findings, discussion of the most significant findings and finally ends with conclusions.

## Second Life

Second Life (www.secondlife.com) is a three dimensional digital world, a user created social virtual environment which reflects the users' activities and interests. The users, or residents, as the people inside this virtual world are called, have created everything that can be seen and experienced in Second Life. There are over 15 million registered users in Second Life and at any given time of the day or night, there are over 40 000 people logged into Second Life, sometimes even over 80 000 people.

Second Life is a social virtual world because it does not have any game like elements of goals that players are trying to achieve (Bartle, 2004). There's no *game over* in Second Life. The social interaction between the avatars and the people behind the avatars is the purpose of Second Life, and also its greatest potential and threat. The immersive nature of virtual worlds makes interactions between people richer than it could ever be on the browser based Web. Through the avatars people experience the virtual world and feel the presence of others. It is possible to transfer real life behaviour and experiences to the avatars and form some kind of bond to them. People guide the avatars and decide what they do, which results in avatars behaving in a very human way. An example of such behaviour is that avatars have a personal space (Friedman *et.al*., 2007). The spatial behaviour of avatars suggests that other social behaviour may also transfer to Second Life.

The immersive nature of Second Life has been proven beneficial, for instance, in distance education. Students who have participated in classes have experienced the presence of other students in a much more realistic way than in text based educational tools online (Holmberg and Huvila, 2007; 2008). Students have also experienced a decreased distance between them and the teacher, giving them an overall positive learning experience (De Lucia *et. al*., 2009). The immersive nature of Second Life has also been used in teaching about disorders like schizophrenia by

simulating the hallucinations experienced by patients (Yellowlees and Cook, 2006). Second Life is a place that can be used to create simulations for educational purposes and a place where students can make mistakes without any serious consequences (Boulos, Hetherington and Wheeler, 2007). Besides the educational possibilities of Second Life, it is also a place for social interactions, business and entertainment (Guest, 2007; Castronova, 2005; Kaplan and Haenlein, 2009).

There is an increasing body of research conducted both in and about Second Life. A lot of the research has focused on the educational possibilities of Second Life, but the virtual world and its residents have gathered interest also in other fields like Library and Information Science (Bell *et. al*., 2007; Hurst-Wahl, 2007; Ostrander, 2008).

## Social capital

Economic capital can be measured from the amount of money a person has or how big stock portfolio someone has. Human capital is formed by the skills and technical knowledge a person has and uses in labour. Social capital is in the structures of relationships between people. According to Bourdieu (1980) social capital is built from two components; the social relationship that an individual has and that gives access to the resources of these relationships, and the amount and quality of these resources. The people a person is connected to are the actual sources of social capital. The donation of social capital can happen because of an expected reciprocity in a relationship when the donor expects to receive some return on their investment or through solidarity that derives from ones identification in some group. These actions and reactions are not necessarily only actions between two people, but they can be deposits of social capital in a common pool of social structures and withdrawals by some other people from the same common pool. This leads to positive outcomes such as access to information or more effective sharing of information.

Although the notion of social capital is several decades old, social capital has risen to a remarkable prominence in social science research since the early 1990's (Woolcock and Narayan, 2000). The focus on sociological studies during the 1980's and early 1990's and also in the contemporary definitions of social capital has been on the possible benefit an actor might have for a deposit of social capital to a network (e.g. Coleman, 1988). Robert Putnam (1993) brought another viewpoint to the research of social capital when he defined social capital as "features of social organizations, such as networks, norms, and trust that facilitate action and cooperation for mutual benefit."

Social capital is often divided into different dimensions in order to map its benefits and outcomes (Nahapiet and Ghoshal, 1998). These dimensions give a holistic picture of how the social environment should support knowledge development and the achievement of personal and professional goals (Widén-Wulff, Ek *et al*., 2008). The *structural dimension* is often defined through network structures and the nature of the network ties between the actors. Social interactions in the structures are channels for information flows. Through these interactions an actor may reach different kinds of benefits and goals. The *relational dimension* is defined through trust, identity, and roles. In the relational dimension the underlying motives for sharing are stressed and in earlier studies it has been shown that the exchange of information in e.g. online environments is highly dependent on social relationships (Hall and Widén-Wulff, 2008). Trust is an important enabler to both motivating and using social technologies and needs to be integrated into this understanding. Trust is usually built over time (Mayer, Davis and Schoorman, 1995) and is not always possible in online environments. Finally, the *content dimension* is defined as shared goals, common experience, language, and knowledge. Shared meaning and collective knowledge are key aspects which are very visible in e.g. online worlds and social network sites where rules, boundaries, and norms are clearly created (Williams, Ducheneaut *et al*., 2008; Thelwall, to appear). The structural and relational dimensions are cornerstones for gaining social opportunities, that is the content dimension (Widén-Wulff, Ek *et al*., 2008).

One of the problems of the notion is, however, that in spite of its prominence it is a multidimensional phenomenon with strong contextual dependence and different levels of analysis (Woolcock and Narayan, 2000). Therefore it is unlikely that a single measure of social capital will be possible (Widén-Wulff, 2007, 46). According to Putnam, social capital could be measured by indicators such as social organisation, participating, volunteering, socialising and trust (Putnam, 2000). Woolcock and Narayan (2000), on the other hand, emphasise membership in communities and their norms and values. In an empirical study of local communities in New South Wales, Bullen and Onyx (1998, see also Onyx and Bullen, 2000) identified eight elements of social capital 1) Participation in the Local Community, 2) Proactivity in a social context, 3) Feelings of Trust and Safety, 4) Neighbourhood Connections, 5) Family and Friends Connections, 6) Tolerance of Diversity, 7) Value of Life, and 8) Work Connections. As an overview of the variety of different approaches, Widén-Wulff presents an illustrative compilation of a selection of the measures used in social capital research (Widén-Wulff, 2007, 47, table 4.1). This study uses an approach based on Bullen and Onyx (1998). Their study and the eight elements of social capital formed a basis for constructing the instrument for measuring social capital in the present empirical investigation.

## Social capital and virtual worlds

As pointed out before, social capital is an important premises for how societies function and how information sharing works in different kinds of groups and communities. The changes in Western societies during the last decennia and the emergence of a global network society have broken traditional communities and social bonds. Putnam writes about the decline of social capital in American society as a whole (Putnam, 1995). Coleman (1988) discusses social capital from a family and community point of view and underlines the need to substitute the earlier formal society with a voluntary and spontaneous social organisation, which can provide people with the social capital they need. Internet and the increasingly seamless forms connectivity brought by the social web and virtual worlds have provided new settings for the kind of informal socialising emphasised by Coleman. The new forms of social organisation inside these worlds form voluntary and spontaneous *virtual communities* that generate different kinds of capital; market capital, social capital (connections), and cultural capital (competencies and artefacts) (Malaby, 2006) of which social capital is of interest in this article.

Social capital has been studied in many kinds of virtual communities, such as virtual learning communities (Daniel, Schwier and McCalla, 2003; Södergård, 2007) and social networking sites (Ellison, Steinfeld and Lampe, 2007). Blanchard and Horan (1998) divide virtual communities in those that are created around or on an existing physical community and in virtual communities that are created on the basis of the on shared interests of the members. Boundaries that have separated real and virtual are fading and the social actors move more and more within and among different domains, converting forms of capital into one another (Malaby, 2006). In a study by Law and Chang (2008) they identified four technology-based social capital builders in public online communities. These were identity profiling, sub-community building, feedback mechanism, and regulatory practice. These artefacts facilitated the formation of social capital, which in turn motivated knowledge contribution in the online communities.

According to Blanchard and Horan (1998) social capital can increase in virtual communities that are based on existing physical communities. Putnam (1995) defined social capital as social relations or civic engagement through volunteering and showed that social capital had declined in the United States during the last decades. Putnam (2000) continues by arguing that the Internet may reverse the decline. According to Lin (1999) “we are witnessing a revolutionary rise of social capital, as represented by cyber-networks.”

Volunteerism has also been suggested to increase social capital in groups, as was the case of Internet Chess Club where volunteerism also was a key feature of the club’s business model

(Ginsburg and Weisband, 2002). By contributing to the content of the Internet club the users improved the features of the service; hence increasing the financial value of the group. Many of the success stories on the Web are based on user created content. Wikipedia for example relies completely on users to add and edit content. The same applies also for Second Life, as everything from buildings to social groups and from vehicles to experiences in Second Life are created by the users.

In an interview study of players in the multiplayer online game (World of Warcraft) it was shown how players formed different kinds of social networks in the game where rules, boundaries, and norms were formed. It was clear that social capital was created in the process where the players formed these social networks with different kinds of goals in mind (a wide range of practical benefits for accomplishing game goals). For players who knew each other from before the online game was an important way to maintain and pursue their relationships. For others it was also an possibility to bridging social capital (Williams, Ducheneaut *et al*., 2008). In summary, the research conducted so far shows that social capital can emerge in virtual communities and more specifically, in virtual worlds, but further research is needed to get a clearer understanding of the phenomenon. The majority of earlier research has focussed on communities with a given frame of reference whether it is topic of interest or fantasy game, instead of new open-ended user-created virtual worlds with a clear emphasis on socialising like Second Life that have increased in popularity in recent years.

# Material

The data was gathered using a web survey and analysed in SPSS 15.0 for Windows. The responents form a convenience sample recruited using email invitations posted on slrl and educators@secondlife.com mailing lists, personally to Finnish Second Life users, personally recruiting informants from randomly chosen areas in Second Life and using instant messages sent within Second Life to personal contacts of the authors.

The questionnaire consisted of a set of 74 questions. The questions are partially based on earlier surveys of Bullen and Onyx (1998), Nood and Attema (2006), NMC and EDUCAUSE (2007) and Holmberg and Huvila (2007; 2008). The survey used questions on a 5-point Likert scale. The first battery of questions was about demography and Second Life usage related topics. The second battery consisted of questions used to measure the social capital of the respondents in the physical world (in the survey explained and referred to as Real Life, i.e. outside Second Life). The third battery was composed of the same questions as the second one adapted to the Second Life setting in order to explicate the social capital of the respondents in that particular virtual world.

## *Real Life Demographics*

The majority of the 67 respondents included in the study were female (58%) and well off, almost one fourth had household incomes over €80000 and 76% lived in an owner occupied dwelling. 26% of the respondents were in the ages 18–35 years, 30% in the ages 36–45 years, 23% in the ages 46–55 years, and 21% were older than 55 year.

All of the respondents were college/university educated, 65% had a bachelor's or master's degree and 35% had a doctoral degree. A great majority (82%) spoke English as their first language. Apparently, due to the nationality of the authors, 11% of the respondents were native Finnish speakers. Other native languages represented in the sample are Danish, Hungarian, Portuguese, Spanish and English/Arabic.

The studied group is thus noticeably highly educated and comfortably well off if compared to any standard population in any country. This, together with the small sample size limit the

possibilities to generalise the findings. In comparison to earlier studies of Second Life, the material is not equally extraordinary even if it is plausible to expect that the used recruiting method is a likely source of bias towards highly educated respondents. Exact population statistics of the Second Life residents do not exist, but, e.g., De Nood and Attema (2006) surveyed a population of 246 Second Life residents with almost 50% having a university degree. According to the Linden Lab statistics from January 2007 the proportion of female residents was 41% (Guterman, 2007) in contrast to 58% of the present study.

## *Second Life Mapping*

Most of the respondents were relatively new to Second Life, 40% had been residents for half a year or less and 33% for 7–12 months. Hence, 27% had been members of the community for 13 months or more, and of these had only 6% been members for over two years. The mean and median were 10 and 7 months respectively. 21% spent 4 hours or less per week in Second Life, 44% spent 5–10 hours, 24% spent 11–20 hours, and 11% spent over 20 hours per week in the virtual community (mean=12 h/week, median=10 h/week). A huge majority (80%) declared that the gender of their avatar in Second Life was the same as in Real Life, while 8% had chosen to change gender. Furthermore, another 8% reported that they often changed gender and 5% declared that they did it sometimes.

14% of the respondents in the sample had a paid-for premium account and 52% had a free account, but had filled their payment information and bought Linden dollars, the currency used in Second Life. However, despite a large majority of the respondents were relatively well off in Real Life, the economic value of most of the possessions in Second Life was rather small; e.g., a good third of the respondents in the sample possessed no more than 1000 Linden dollars or less.

69% considered themselves as non-producers in Second Life, while 31% saw themselves mainly as producers who contribute something to the virtual world. Not surprisingly, there is a clear division of non-producers and producers what comes to duration of membership, time spent and possessions in Second Life (see tables 1a–c).

**Table 1a Producer/Non-producer in Second Life**

| | Months of membership in SL | | | |
|---|---|---|---|---|
| Producer/Non-producer in SL | -6 | 7-12 | 13- | Total |
| Producer | 22% | 28% | 50% | 100% |
| (percent of total) | 7% | 8% | 15% | 30% |
| Non-producer | 46% | 34% | 20% | 100% |
| (percent of total) | 32% | 24% | 14% | 70% |
| Total | 39% | 32% | 29% | 100% |

As described in table 1a producers have on average been residents of Second Life far longer than non-producers; 50% of the producers have been members for 13 months or more compared to 20% of the non-producers, while the membership of 46% of the non-producers has not lasted more than 6 months compared to 22% of the producers. The relationship is significant and rather strong (chi-square=6.059, d.f.=2, p=0.05).

**Table 1b Producer/Non-producer and Hours per Week in Second Life**

| | Hours per week in SL | | | | |
|---|---|---|---|---|---|
| Producer/Non-producer in SL | -4 | 5-10 | 11-20 | 21- | Total |
| Producer | 11% | 22% | 50% | 17% | 100% |
| (percent of total) | 3% | 7% | 16% | 5% | 31% |
| Non-producer | 28% | 47% | 15% | 10% | 100% |
| (percent of total) | 19% | 33% | 10% | 7% | 69% |
| Total | 22% | 40% | 26% | 12 | 100% |

Quite naturally, as table 1b shows, producers spend significantly a lot of more time in Second Life (chi-square=9.825, d.f.=3, p=0.02). When 67% of the producers spent 11 hours or more in Second Life during a week, the corresponding proportion among non-producers was 25%; and 28% of the non-producers spent 4 hours or less per week in comparison with just 11% of the producers.

**Table 1c Producer/Non-producer and Possessions in Second Life**

| | Possessions (Linden dollar) in SL | | | |
|---|---|---|---|---|
| Producer/Non-producer in SL | -1000 | 1001-25000 | 25001- | Total |
| Producer | 6% | 39% | 56% | 100% |
| (percent of total) | 2% | 12% | 18% | 32% |
| Non-producer | 45% | 39% | 16% | 100% |
| (percent of total) | 30% | 27% | 11% | 68% |
| Total | 32% | 39% | 29% | 100% |

However, the most striking difference appears regarding possessions (chi-square=12.595, d.f.=2, p=0.002). 56% of the producers possessed over 25000 Linden dollars compared to 16% of the non-producers. And vice versa: 45% of the non-producers category owned no more than 1000 Linden dollars or less, among producers the corresponding proportion was only 6%.

# Findings

On a general level, respondents were rather positive to Second Life. Particularly descriptors like interactive (4.4), engaging (4.3), global (4.3), social (4.2), fun (4.1) and educating (4.1) got high scores on a Likert-scale from 1 ("not at all") to 5 ("precisely"). Second Life was not considered to be frightening (1.7), realistic (2.7) or easy to use (2.8) (table 2).

**Table 2 Characteristics of Second Life**

| How well do you think the following characteristics de-scribe SL? Scale: 1 (not at all) – 5 (precisely) | Producer mean (variance) 1–5 | Non-producer mean (variance) 1–5 | Total mean (variance) 1–5 |
|---|---|---|---|
| Engaging | 4.7 (0.346) | 4.1 (1.042) | 4.3 (0.899) |
| Interactive | 4.7 (0.346) | 4.2 (0.910) | 4.4 (0.777) |
| Easy to use | 2.9 (1.399) | 2.7 (1.101) | 2.8 (1.175) |
| Realistic | 2.8 (0.418) | 2.6 (1.054) | 2.7 (0.849) |
| Social | 4.4 (0.382) | 4.0 (0.869) | 4.2 (0.742) |
| Global | 4.4 (0.663) | 4.2 (0.705) | 4.3 (0.688) |
| Fun | 4.4 (0.368) | 4.0 (0.846) | 4.1 (0.717) |
| Educating | 4.5 (0.640) | 3.9 (0.943) | 4.1 (0.903) |
| Disorganised | 3.4 (1.850) | 3.6 (0.913) | 3.5 (1.162) |
| Frightening | 1.8 (1.124) | 1.6 (0.797) | 1.7 (0.884) |
| Inspiring | 4.2 (0.816) | 3.5 (0.955) | 3.7 (1.025) |

On the whole, producers scored higher than non-producers, i.e., they paint a more attractive and positive picture of Second Life. The differences are particularly pronounced on the descriptors inspiring (0.7, F=7.823, p=0.007), engaging (0.6, F=5.158, p=0.03) and educating (0.6, F=4.155, p=0.05). The differences regarding interactive (0.5, F=3.324, p=0.07), social (0.4, F=2.146, p=0.15) and fun (0.4, F=1.816, p=0.18) are also considerable. Emblematic is also that disorganised is the only descriptor where non-producers scored higher than producers (table 2).

Not surprisingly, reflecting the exceptionally high educational level of the respondents, learning (4.4) was by far the strongest motive for participating in Second Life. The second and third strongest incentives were fun (3.6) and inspiration (3.3) respectively. Learning, fun and inspiration were in fact the only motives that exceeded the median value (3.0) on the five-point Likert-scale ranging from 1 ("not at all") to 5 ("one principal motivation"). On the other hand, in this study, sex (1.5), real life doesn't please enough (1.4), dating (1.2) and disability hampers real life (1.2) were negligible as motives for participating in Second Life (table 3).

**Table 3 Motivations to participate in Second Life**

| Motivations<br>Scale: 1 (not at all) –<br>5 (one principal motivation) | Producer<br>mean (variance)<br>1–5 | Non-producer<br>mean (variance)<br>1–5 | Total<br>mean (variance)<br>1–5 |
|---|---|---|---|
| Fun | 3.4 (1.632) | 3.7 (1.113) | 3.6 (1.261) |
| Making friends | 2.9 (1.703) | 2.8 (1.251) | 2.8 (1.372) |
| Inspiration | 3.7 (1.721) | 3.1 (1.923) | 3.3 (1.895) |
| Doing something I can't do in RL | 2.8 (1.691) | 3.0 (2.053) | 2.9 (1.922) |
| Learning | 4.5 (1.015) | 4.4 (0.804) | 4.4 (0.852) |
| Pastime | 3.1 (1.485) | 2.6 (1.507) | 2.8 (1.535) |
| SL adds something to my life | 3.6 (1.556) | 2.5 (2.038) | 2.9 (2.075) |
| Business, I earn money in SL | 2.6 (2.132) | 1.6 (0.786) | 1.9 (1.380) |
| Sex | 1.6 (0.840) | 1.4 (0.632) | 1.5 (0.691) |
| Excitement | 2.3 (1.882) | 2.1 (1.124) | 2.2 (1.349) |
| Meeting RL friends online | 2.6 (2.369) | 2.5 (2.033) | 2.6 (2.102) |
| Improving my social skills | 2.3 (1.971) | 2.0 (1.368) | 2.1 (1.537) |
| Experimenting with roles | 2.3 (1.810) | 2.0 (1.459) | 2.1 (1.549) |
| RL doesn't please me enough | 1.4 (1.203) | 1.4 (0.775) | 1.4 (0.891) |
| Dating | 1.2 (0.279) | 1.2 (0.204) | 1.2 (0.222) |
| Disability hampers me in RL | 1.2 (0.529) | 1.2 (0.309) | 1.2 (0.668) |

Regardless of to which category – producer/non-producer – the respondents belonged, the motives for participating in Second Life were relatively consistent in the studied sample. On four of the variables the differences were remarkable though; producers scored much higher on inspiration (0.6, F=1.937, p=0.17), pastime (0.5, F=2.197, p=0.14), Second Life adds something to life (as much as 1.1, F=6.515, p=0.01) and business, earning money in Second Life (1.0, F=9.518, p=0.003) (table 3). Responses to an open question revealed that the most common ways of earning money in Second Life were camping (N=7), creating objects (e.g. skins, hairs, furniture, pets, jewellery) for sale (N=7), scripting and building (N=7), real estates (N=6) and from participating in surveys (N=3).

Random wandering was the most common general activity in Second Life, merely 5% of the respondents stated that they had not. Other popular activities were meeting new people (86%), listening to presentations, lectures and talks (80%), sightseeing (80%) and shopping (78%). Some residents had also taken part in voluntary work/charity (22%) and get-togethers (46%). A small majority owned property and worked on it and two-third of the respondents reported they had built things. 17% had been selling things they had created (table 4).

**Table 4 General activities in Second Life**

| General activity | Producer | Non-producer | Total | Significant difference |
|---|---|---|---|---|
| | Yes / No | Yes / No | Yes / No | |
| Participating in formal meetings | 100% / 0% | 56% / 44% | 69% / 31% | p=0.001 |
| Listening to presentations, lectures and talks | 94% / 6% | 73% / 27% | 80% / 20% | non-significant |
| Building things | 100% / 0% | 51% / 49% | 66% / 34% | p=0.000 |

| | | | | |
|---|---|---|---|---|
| Meeting new people | 100% / 0% | 80% / 20% | 86% / 14% | p=0.04 |
| Attending music/art performances | 83% / 17% | 61% / 39% | 68% / 32% | non-significant |
| Shopping | 100% / 0% | 68% / 32% | 78% / 22% | p=0.007 |
| Dancing | 78% / 22% | 56% / 44% | 63% / 37% | non-significant |
| Random wandering | 100% / 0% | 93% / 7% | 95% / 5% | non-significant |
| Owning property and working on it | 94% / 6% | 32% / 68% | 51% / 49% | p=0.000 |
| Selling things I created | 39% / 61% | 7% / 93% | 17% / 83% | p=0.003 |
| Sightseeing | 78% / 22% | 80% / 20% | 80% / 20% | non-significant |
| Participating in voluntary work/charity | 39% / 61% | 15% / 85% | 22% / 78% | p=0.04 |
| Participating in gettogethers | 61% / 39% | 39% / 61% | 46% / 54% | non-significant |

Producers are, as one could expect, more active than non-producers on every single variable but sightseeing, where the difference is marginal, though, just 2 percentage units. On the contrary, huge and statistically significant differences in favour of producers are to be found regarding participating in formal meetings, building things, meeting new people, shopping, owning property and working on it, selling things I created and participating in voluntary/charity work (see table 4).

The social capital of the respondents was measured using a double set of questions based on the questionnaire developed by Bullen and Onyx (1998). The first set of questions measured social capital in Real Life, while the second consisted of the same questions adapted to the Second Life environment. As in Bullen and Onyx (1998) study, the questions adapted for the present study measured social capital based on multiple elements of social life. All of the questions were measured on a five-point Likert scale with higher values indicating a higher level of social capital. The elements and questions used to measure social capital are reported in table 5.

**Table 5 Social capital measurements**

| **Questions (Likert Scale)** | **Element** | **Second Life** | **Real Life** |
|---|---|---|---|
| *Q1* | Participation in the local community | How many friends do you have in Second Life?<br>1 – 4 (1=0, 2=1-3, 3=4-10, 4=11-) | How many friends do you have in real life?<br>1 – 4 (1=0, 2=1-3, 3=4-10, 4=11-) |
| *Q2* | Value of Life | Do you feel valued by the society in Second Life?<br>1 (not much) – 5 (very much) | Do you feel valued by the society in real life?<br>1 (not much) – 5 (very much) |
| *Q3* | Participation in the local community | Some say that by helping others you help yourself in the long run in Second Life. Do you agree?<br>1 (no, never) – 5 (yes, very much) | Some say that by helping others you help yourself in the long run (in real life). Do you agree?<br>1 (no, never) – 5 (yes, very much) |
| *Q4* | Participation in the local community | Do you help out a group as a volunteer in Second Life?<br>1 (not at all) – 5 (often, at least once a week) | Do you help out a local group as a volunteer in real life?<br>1 (not at all) – 5 (often, at least once a week) |
| *Q5* | Feelings of trust and safety | Do you agree that most people can be trusted in Second Life?<br>1 (not much) – 5 (very much) | Do you agree that most people can be trusted in real life?<br>1 (not much) – 5 (very much) |
| *Q6* | Neighbourhood | Can you get help from your | Can you get help from friends |

| | | | |
|---|---|---|---|
| | connections | friends in Second Life when you need it?<br><br>1 (not at all) – 5 (definitely) | when you need it in real life?<br><br>1 (not at all) – 5 (definitely) |
| *Q7* | Participation in the local community | Have you attended an event arranged by a group you belong to in Second Life in the past six months (e.g., gettogether, meeting, performance, lecture)?<br>1 (not at all) – 5 (at least three) | Have you attended a local community event in the past six months (e.g., church fete, school concert, craft exhibition)?<br><br>1 (not at all) – 5 (at least three) |
| *Q8* | Participation in the local community | Are you an active member of a group in Second Life?<br><br>1 (not at all) – 5 (very active) | Are you an active member of a local organisation or club (e.g., sport, craft, social club)?<br>1 (not at all) – 5 (very active) |
| *Q9* | Family and friends connections | How many people did you chat with yesterday?<br>1 (none at all) – 5 (at least ten) | How many people did you talk to yesterday?<br>1 (none at all) – 5 (at least ten) |
| *Q10* | Neighbourhood connections | When you go shopping in the areas you visit often, are you likely to run into friends and acquaintances?<br>1 (not much) – 5 (nearly always) | When you go shopping in your local area, are you likely to run into friends and acquaintances?<br>1 (not much) – 5 (nearly always) |
| *Q11* | Neighbourhood connections | In the past six months, have you done a favour for a neighbour in Second Life?<br>1 (not at all) – 5 (frequently, at least five times) | In the past six months, have you done a favour for a neighbour?<br><br>1 (not at all) – 5 (frequently, at least five times) |
| *Q12* | Tolerance of diversity | Do you enjoy living among people of different life styles in Second Life?<br>1 (not at all) – 5 (definitely) | Do you enjoy living among people of different life styles?<br><br>1 (not at all) – 5 (definitely) |

In table 6a below we can see that the social capital variable (Q12) measuring open-mindedness, tolerance and curiosity got the highest mean score (4.3). This indicates that residents of Second Life have split vision – a result that is in line with the finding that learning was the strongest motive for participating in Second Life (see table 3). The "norm of reciprocity" (Gouldner, 1960) is also recognised and quite valued in the Second Life environment, since the mean score (4.2) of Q3 in table 6a is the second highest. This is vital for the future and long-term success of Second Life; according to the Social Exchange Theory, reciprocity in relationships is essential to functioning within any social context (Chiu, Hsu and Wang, 2006; Thibaut and Kelly, 1959; Wang and Wang, 2008). On the other hand residents of Second Life do not meet friends and acquaintances by chance very frequently (Q10, mean=1.6), and universal trust (Q5) does not seem to flourish either: 2.8 on the five-point Likert-scale, which is below the median value 3.

**Table 6a Social capital in Second Life**

| **Forms of social capital (Variables)** | **Producer mean (variance)** | **Non-producer mean (variance)** | **Total mean (variance)** |
|---|---|---|---|
| How many friends do you have in Second Life? *(Q1)* | 3.7 (0.353)<br>Scale: 1-4 | 2.7 (1.046)<br>Scale: 1-4 | 3.0 (1.035)<br>Scale: 1-4 |
| Do you feel valued by the society in | 4.1 (0.997) | 3.0 (1.805) | 3.3 (1.780) |

| | | | |
|---|---|---|---|
| Second Life? *(Q2)* | Scale: 1-5 | Scale: 1-5 | Scale: 1-5 |
| Some say that by helping others you help yourself in the long run in Second Life. Do you agree? *(Q3)* | 4.6 (0.369)<br>Scale: 1-5 | 4.0 (1.416)<br>Scale: 1-5 | 4.2 (1.137)<br>Scale: 1-5 |
| Do you help out a group as a volunteer in Second Life? *(Q4)* | 3.7 (2.330)<br>Scale: 1-5 | 1.9 (1.448)<br>Scale: 1-5 | 2.5 (2.436)<br>Scale: 1-5 |
| Do you agree that most people can be trusted in Second Life? *(Q5)* | 3.3 (1.154)<br>Scale: 1-5 | 2.6 (1.552)<br>Scale: 1-5 | 2.8 (1.492)<br>Scale: 1-5 |
| Can you get help from your friends in Second Life when you need it? *(Q6)* | 4.4 (0.868)<br>Scale: 1-5 | 3.8 (1.968)<br>Scale: 1-5 | 4.0 (1.640)<br>Scale: 1-5 |
| Have you attended an event arranged by a group you belong to in Second Life in the past six months? *(Q7)* | 4.7 (0.721)<br>Scale: 1-5 | 3.7 (2.369)<br>Scale: 1-5 | 4.0 (2.036)<br>Scale: 1-5 |
| Are you an active member of a group in Second Life? *(Q8)* | 4.7 (0.448)<br>Scale: 1-5 | 3.3 (2.703)<br>Scale: 1-5 | 3.7 (2.415)<br>Scale: 1-5 |
| How many people did you chat with yesterday? *(Q9)* | 3.2 (1.595)<br>Scale: 1-5 | 2.6 (1.821)<br>Scale: 1-5 | 2.8 (1.818)<br>Scale: 1-5 |
| When you go shopping in the areas you visit often, are you likely to run into friends and acquaintances? *(Q10)* | 2.2 (1.779)<br>Scale: 1-5 | 1.3 (0.335)<br>Scale: 1-5 | 1.6 (0.967)<br>Scale: 1-5 |
| In the past six months, have you done a favour for a neighbour in Second Life? *(Q11)* | 3.6 (2.134)<br>Scale: 1-5 | 2.4 (2.618)<br>Scale: 1-5 | 2.8 (2.721)<br>Scale: 1-5 |
| Do you enjoy living among people of different life styles in Second Life? *(Q12)* | 4.5 (0.618)<br>Scale: 1-5 | 4.2 (1.182)<br>Scale: 1-5 | 4.3 (0.991)<br>Scale: 1-5 |

In the Second Life setting, producers scored consistently higher than non-producers, i.e., producers possess, in general, a greater amount of second life social capital than non-producers. The differences are particularly large for "helping out a group as a volunteer" (Q4) and "active membership of a group" (Q8), 1.8 and 1.4 respectively (table 6a).

As shown in table 6b below, real life social capital was much more evenly distributed between those who are producers and non-producers in Second Life. There are not, in fact, any marked differences in mean scores on any single variable.

**Table 6b Social capital in Real Life**

| **Forms of social capital (Variables)** | **Producer in Second Life mean (variance)** | **Non-producer in Second Life mean (variance)** | **Total mean (variance)** |
|---|---|---|---|
| How many friends do you have in real life? *(Q1)* | 2.6 (0.369)<br>Scale: 1-4 | 2.6 (0.338)<br>Scale: 1-4 | 2.6 (0.341)<br>Scale: 1-4 |
| Do you feel valued by the society in real life? *(Q2)* | 4.3 (0.683)<br>Scale: 1-5 | 4.4 (0.688)<br>Scale: 1-5 | 4.3 (0.676)<br>Scale: 1-5 |
| Some say that by helping others you help yourself in the long run (in real | 4.8 (0.183) | 4.7 (0.272) | 4.7 (0.243) |

| | | | |
|---|---|---|---|
| life). Do you agree? *(Q3)* | Scale: 1-5 | Scale: 1-5 | Scale: 1-5 |
| Do you help out a local group as a volunteer in real life? *(Q4)* | 3.3 (2.118)<br>Scale: 1-5 | 3.0 (2.100)<br>Scale: 1-5 | 3.1 (2.093)<br>Scale: 1-5 |
| Do you agree that most people can be trusted in real life? *(Q5)* | 3.8 (0.536)<br>Scale: 1-5 | 3.3 (1.262)<br>Scale: 1-5 | 3.4 (1.078)<br>Scale: 1-5 |
| Can you get help from friends when you need it in real life? *(Q6)* | 4.5 (0.853)<br>Scale: 1-5 | 4.5 (0.556)<br>Scale: 1-5 | 4.5 (0634)<br>Scale: 1-5 |
| Have you attended a local community event in the past six months? *(Q7)* | 4.5 (1.265)<br>Scale: 1-5 | 3.6 (2.933)<br>Scale: 1-5 | 3.9 (2.561)<br>Scale: 1-5 |
| Are you an active member of a local organisation or club? *(Q8)* | 3.1 (3.235)<br>Scale: 1-5 | 2.9 (2.670)<br>Scale: 1-5 | 3.0 (2.789)<br>Scale: 1-5 |
| How many people did you talk to yesterday? *(Q9)* | 4.1 (1.163)<br>Scale: 1-5 | 4.3 (0.901)<br>Scale: 1-5 | 4.2 (0.968)<br>Scale: 1-5 |
| When you go shopping in your local area, are you likely to run into friends and acquaintances? *(Q10)* | 2.8 (2.265)<br>Scale: 1-5 | 3.2 (1.730)<br>Scale: 1-5 | 3.1 (1.888)<br>Scale: 1-5 |
| In the past six months, have you done a favour for a neighbour? *(Q11)* | 3.7 (2.095)<br>Scale: 1-5 | 3.3 (1.487)<br>Scale: 1-5 | 3.4 (1.685)<br>Scale: 1-5 |
| Do you enjoy living among people of different life styles? *(Q12)* | 4.4 (0.850)<br>Scale: 1-5 | 4.2 (0.845)<br>Scale: 1-5 | 4.3 (0.848)<br>Scale: 1-5 |

On the whole, table 6b resembles table 6a; i.e., the aggregated amounts of different forms of social capital (measured by mean values) in Real Life and Second Life are substantially on the same levels. There are large differences in favour of Real Life, though, on three variables: Q10 (diff. 1.5), Q9 (diff. 1.4) and Q2 (diff. 1.0). In Real Life the respondents are much more likely to run into friends and acquaintances while shopping (Q10), which reflects the number of casual encounters in everyday life; and consequently they also talk to (or chat with) more people in Real Life than in Second Life (Q9). Regarding Q2 the difference almost disappears by excluding the non-producers in Second Life from the analysis. In other words, those who produce something in Second Life feel that they on average are as much valued by the society in Second Life as they are in Real Life.

However, the social capital of peoples' 'two lives' does not converge to any substantial degree. Just on three variables significant relationships between second life and real life capital were found: very strong on Q5, "trust", ($r=0.63$, $p=0.000$) and Q12, "enjoy living among people of different life style", ($r=0.63$, $p=0.000$) respectively; and a weaker one on Q3, "helping others you help yourself", ($r=0.26$, $p=0.047$). Furthermore, the correlation between the aggregated social capital in Real Life and Second Life respectively even tends to be negative (non-significant though).

Although the relationships between second life and real life social capital were almost nonexistent, the internal correlations turned out to be strong, as tables 7a–b show.

**Table 7a Social capital in Second Life, correlations**

| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Q1 | r | 1 | .72* | .66* | .62* | .45* | .53* | .61* | .68* | .49* | .50* | .58* | .52* |
| | Sig. | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| Q2 | r | .72* | 1 | .61* | .66* | .52* | .57* | .63* | .70* | .50* | .48* | .71* | .36* |
| | Sig. | .000 | | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .006 |
| Q3 | r | .66* | .61* | 1 | .41* | .51* | .59* | .68* | .67* | .44* | .22 | .38* | .40* |
| | Sig. | .000 | .000 | | .001 | .000 | .000 | .000 | .000 | .000 | **.103** | .004 | .002 |
| Q4 | r | .62* | .66* | .41* | 1 | .33* | .44* | .48* | .52* | .58* | .63* | .54* | .20 |
| | Sig. | .000 | .000 | .001 | | .009 | .001 | .000 | .000 | .000 | .000 | .000 | **.133** |
| Q5 | r | .45* | .52* | .51* | .33* | 1 | .52* | .31^ | .50* | .31^ | .14 | .31^ | .25 |
| | Sig. | .000 | .000 | .000 | .009 | | .000 | .016 | .000 | .014 | **.289** | .021 | **.063** |
| Q6 | r | .53* | .57* | .59* | .44* | .52* | 1 | .48* | .65* | .52* | .25 | .49* | .27 |
| | Sig. | .000 | .000 | .000 | .001 | .000 | | .000 | .000 | .000 | **.070** | .000 | **.052** |
| Q7 | r | .61* | .63* | .68* | 48* | .31^ | .48* | 1 | .71* | .50* | .30^ | .53* | .21 |
| | Sig. | .000 | .000 | .000 | .000 | .016 | .000 | | .000 | .000 | .027 | .000 | **.120** |
| Q8 | r | .68* | .70* | .67* | 52* | .50* | .65* | .71* | 1 | .44* | .29^ | .58* | .35* |
| | Sig. | .000 | .000 | .000 | .000 | .000 | .000 | .000 | | .000 | .029 | .000 | .008 |
| Q9 | r | .49* | .50* | 44* | .58* | .31^ | .52* | .50* | .44* | 1 | .57* | .52* | .35* |
| | Sig. | .000 | .000 | .000 | .000 | .014 | .000 | .000 | .000 | | .000 | .000 | .008 |
| Q10 | r | .50* | .48* | .22 | .63* | .14 | .25 | .30^ | .29^ | .57* | 1 | .52* | .33^ |
| | Sig. | .000 | .000 | **.103** | .000 | **.289** | **.070** | .027 | .029 | .000 | | .000 | .017 |
| Q11 | r | 58* | .71* | .38* | .54* | .31^ | .49* | .53* | .58* | 52* | .52* | 1 | .22 |
| | Sig. | .000 | .000 | .004 | .000 | .021 | .000 | .000 | .000 | .000 | .000 | | **.110** |
| Q12 | r | .52* | .36* | .40* | .20 | .25 | .27 | .21 | .35* | .35* | .33^ | .22 | 1 |
| | Sig. | .000 | .006 | .002 | **.133** | **.063** | **.052** | **.120** | .008 | .008 | .017 | **.110** | |

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

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

Overall, the questions used to measure social capital in Second Life have a very high degree of internal consistency, since almost all the variables correlate significantly with each other to varying extents (table 7a). Hence the internal consistency reliability value for the 12 questions is also excellent (Cronbach's alpha=0.92). As we can see from table 7a, just Q10 ("When you go shopping in the areas you visit often, are you likely to run into friends and acquaintances?") and Q12 ("Do you enjoy living among people of different life styles?") deviate from the consistent pattern, 3 out of 12 and 5 out of 12 respectively (non-significant outcomes in bold).

**Table 7b Social capital in Real Life, correlations**

| | | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Q1 | r | 1 | .47* | .30^ | .27^ | .09 | .33* | .25 | .29^ | .18 | .32^ | .10 | .17 |
| | Sig. | | .000 | .016 | .028 | **.492** | .008 | **.051** | .022 | **.160** | .011 | **.449** | **.173** |
| Q2 | r | .47* | 1 | .35* | .28^ | .32* | .39* | .15 | .23 | .10 | .32^ | .31^ | .28^ |
| | Sig. | .000 | | .005 | .026 | .009 | .001 | **.247** | **.065** | **.416** | .013 | .012 | .022 |
| Q3 | r | .30^ | .35* | 1 | .31^ | .23 | .27^ | .23 | .21 | -.01 | .18 | .25^ | .26^ |
| | Sig. | .016 | .005 | | .013 | **.067** | .027 | **.075** | **.096** | **.958** | **.151** | .044 | .034 |
| Q4 | r | .27^ | .28^ | .31^ | 1 | .16 | .06 | .32^ | .46* | .26^ | .28^ | .23 | .29^ |
| | Sig. | .028 | .026 | .013 | | **.217** | **.620** | .012 | .000 | .034 | .025 | **.070** | .017 |
| Q5 | r | .09 | .32* | .23 | .16 | 1 | .13 | -.03 | .15 | -.03 | .05 | .08 | .22 |
| | Sig. | **.492** | .009 | **.067** | **.217** | | **.304** | **.832** | **.247** | **.787** | **.719** | **.544** | **.075** |
| Q6 | r | .33* | .39* | .27^ | .06 | .13 | 1 | .13 | .12 | -.08 | .29^ | .09 | .22 |
| | Sig. | .008 | .001 | .027 | **.620** | **.304** | | **.319** | **.333** | **.512** | .020 | **.493** | **.075** |
| Q7 | r | .25 | .15 | .23 | .32^ | -.03 | .13 | 1 | .62* | .13 | .31^ | .29^ | .25^ |
| | Sig. | **.051** | **.247** | **.075** | .012 | **.832** | **.319** | | .000 | **.313** | .015 | .022 | .048 |
| Q8 | r | .29^ | .23 | .21 | .46* | .15 | .12 | 62* | 1 | .16 | .31^ | .21 | .24 |
| | Sig. | .022 | **.065** | **.096** | .000 | **.247** | **.333** | .000 | | **.208** | .016 | **.098** | **.055** |
| Q9 | r | .176 | .10 | -.01 | .26^ | -.03 | -.08 | .13 | .16 | 1 | .44* | .43* | .26^ |
| | Sig. | **.160** | **.416** | **.958** | .034 | **.787** | **.512** | **.313** | **.208** | | .000 | .000 | .035 |
| Q10 | r | .32^ | .32^ | .18 | .28^ | .05 | .29^ | .31^ | .31^ | .44* | 1 | .37* | .32* |
| | Sig. | .011 | .013 | **.151** | .025 | **.719** | .020 | .015 | .016 | .000 | | .003 | .010 |
| Q11 | r | .10 | .31^ | .25^ | .23 | .08 | .09 | .29^ | .21 | .43* | .37* | 1 | .35* |
| | Sig. | **.449** | .012 | .044 | **.070** | **.544** | **.493** | .022 | **.098** | .000 | .003 | | .005 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Q12 | r | .17 | .28^ | .26^ | .29^ | .22 | .22 | .25^ | .24 | .26^ | .32* | .35* | 1 |
| | Sig. | **.173** | .022 | .034 | .017 | **.075** | **.075** | .048 | **.055** | .035 | .010 | .005 | |

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

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

The similar questions used to measure social capital in Real Life do not correlate as well as in the Second Life context, there are quite a few non-significant outcomes (in bold in table 7b). Q5 ("Do you agree that most people can be trusted…"), for instance, correlates significantly with merely one other variable (Q2: "Do you feel valued by the society…"). On the other hand, Q10 ("When you go shopping in your local area, are you likely to run into friends and acquaintances?") correlates significantly with every other variable but Q3 ("Some say that by helping others you help yourself in the long run. Do you agree?") and Q5 ("trust") respectively. The internal consistency reliability value for the 12 questions measuring social capital in Real Life is nevertheless good (Cronbach's alpha=0.76).

# Discussion

The findings show that Second Life is a profoundly social environment and it generates and contributes to the social capital of its residents. Socialising is a major motivation for participating in the environment and most of the frequent activities of the respondents relate to socializing with others. Second Life lies outside the frame of traditional formal organisations, it is based on unsolicited participation and it provides means to meet people, have fun, learn, work and to sense positive and negative social experiences. Reciprocal socializing is valued, but the contacts are less frequent and residents do not trust others in a universal manner. People are less likely to run into their acquaintances in Real Life than in Second Life. In this sense Second Life is such a spontaneous and voluntary community, or rather a compound of communities, Coleman (Coleman, 1988) suggested to be typical in the present society, where the significance of formal organizations, families and local communities is decreasing.

Another major finding is that the 'two lives' of the respondents converge very little. Considering the categorisation of virtual communities by Blanchard and Horan (1998), Second Life is based on shared interest than physical communities. Indeed, it can be seen as a counterpoint to socialising in physical world. The only significant relations (3 out of 12) between the variables measuring social capital in Real Life and Second Life relate to highly general notions of trust, acceptance of cultural diversity and reciprocity that are easy to conceive as more universal and less contextual preferences than social practices. In every other respect, including the aggregated social capital in the two environments, there are no relationships.

Residents participate in community activities, meet friends and interact in a variety of manners inside Second Life. The major aspects of motivation indicated by the respondents of the present study correlate with the earlier findings (e.g. Nood and Attema, 2006; Holmberg and Huvila, 2007; 2008). The prominence of learning as a motivation is not surprising because of the high educational level of the sample.

Respondents were also, in general, positive towards Second Life. Descriptors interactive, engaging, global, social, fun, and educating scored high. In contrast, Second Life was not considered to be frightening, realistic or easy to use. The findings are similar to earlier studies (e.g. Holmberg and Huvila, 2008). The descriptors (and the related motivations to participate in Second Life), which may be seen to complement rather than compensate real life interactions and experiences were typical motivations whereas motivations such as "Real life does not please me enough" were noticeably less prominent. One of the respondents captured the essence of the trend by writing that "I can do things in Second Life I cannot do in real life and I can do things in real life that I cannot do in Second Life. It is not all about Second Life".

The third major finding was the magnitude of the difference between those respondents who considered themselves to be producers, and those who saw themselves as non-producers. Earlier studies present some evidence of the differences between these two groups in gender, Real Life profession and time spent in Second Life (Nood and Attema, 2006), but the present findings indicate rather profound split between the groups. Producers had been residents longer and were more positive towards Second Life than non-producers. Higher scores in inspiration, engaging, educating, social and fun indicate that the producers are more engaged in the social ecosystem of Second Life. They also scored higher also in social capital variables, especially in "helping out a group as a volunteer" and "active membership" suggesting of volunteerism that has been suggested to increase social capital (Ginsburg and Weisband, 2002). The findings follow the face-value logic that longer participation increases social capital. Producers also participated in Second Life noticeably more than non-producers to get inspiration, as a pastime activity and especially because Second Life adds something to life and offers possibilities to do business and earn money in Second Life. The difference between the groups is underlined by the fact that non-producers scored higher only by perceiving Second Life as disorganized. Sensations of disorganization can be taken as a clear indication of less familiarity with the environment and also of a shallower engagement in the virtual world.

In spite of the noticeable difference between the two groups, the motives for participating were relatively consistent. The appeal and opportunities in Second Life are similar. When considered together with the differences related to the level of engagement in production and non-production, the subtleties of Second Life and Real Life are related to social aspects rather than to the virtual world *per se*. As one of respondents put it, "Second Life is a microcosm of all that is humanity and the human experience, both good and bad". The whole spectrum of humanity and humaneness is present in Second Life, but it is organized, mediated and encountered in different kinds of social networks than in Real Life.

The fourth and final major finding of the study concerns the validity of the 12-item social capital measurement instrument based on Bullen and Onyx (1998). In Second Life variables, the internal consistency of the questions is high with almost all variables correlating with each other and showing an excellent consistency reliability value (Cronbach's alpha=.92). In Real Life questions, the consistency is also good (Cronbach's alpha=.76) even if not as good as in Second Life. This can be seen as an indication of more homogenous patterns of social life in Second Life in comparison to Real Life. Nevertheless, the consistency of the results demonstrates the validity and usability of the instrument for measuring social capital in Second Life and comparing it to Real Life social capital.

In summary, Second Life has clearly all the elements for generating and fostering social capital mentioned by Putnam (1993) although the existence of social capital in Second Life and Real Life respectively do not converge. Residents form networks and have friends they meet in Second Life and more they engage in 'production', more they have social capital. There are clear codes of conduct and behaviour expressed in form of positive and negative experiences of behaviour. The mechanisms of trust are mostly based on judgments made on social behaviour rather than on Second Life specific indicators such as the type of the account of the other resident. In terms of Bourdieu (1980), Second Life gives access to extended social networks beyond the real life and as the findings indicate, increases both the amount and quality of these connections.

The present study is limited by the relatively small sample with an unknown bias. Survey of the comprehensive demographics of the resident population of Second Life would be highly valuable for any forthcoming study on that particular virtual world and on virtual worlds in general. A larger scale study and case studies on considerably different samples of residents are needed to understand the nature of social capital in Second Life. Further, it would be fruitful to look at the various

dimensions of social capital discussed in the literature within Second Life. Finally, the proposed instrument of measuring social capital in Second Life needs further testing.

The emergence of social capital in Second Life has several implications from the information point of view. The existence of social capital has been shown to be important in engaging users to make significant contributions in virtual communities. Existence of social capital can be seen as an indicator of a success of information sharing online, and simultaneously the understanding of social capital and its formation can be used to understand why some collaborative efforts of sharing information and constructing common knowledge resources succeed and other fail. In practice, because Second Life appears to be a fruitful environment for nurturing social capital, it has potential to function as a venue for information sharing. The existence of social capital leverages information sharing independent of the nature or specifics of information. The central finding of the present study that social capital in Second Life and Real Life do not converge significantly, underlines that is important that the practices of information build on the social codes and structures present in the virtual world and not on practices borrowed directly from the Real Life. Because of the lesser likelihood of casual encounters, it is important to focus on active building of information sharing networks. Further, the difference in the levels of social capital between producers and non-producers suggest that deeper engagement in the environment is a key to more successful information sharing. Both tools and social practices directed to increase and accelerate engagement in the Second Life can be suggested to have a positive effect on the level of social capital and consequently on the functioning and effectiveness of information sharing. Future studies, both quantitative with different and larger samples and qualitative, are needed for a more elaborate understanding of the aspects of social capital and how it affects information sharing practices in Second Life and in virtual worlds in general.

## Conclusions

The results indicate that socialising is a major motivation for participating Second Life and Second Life is an environment, which fosters the accumulation of social capital. Most of the activities the respondents mentioned they had participated were meetings, get-togethers, conferences or casually meeting people and colleagues, all occasions of sharing information. Another finding of the study is that the variables measuring social capital in Second Life and in Real Life did not converge almost at all indicating of a clear difference in socialising between the two environments. In Second Life, there was a significant difference between those respondents who considered themselves to be producers and those who did not. Producers scored higher in social capital measures and were significantly more engaged in social interactions in the virtual world. Finally, the instrument used to measure social capital in Second Life and Real Life proved its value. The consistency of measures was good in Real Life context and could be deemed as excellent in Second Life.

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