

3D Communities as Platforms for Developing Social Capital

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Abstract: 3D virtual communities, a particular form of platforms, have gained remarkable attention in theory and practice. Similarly, the well established concept of social capital, which describes resources becoming accessible and available through the connection and interaction between individuals on a platform, has regained prominence with the boom of social media. In this study, we investigate the development of social capital in 3D virtual communities. Adapting the model of Adler and Kwon (2002), we analyze the role of motivation, ability, opportunity, and integration for constituting social capital in 3D virtual communities. Our empirical investigation conducted in 2008 and 2009 among users of two 3D virtual communities, one networking platform and one online gaming platform, suggests that only motivation and ability are generally important. We conclude that the sources of social capital depend on the specific type and user audience of a 3D virtual community as well as on the sophistication of the available tools in the particular 3D environment and the cultural openness of the network.

1 INTRODUCTION

Facebook, YouTube, MySpace, Flickr are only some of the communities present on the Internet these days. The number of virtual communities in general, and of 3D virtual communities in particular, which is available to the regular Internet user is exploding. Whereas some people in virtual spaces only come together to have fun and do small talk, many join virtual communities looking for different kinds of help in their daily life. Purposefully or not, they create social capital by interacting with others online; the social capital in turn, just as other types of capital, then may increase a person's productivity (Becks et al., 2004).

In this paper, we investigate what drives the development of social capital in 3D virtual communities. To that end, the remainder of the paper is structured as follows: In the next section, we briefly outline the concept of 3D virtual communities and describe two examples, Cyworld (CW), which resembles more a networking platform, and SecondLife (SL) appearing to be closer to an online gaming platform. We then introduce the concept of social capital. Subsequently, we develop our research model adapted from Adler and Kwon (2002). We present the approach and the results or

our empirical study. We discuss our results focusing on their implications for theory and practice. At the end, we summarize and provide some suggestions for future research.

2 TERMS AND CONCEPTS

2.1 Virtual Community

The term 'virtual community' as a community of the Internet is rather broad. According to Preece (2000) an online community consists of socially interacting people who come together in the community for a shared purpose. Policies determine daily life in the community and all this is supported by computer systems. Hagel and Armstrong (1997) argue that people register for virtual communities and use them because they are looking for a space that they feel comfortable in and which gives them the chance to meet other people. To them, interaction in a virtual community is based on four basic needs: interest, relationship, fantasy, and transaction. Lee et al. (2003, p. 51) define a virtual community as "a cyberspace supported by computer-based information technology, centered upon communication and interaction of participants to

generate member-driven contents, resulting in a relationship being built up". They see four basic elements of virtual communities: (1) Existence in cyberspace, (2) use of computer-based information technology, (3) concentration on communication and interaction with the focus on content-driven by participants and (4) relationships. Different from Hagel and Armstrong (1997), they do not include the 'fantasy' aspect.

We distinguish a variety of communities which depend on different technological structures. Smith and Kollock (1999) distinguish six types: (1) eMail and discussion groups, (2) Usenet and BBS's (Bulletin Board Systems), (3) text chat, (4) multi-user domains or dungeons, (5) www sites, and (6) graphical worlds. Graphical worlds are similar to the 3D worlds, which are at the focus of this study. Other virtual community types include online games (Hsu and Lu, 2004; Wu et al., 2008). They fulfill the fantasy aspect and typically resemble the multi-user dungeons with more graphical and multimedia features. Porter and Donthu (2008) distinguish virtual communities serving market research or customer communication needs of a particular company and those encouraging customers to share personal information with the firm, cooperate in new product developments, or become loyal customers. The most prominent form of virtual communities are social networking sites (Dwyer et al., 2008) such as Facebook, MySpace, and Flickr. Offering a combination of digital communication and publishing, they emerged from the Web 2.0 trend.

Specific to 3D virtual communities is the use of avatars, that are "three-dimensional and typically, but not exclusively, anthropomorphic representations of people, including related in-world behavior and paraphernalia, for the purposes of interaction within virtual worlds" (Barnes and Mattson, 2008, p. 197). Tools are available to the user; images, sound and models of spaces, the latter are three-dimensional real-time video and audio tools are often integrated as well as text chat.

Cyworld (CW) such a 3D virtual community similar to sites like Facebook, perhaps with a more realistic design (The McGraw-Hill Companies, 2005). Homepages are three-dimensional with the ability to decorate a rather bare mini-room on the personal page with furniture, art or music by paying for virtual items. Inside the room 'lives' the personal avatar of each individual user, the so-called 'mini-me' (Dong-Hee and Won-Young, 2008). The homepage includes a photo gallery, message board, guestbook, and personal bulletin board. Members can join a variety of groups or 'clubs' and discuss

topics and ideas via 'talk threads'. The currency is called 'acorn' and is the equivalent of 0.10 US Dollars. The 3D community was launched 1999 in Korea (Kanellos, 2006). It really took off Korea's largest wireless service provider SK Telecom took over in 2003. CW Europe opened in 2006 and closed in 2008.

Second Life (SL) is a 3D virtual world with mountains, oceans, cities with houses and streets and with a virtual sky. It is operated by Linden Lab, founded in 1999. Users are represented by avatars and guided by the members via their computers. The currency, Linden Dollar, is pegged to the US Dollar. With Linden Dollars, residents can make all kinds of transactions on the platform. SL has also been used as an educational channel. It offers like-minded people the chance to find each other and to attend virtual events or play games in SL. Users create everything in the virtual world themselves, from the cars they drive virtually to the streets they drive on (Ondrejka, 2004/2005). They create landscapes and items in real-time and share the creation itself as well as the act of creation with each other. This fosters interpersonal bonds between them.

SL is more complex than CW offering vaster graphical tools and allowing users to be more creative. However, those opportunities make it also harder to use for new users.

2.2 Social Capital

Social capital stands for a variety of approaches and definitions. There are several differences as to what the sources of social capital are, what types of social capital exist, and what it can be used for (Bourdieu, 1986; Coleman, 1990; Putnam, 2000; Lin, 2001). In any case, social connections between individuals have to exist for social capital to develop. These connections enable resources for the individuals and the group. Individuals make investments in social relations. The maintenance of these relations is necessary to ensure social capital. Norms, trust, and reciprocity are important preconditions for the social relations, thus social capital, to render benefits.

In this paper, we build on Lin's (2001, p. 19) definition of social capital as "a social asset by virtue of actors' connections and access to resources in the network or group of which they are members". Social capital is used in the same context as social networks (Lin et al., 1981a; Lin and Dumin, 1986), explicitly using the term 'tie', which refers to the structure of a network.

Social capital is a collective of personal resources and social resources that lie in the

connections and can be accessed through them (Lin and Dumin 1986). Personal resources, such as one's wealth, status, and power, belong to the individual who decides how to use them (Lin et al., 1981a). Social resources are accessible through the ties in a network; they are temporary and borrowed. Examples are wealth, status, and power of the people with whom one is linked (Lin et al., 1981b).

For social capital to exist and grow, requires investments in social relations (Lin, 2001).

Lin (2001) puts forward several benefits derived from social capital: The flow of information is facilitated. Social ties may lead to influence on agents who are important decision makers, e.g., recruiters for jobs. Social ties can serve as 'social credentials' by a third party building reputation. Social ties strengthen identity and recognition, and thus act as reinforcements. They provide emotional support to individuals by helping them to find like-minded people in society. They also help others understand that an individual is entitled to certain resources.

Social network theory has existed as a separate field of research for many decades (Travers and Milgram, 1969; Granovetter, 1973; Burt, 1997). It focuses on the role that network structure plays in generating benefits from social relationships. In social network theory, there is a distinction between nodes (actors) and ties, i.e., relationships between the actors (Burt, 1997).

However, in spite of the network aspect of social capital theory, studies that focus on social capital and virtual, especially 3D virtual communities are rare. Oh et al. (2004) look at social capital and socializing ties in communities and particular parts of society. They use social capital in groups to analyze how social relations of members of a group, both inside and outside of the group are linked to group effectiveness. Bieber et al. (2002), defining a virtual community as a group formed around a particular interest and requiring electronic support, focus on educational communities and professional societies. They develop a plan for a community knowledge evolution system aiming at a type of digital library with particular functions and tools for contributing knowledge and discussion of the contributions. They investigate the knowledge contribution in electronic communities without directly mentioning social capital.

McLure, Wasko and Faraj (2005) put the knowledge sharing in electronic networks of practice as core of their studies. They analyze reasons, ways to foster, and the results of knowledge contributions. Their study focuses on how individual motivations

of people as well as social capital foster knowledge sharing. They adapt the approach by Nahapiet and Ghoshal (1998), which is different from the one applied in this work. McLure Wasko and Faraj (2005) suggest that reputation is a strong motivator for participation and see social capital as a source, rather than a result.

Investigating specific aspects that influence knowledge contribution in virtual communities, Ma and Agarwal (2007) investigate technology infrastructure, Bock et al. (2005) look into extrinsic rewards, reciprocal relationships, and sociological factors, and Dholakia et al. (2004) study group norms and social identity. However, none of these studies use directly the term social capital. Finally, Huysman and Wulf (2006) offer a framework similar to the one in this study without empirical analysis.

3 RESEARCH FRAMEWORK AND HYPOTHESES

In our study, we use social capital mainly as a synonym for information provision and proposed that if information was accessible and passed on from one person to another, social capital was created. This is different from Miller et al. (2009) posit a socializing, rather than a solely informational role for interpersonal online exchanges. Similarly, Wellmann and Gulia (1999) focus on social capital providing support in case of social and mental problems; Lin (2001) stresses social capital mainly influencing agents.

We consider social relations, equal to an exchange of favors and gifts, as the relevant basis of social capital. Building on the model of social capital proposed by Adler and Kwon (2002), we employ their three constituting factors opportunity, motivation, and ability and then add the factor integration.

Opportunity is equal to the ties in a network or the network structure (Adler and Kwon, 2002). Assuming that a certain type of social tie is usually helpful in connection with a specific task, we examine three dimensions of opportunity: opportunity through infrastructure, network closure/strong ties, and weak ties/non-redundancy. The usefulness of a tie depends on the specific context (Adler and Kwon, 2002), which cannot be generally described when studying 3D virtual communities. Therefore we only analyze if any kind of network structure exists, i.e., if any kind of tie

exists, which members of the communities use for the creation of social capital. We assume that network structure is important if the individual has either strong or weak ties connecting him or her to others. If both types of ties exist, we conclude that this is a more valuable situation than having only one type of tie available. The reason for this is that the kind of information an individual looks for can vary while he or she is a member of the community. Regarding opportunity, we propose:

H1a: In CW, opportunity acts as a source of social capital.

H1b: In SL, opportunity acts as a source of social capital.

Motivation encompasses the background to actions of donors and why they help others without being certain of a form of repayment for their favors (Adler and Kwon, 2002). The existence of a relationship between two people alone is no guarantee for social capital to emerge; therefore individual motivations are to be considered. Trust, norms (reciprocity), associability, instrumental motivation, and perceived identity verification contribute to motivation. Trust is a key source of motivation (Putnam, 2000). The same goes for norms, in particular those of generalized reciprocity (Putnam, 2000; Blau, 1986). Associability refers to the "willingness and ability of participants in an organization to subordinate individual goals and actions" (Leana and van Buren, 1999, p. 541) allowing individual actors help others in order to achieve a common goal. Instrumental motivation means that actors are motivated by the expectation of getting another use out of social capital, for example information on career advancement (Adler and Kwon, 2002; Lin, 1981a). Further, based on the literature, we consider *perceived identity verification*, which fosters knowledge contribution. The idea is that precise communication and verification of identity, e.g., through tools in online communities can yield benefits for the participants (Ma and Agarwal, 2007). Regarding motivation, we propose:

H2a: In CW, motivation acts as a source of social capital.

H2b: In SL, motivation acts as a source of social capital.

Ability driving the development of social capital refers to the resources and competencies of individual actors. Following Adler and Kwon (2002), no social capital can develop when the people in the network do not possess any knowledge

or expertise which they can then share with others. This is different from Burt (1997) who says that ability touches only the dimension of human capital, but not social capital. We distinguish five categories of ability: personal resources, resources of contacts (social resources), cognitive ability, Internet experience, and associability. One can use personal resources, resources of contacts, and the others' resources that are accessible through social ties (Lin, 1999). Cognitive ability refers to the ability to share context (Nahapiet and Ghoshal, 1998). i.e.; a person is able to make others understand what she tries to tell him. Internet experience takes into account the Internet context, as Internet experience has an effect on the perception of the usefulness of a website (Nysveen and Pedersen, 2004). Associability affects both the motivation and the ability dimension of social capital (Leana and van Buren, 1999). Regarding ability, we propose:

H3a: In CW, 'ability' acts as a source of social capital.

H3b: In SL, 'ability' acts as a source of social capital.

Integration has been added as potential constituting factor. Alesina and La Ferrara (2000) found a connection between a fragmentation of any kind and a negative impact on social participation and so consequently on social capital. As the Internet makes it easy to find people with the same opinions, interests and ideologies, there is a risk that 'fringe communities' develop, which are distant geographically (van Alstyne and Brynjolfsson, 2005). Such heterogeneity in an online environment can destroy social capital or circumvent its creation (van Alstyne and Brynjolfsson, 2005). We assume that there is a positive connection between a level of high integration and social capital in the 3D virtual community. Regarding the factor integration, we propose:

H4a: In CW, 'integration' acts as a source of social capital.

H4b: In SL, 'integration' acts as a source of social capital.

Table 1 summarizes our hypotheses.

Table 1: Research Hypotheses.

H	Hypothesis
H1a	In CW, the factor 'opportunity' acts as a source of social capital.
H1b	In SL, the factor 'opportunity' acts as a source of social capital.
H2a	In CW, the factor 'motivation' acts as a source of social capital.
H2b	In SL, the factor 'motivation' acts as a source of social capital.
H3a	In CW, the factor 'ability' acts as a source of social capital.
H3b	In SL, the factor 'ability' acts as a source of social capital.
H4a	In CW, the factor 'integration' acts as a source of social capital.
H4b	In SL, the factor 'integration' acts as a source of social capital.

Compared to Adler and Kwon (2002), we exclude possible risks and benefits of social capital. We assume that social capital yields benefits only although for instance Portes (1998) warns about the risks of social capital, such as free-riding on information. We measure the benefits of social capital because social capital itself is difficult to operationalize. Nevertheless, we focus on the existence and the 'quantity' of social capital. Determining its value would be beyond the scope of this study. Therefore, we do not consider contingencies and capabilities affecting social capital value either.

4 RESEARCH APPROACH

We use an online survey to collect the data from an online environment. We employ a seven-item Likert scale, ranging from the highest ('applies fully') to the lowest ('does not apply at all'). In the analysis, the highest rated answer was represented by the value '6' and the lowest by the value '0'. At the end of the questionnaire, we asked about the participant's, gender, age, and education.

We pre-tested the questionnaire by six executives of two 3D virtual communities. Based on their comments, we provided more detail on the purpose of the research in the introduction and modified some of the warm-up questions since they were perceived as too polarizing. After the refinements, the survey link was distributed through various channels related to the two platforms (details upon request).

After six weeks of online presence between December 2008 and January 2009, 223

questionnaires were completed. Of those, we eliminated four questionnaires because of answers the respondents filled in the same answer for every single question. Further, in preparation for the analysis, we aggregated the individual factor items by calculating their mean, so that we obtained one value for each factor.

Of the 219 remaining questionnaires, 63% were filled in by SL users and 37 % by CW users (of those: 44% CW U.S., 54% CW Korea, 1% CW China, and 1% CW Japan). Overall, 61% of respondents were female and 39% male. Their age ranged from 18 to over 45 years in SL and from under 18 to 36-45 years in CW. The largest respondent group in SL was over 45 (42%) and in CW 18-25 years (51%). In CW, 52% had a college degree or higher level of education, in SL even 88% (74% overall).

5 RESULTS

5.1 Descriptive Statistics and Regression Analysis

First, we tested the *sample size*, i.e. whether the sample contains enough subjects to actually conduct a multiple regression analysis. We used the formula proposed by Green (1991) for models with less than 7 independent variables. We apply the formula $N \geq 50 + 8m$. For CW, the required minimum number of subjects is $50 + 8 \cdot 2 = 66$ compared to 79 subjects in the sample. For SL, the 140 subjects meet the required $50 + 8 \cdot 4 = 82$ ones.

The *standard deviation* is low for the overall sample, CW, and SL. The higher standard deviation value for social capital (0.937, 1.433, and 951 for the three samples) could mean that the level of social capital that is created for the individual differs from respondent to respondent.

Tests on *Cronbach's alpha* suggest sufficient reliability of all constructs. Almost all values for Cronbach's alpha exceed a level of 0.70. Only for SL, the value for the integration is 0.692; which is still acceptable (Ma and Agarwal, 2007).

We then estimated the *regression functions* for CW and SL. Of the models with significant *t-values*, we chose the one with the best overall predictive fit. The regression functions are:

$$\text{Social Capital (CW)} = -1.143 + 0.759 \text{ Motivation} + 0.431 \text{ Ability}$$

$$\text{Social Capital (SL)} = -0.889 + 0.213 \text{ Motivation} + 0.511 \text{ Ability} + 0.282 \text{ Opportunity} + 0.190 \text{ Integration}$$

Concerning the *goodness of fit* (see Table 2), the R^2_{adj} for CW is 0.502 and the value for SL is 0.503. This means that 50.2% (50.3%) of the variation in social capital is explained by the independent variables in the particular model. We then checked the *validity of the regression functions*, i.e., whether the proposed models are valid for the population, by looking at the *F-values* (see Table 2). They are 40.357 for the CW sample and 36.184 for SL. At the required level of significance of 0.05 and 2 degrees of freedom (CW) as well as for 4 degrees of freedom (SL) the value is much higher than the theoretical values of approximately 3.12 for the CW sample and 2.2 for the SL sample. The level of significance for both samples is zero; the two models are valid for the population.

Next, we analyzed the *validity of the regression coefficients* (see Table 3). For SL, the *t-values* are larger than 2 and the significance levels of the regression parameters are well below the threshold of 0.05. The lowest significance level is 0.011 (motivation). For CW, the levels for the two independent variables are 0.000 and 0.032, i.e., all independent variables in the two models are significant at a level of 95%. Overall, the significance levels for SL are better than those for CW.

Testing for *multi-collinearity*, we investigate the variance inflation factor (VIF) and the corresponding value for tolerance for each independent variable and each community (see Table 3). For CW the highest VIF value is 1.699,

and for SL the highest value is 2.111. All values are below the threshold value of 10 (Chatterjee et al., 2006). The tolerance values, which should be relatively high to indicate an absence of multi-collinearity, are all above 0.10. There is no indication of multi-collinearity; none of the variables is redundant.

We examined the normality of the error terms by creating graphs (left out due to page limit). Neither the graph of normal distribution nor the normal probability plot shows evidence against normality for the respective model; especially in the normal probability plot residuals are all very close to the line through origin.

5.2 Assessment of Hypotheses

According to the regression analysis, there is no significant relation between opportunity and integration and the formation or existence of social capital in CW. Therefore, H1a and H4a cannot be assessed. However, there is a significant relationship between motivation and ability and social capital; H2a and H3a could be supported. Motivation is highly significant.

For SL, all four factors show a significant positive relationship with social capital. Therefore, H1b, H2b, H3b, and H4b are supported.

Figure 1 summarizes the factors which appear to be significant as source for social capital in each 3D virtual community. Table 4 summarizes the assessments of the hypotheses.

Table 2: Regression Model Fit.

Sample	Measure	Sum of Squares	Df	Mean Square	F	Sign.	R	R ²	Adj. R ²	Std. Error
CW	Regression	82.552	2	41.276	40.357	0.000	0.718	0.515	0.502	1.011
	Residual	77.730	76	1.023						
	Total	160.282	78							
SL	Regression	65.088	4	16.272	36.184	0.000	0.719	0.517	0.503	0.671
	Residual	60.709	135	0.450						
	Total	125.797	139							

Table 3: Regression Coefficients.

Sample	Variable	Tolerance	VIF	Beta	Adj. Beta	Std. Error	T	Significance
CW	(Constant)			-1.143		0.681	-1.679	0.097
	Motivation	0.589	1.699	0.759	0.550	0.144	5.284	0.000
	Ability	0.589	1.699	0.431	0.227	0.198	2.184	0.032
SL	(Constant)			-0.889		0.472	-1.883	0.062
	Opportunity	0.474	2.111	0.282	0.234	0.096	2.932	0.004
	Motivation	0.562	1.780	0.213	0.224	0.083	2.573	0.011
	Ability	0.560	1.786	0.511	0.362	0.113	4.536	0.000
	Integration	0.994	1.006	0.190	0.178	0.064	2.966	0.004

We only measured the alpha-error, not the beta-error. The consequence of a relevant beta-error would be that a connection between factors is overseen. The sufficient, but relatively small sample for CW could be responsible for the non-significance of two out of four independent variables (factors). Further, for simplicity reasons, the individual aspects have not been weighed when creating the independent variables. Therefore, we do not know which of the individual aspects of each factor contribute to the obtained result.

6 DISCUSSION

The results show that in CW, which resembles a networking platform, only two of the four proposed factors constitute social capital.

In CW, *motivation* is determined by trust, norms, associability, instrumental motivation, and perceived identity verification, all of which are present. Trust and norms are presumably likely to play an important role because of the users' age structure. Internet users under 18-year-olds are more trustful online and have fewer concerns about privacy violations than older Internet users (Youn, 2008). They are likely to share more information. Norms might encourage participation. Parents

might support their children's participation more in a monitored environment compared to a more open one. Associability could also drive motivation. Net-wide competitions and campaigns run on CW. For example, the monthly competition 'Cy Uhlzzang' ('the best looking'), where nominees often recruit friends and acquaintances, in an attempt to get votes. CW users also exchange information for instrumental reasons. *Ability* positively influences the development of social capital as well. There could be no social capital without anybody knowing anything that they could share with others. Even though CW is fairly self-explanatory, some Internet experience helps users finding their way on the community website and using the available tools. Cognitive ability is likely present due to the picture-, music- and video-sharing applications on the site. *Integration* is not significant. A reason could be that there are several CWs around the world. One needs a Korean social security number to register as a member on the Korean CW (Kanellos, 2006); most members visiting CW U.S. are U.S. Americans or Canadians. *Opportunity*, surprisingly, is not significant. Possibly the ties used in CW are rather task-specific, whereas the questions asking about opportunity were rather general. In such case, it differs from user to user whether strong or weak

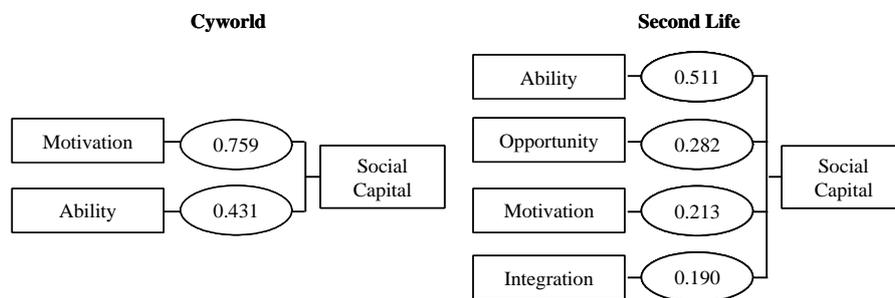


Figure 1: Significant Factors and Respective B-Values [Source: Table 3].

Table 4: Assessment of Hypotheses.

Hypothesis	Result
H1a (Opportunity, CW)	N/A
H1b (Opportunity, SL)	Supported
H2a (Motivation, CW)	Supported
H2b (Motivation, SL)	Supported
H3a (Ability, CW)	Supported
H3b (Ability, SL)	Supported
H4a (Integration, CW)	N/A
H4b (Integration, SL)	Supported

ones are more useful. However, we would have expected that opportunity appeals more on a networking site like CW than on an online gaming-like platform. Maybe, the level of technical expertise and Internet experience required explain it. Lower expertise and experience level may suggest less interest in opportunity.

In SL, which appears more like an online gaming platform, *ability*, *opportunity*, *motivation*, and *integration* play a role in building social capital. *Ability* is the most important determinant of social capital; it is more important than in CW. There are several explanations for this. SL users are on average older and better educated than CW users. So, they are bound to have more resources available in terms of knowledge and experience which can be shared with other users. Furthermore, the more complex concept of SL requires a high level of Internet experience for participating on the platform and for sharing information with other users. *Opportunity*, i.e., the ties between people, plays a weaker role in SL compared to CW. SL users may spend so much time in SL that they feel as if they know the others personally, although SL support remaining anonymous. In fact, in SL both parties could play specific roles much unlike their real personalities. Therefore respondents might perceive the ties with other users as being personal and impersonal at the same time. This could explain the significant result in contrast to CW. *Motivation* is far less important in SL than in CW. Explanations could be less trustful adult users or more anonymous community type. Users only know the other person as an 'avatar'. In contrast to CW, in SL the sources of motivation likely lie in the areas of instrumental motivation and perceived identity verification. Since SL is fairly complicated, users may help each other on problems concerning the use of the platform tools. Perceived identity verification could be more important than in CW. Many SL users make use of the option to disguise themselves, i.e., literally live a 'second life'. Likely, these users are more prepared to interact with others who give them positive feedback on their avatar and the way they intended to present themselves. *Integration* is least important for developing social capital in SL. But in contrast to CW, it plays a role. A reason could be the lower fragmentation. As there is only one SL platform, SL users have different cultural backgrounds. They are likely to be more open about sharing information with people who are different from themselves because they are more used to it.

In summary, the factors driving the development of social capital differ between CW

and SL. While motivation and ability play significant roles on both platforms; opportunity and integration constitute social capital only in SL. The differences may be explained by the specific nature, layout, and construction of the communities as well as the age and educational structure of their members.

In both samples almost 50% of the variation in social capital is not explained by the variables in the model. Other influencing factors must exist.

7 SUMMARY AND OUTLOOK

In this study, we investigate the development of social capital in 3D virtual communities. We find that motivation is particularly important for driving the creation of social capital, followed by the resources at the nodes of the network, i.e., ability. Also the users' education and age structure in particular influence the development of social capital. Further, it seems to make a difference if the platform is designed for users living in the same country or if it invites users from all over the world. Beyond those first insights, our results also suggest that more factors than the ones discovered here contribute to developing social capital in 3D virtual communities. Future research should therefore focus on identifying those factors as well as look at the already found factors more closely.

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