

Anna Felnhofer
Oswald D. Kothgassner
(Eds.)

Challenging Presence

Proceedings of the International Society
for Presence Research

15th International Conference on Presence



facultas.wuv



Anna Felnhöfer, Research Associate at the Department of Applied Psychology and Director of the Virtual Reality Lab at the University of Vienna, Austria; Guest Researcher at the TU Eindhoven, NL.

Oswald D. Kothgassner, Research Associate at the Department of Applied Psychology and Director of the Virtual Reality Lab at the University of Vienna, Austria; Guest Researcher at the TU Eindhoven, NL.

Bibliografische Information Der Deutschen Nationalbibliothek

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.d-nb.de> abrufbar.

Alle Angaben in diesem Fachbuch erfolgen trotz sorgfältiger Bearbeitung ohne Gewähr, eine Haftung der HerausgeberInnen, AutorInnen oder des Verlages ist ausgeschlossen.

Copyright © 2014 Facultas Verlags- und Buchhandels AG
facultas.wuv Universitätsverlag, Stolberggasse 26, 1050 Wien, Österreich
Alle Rechte, insbesondere das Recht der Vervielfältigung und der Verbreitung sowie der Übersetzung, sind vorbehalten.

Umschlagfoto: © Virtual Reality Lab of the University of Vienna

Satz: Anna Felnhöfer, Oswald D. Kothgassner

Einbandgestaltung: Anna Felnhöfer, Oswald D. Kothgassner;

Facultas Verlags- und Buchhandels AG

Druck: Finidr, Tschechien

Printed in Czech Republic

ISBN 978-3-7089-1081-9

Social Presence as influencing Factor for Social Capital

Katja Neureiter¹, Christiane Moser¹ & Manfred Tscheligi¹

Abstract. Video-mediated communication (VMC) technologies aim at supporting social presence by conveying non-verbal cues such as gaze or gestures (as the medium's qualities). This can contribute to a user's experience of being connected and being part of a network of social relationships, which are valuable and potential resources of social capital. This paper aims to contribute to the understanding of the relationship between social presence and social capital from a sociological perspective. Insights from an explorative field study with a VMC technology illustrate, for example, how users felt like being in the same room and how this adds to a mutual understanding, which forms the basis for the development of trustworthy relationships, contributing to one's social capital.

Keywords. Social Presence; Social Capital; Video-Mediated Communication

Introduction

Video-mediated-communication (VMC) technologies have become an integral part of everyday life for many people. Physical distance is no longer a barrier for taking part in social life. Communication over distance at any time and almost any place supports and complements social activities. Most of VMC systems focus on conveying non-verbal cues such as gaze or gestures and aim at supporting social presence, the 'sense of being with another' (Biocca, Harms, & Burgoon, 2003, p. 1). Social presence supports taking part in social life, improves relationships between group members (de Ruyter, Huijnen, Markopoulos & Ijsselstein 2003), and allows experiencing being part of a network of social relationships. According to Pierre Bourdieu (1986), social relationships are valuable, imply actual or potential resources, and create 'social capital'. This paper explores the relationship between social presence theory used in Human-Computer Interaction (HCI) and social capital theory, which originates from Sociology. We explore in what way the concepts support a better understanding of how VMCs might contribute to a user's experience of being connected to others by creating valuable social resources, i.e., trustworthy relationships. We will use insights from the two concepts to analyze results from a field study, where a VMC technology was installed at eight older adults' homes, aiming at supporting their communication with peers of the same village. As a starting point, the theory of social capital, the concept of social presence, and their relationship are described.

Corresponding author

Katja Neureiter
ICT&S Center University of Salzburg
Sigmund-Haffner-Gasse 18
5020 Salzburg
katja.neureiter@sbg.ac.at

Definitions

The Theory of Social Capital

The term social capital originates from Sociology. Although there are multiple definitions, they all share one core aspect (Lin & Erickson, 2008):

Affiliation:

¹ICT&S Center, University of Salzburg

Social capital relates to resources that are embedded in social structures. Initial studies on social capital were done by Pierre Bourdieu (1986), who defines it as 'the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition' (p. 243) or as Coleman (1990) would say: 'inheres in the structure of relations between persons and among persons' (p. 302). Social networks are not something static and unchanging but highly depend on what individuals are willing to invest in relationships. Thus, they are continuously established and reproduced. In contrast to human or financial capital, social capital is not a private property but public (Franzen & Pointner, 2007), as it emerges within social interactions.

Putnam (2000) distinguishes between bridging and bonding forms of social capital. Whereas bridging forms facilitate the access to external resources and identity of big social groups, bonding forms increase cohesion and identity of small groups. Members of such groups share a strong sense of belongingness, which is based on common norms, attitudes, and ultimately the 'unintended consequence of social interaction' (Torche & Valenzuela, 2011, p. 185). Putnam (2000) points out that social capital 'refers to connections among individuals, social networks and the norms of reciprocity and trustworthiness that arise from them' (p. 19). He emphasizes two major dimensions of personal relations most important with respect to bonding forms of capital: trust and reciprocity. Thus, social capital is not simply a matter of the quantity of social contacts, but a question of the quality of social relationships.

Based on these reflections, we consider social capital as a resource embedded in social networks and structures. It is not static but depending on individuals' willingness to invest in social relationships. This can create in turn personal value by contributing, e.g., to one's subjective well-being (Torche & Valenzuela, 2011). In this paper, we describe how a VMC system called YoooM might enhance cohesion and support a sense of belongingness. Thereby, we will especially focus on bonding forms of social capital, characterized by reciprocity and trust.

The Theory of Social Presence

Social presence is still an area of growing interest. Approaches for definitions and attempts to measure it have been discussed throughout the past years, for example, quantitative ones (De Greef & Ijsselsteijn, 2001; Bailenson, Blascovich, Beall, & Loomis, 2001; Tu & McIsaac, 2002; Lombard, Ditton, & Weinstein, 2009) and qualitative ones such as interviews (Retaux 2003) or content analyses (Rourke, Anderson, Garrison & Archer 1999). In this context, the importance of non-verbal cues, such as mutual gaze, have been identified to enhance social presence within mediated social interactions (Dalziel-Job, Oberlander, & Smith, 2011; Neureiter, Murer, Fuchsberger, & Tscheligi, 2013).

The definitions for social capital are manifold, so are the attempts to define social presence. First approaches originate from the work of Short and Christie (1976), who define social presence as the 'degree of salience of the other person in a mediated communication and the consequent salience of their interpersonal interactions' (p. 65). They point out that the medium's qualities (e.g., sound or video) are decisive to experience social presence within a mediated communication with varying degrees. Newer approaches emphasize individuals' perceptions. Biocca et al. (2002), for example, define social presence as a sense of being with another person in a mediated environment or as 'the moment-to-moment awareness of co-presence of a mediated body and the sense of accessibility of the other being's psychological, emotional, and intentional states' (p.10). Thus, social presence is considered as an experience being supported by medium's qualities and can be there or not.

What exactly does a medium need to provide to allow the experience of presence? In literature, we find two components: interactivity and immediacy. Interactivity is considered as engagement and is illustrated by activities users perform and the feedback they receive. It might be compara-

ble to what Biocca and Harms define as mutual understanding or psychological involvement that is influenced by a temporal component: immediacy. Immediacy influences interactivity through straightforward reactions of communication partners. This in turn might have a positive impact on social presence (Tu & McIsaac, 2002). Consequently, we define social presence as a subjective experience of being with another person within a mediated communication, which is influenced by medium's qualities, i.e., the extent to which it allows for immediacy and interactivity.

Sources of Social Capital and the Interrelationship with Social Presence

According to Putnam (2000), the two major sources of social capital are norms of trustworthiness and reciprocity. Trust, attributed to social relationships, can be described as the willingness to rely on the actions of another party. It develops over time, provides stability, and requires building a personal relationship for which communication is a central aspect. Within mediated communication, non-verbal cues, such as postures or gestures, are especially important to gather feedback on the communication partner's reactions. They contribute to mutual understanding (Mukawa, Oka, Arai, & Yuasa, 2005), which is the basis for building a trustworthy relationship. Toma (2010), for instance, investigated to what extent of the nature of online information on dating portals has an influence on how trustworthy online daters are perceived. According to the social presence theory, the results illustrate that the amount of cues (e.g., audio and video) positively correlate with trustworthiness. This means that rich social media, conveying non-verbal cues, support social presence and positively influence socio-emotional change, like trust. Thus, social presence is an important precondition for developing and/or maintaining trustworthy relationships.

Reciprocity can be defined as a social dynamic, whereby persons give, receive, and return (Mauss, 1966). Referring to Luhmann's three-fold distinction of meaning, Torche and Valenzuela (2011) point out three important dimensions of personal relationships: factual, social, and temporal. Co-presence is the factual dimension, referring to the consciousness of another person or the awareness of the communication partner being present (Biocca & Harms, 2002). The social dimension is reciprocity, characterizing the social interaction of giving and receiving. Finally, the temporal component memory is defined as 'acknowledgement and commemoration of sustained reciprocity over time' (Torche & Valenzuela, 2011, p. 188). It is about remembering people, who have received something from the social interaction they were involved in. Social presence supports reciprocity, if the medium allows for immediate interaction by enabling users to directly

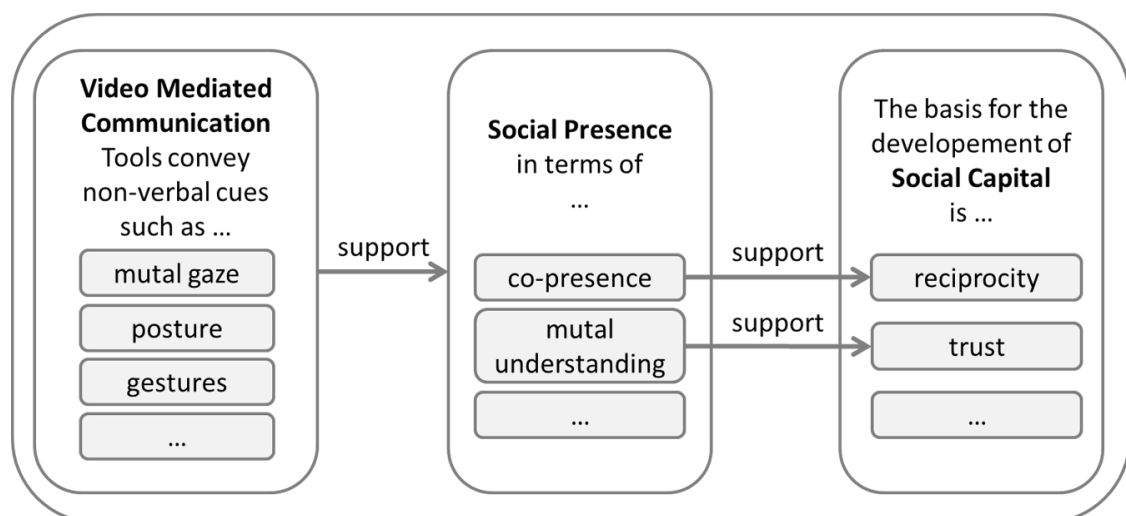


Figure 1. Relationship between Social Presence and Social Capital

respond to their communication partner's actions. Miranda and Saunders (2003) investigated the importance of social presence in the context of information sharing and found out that media that support social presence also facilitate reciprocity, which in turn has a positive impact on the construction of shared meaning. In summary, social capital emerges within social relationships that are characterized by trust and reciprocity and is more or less the product of social interaction (Torche & Valenzuela, 2011). Social presence, in terms of co-presence and mutual understanding, plays an important role to establish trustworthy relationships and to enhance reciprocity within distant communication (see Figure 1).

In the following section, we describe the results of a field study by means of the social capital theory and point out possible interrelationships to the concept of social presence. This section provides insights in what way the study allows drawing conclusions concerning the development of social capital.

An explorative user study in the field

The study we refer to was carried out within the scope of the Connected Vitality¹ project, which aimed at developing a telepresence system for older adults restricted in mobility. supports them to easily get in contact with their family, friends, and care givers, allowing them to experience social presence and making them actually experience being connected to their beloved ones. In the following, we will briefly describe the system, measures & methods that were used for data assessment, the procedure, and the sample.

The Telepresence System

The system consists of two screens and two cameras, displaying the communication partner in a natural and realistic way (see Figure 2a). It provides the user with a variety of non-verbal cues such as gestures and postures, which are important in human communication (Mukai et al., 2009), as they support mutual understanding (Mukawa et al., 2005) and natural communication (Bondareva, Meesters, & Bouwhuis, 2006). These cues might provoke a sense of talking with a person-face-to face (Almeida et al., 2012) and, thus, in turn positively influence social presence (Neureiter et al., 2013). In comparison to conventional VMC systems, it provides a more holistic picture of the communication partner, showing a rather seamless image not only of the communication partner's face but also of the whole upper body when communicating via the Meet Format (see Figure 2a).

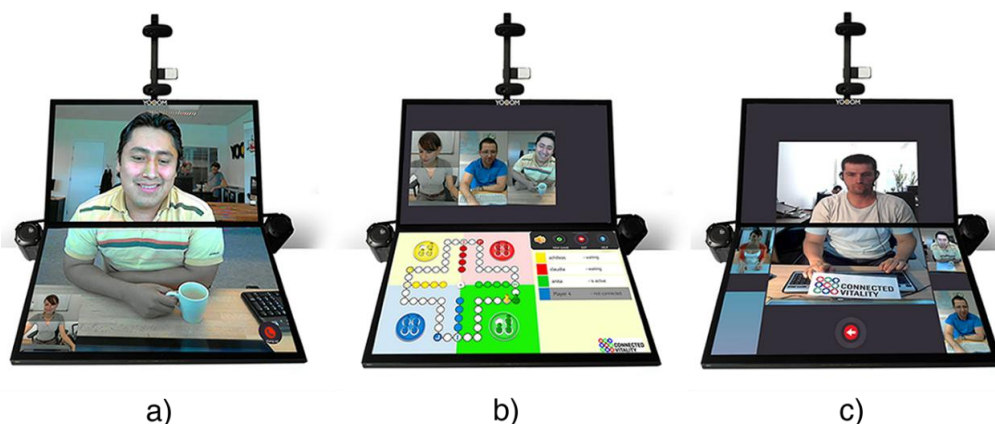


Figure 2: Communication Formats

¹ <http://www.connectedvitality.eu>

Apart from the Meet Format (see Figure 2a), participants could communicate via the Club (see Figure 2b) and the Classroom Format (see Figure 2c). Both allow engaging with four other users at most. Within the Club Format, it is possible to play games together with others or to surf the Internet. The Classroom Format allows one user to take a 'leading part' as a kind of 'teacher' who is displayed almost life-sized in the middle of the screen. Thus, it allows better illustrating something to other users similar to standing in front of them.

Measures & Methods

For data assessment a multi-method approach was chosen, including qualitative and quantitative methods. At the beginning and the end of the six-week field trial, qualitative interviews were carried out. The beginning interviews aimed at assessing participants' social background; those interviews at the end were to reflect about their experiences during the trial with respect to their subjective experience of loneliness and connectedness. The interview questions were developed based on the UCLA loneliness scale (Russell, 1996) and the social provision scale (Cutrona & Russell, 1987), which are valuable tools to assess one's subjective feelings of social isolation and the degree of social support one's relationships provide.

For data assessment during the trial, participants were asked to use a diary, consisting of standardized questionnaires and open questions. For example, the SPGQ (De Greef & Ijsselstein, 2001) was used to assess social presence and participants were asked to fill it out in week one and week six of the trial. Open questions aimed at assessing participants' experiences when using the device. They were asked to write down their thoughts, what they liked, disliked, or appreciated most when, for example, playing a game with other users.

Procedure

Eight participants were recruited by the project partners for the present study to try out the so-called YoooM system over a period of six weeks. Before the official start of the study, they were invited to a workshop, where they were informed about the project, the overall procedure, and the functioning of the device. Afterwards, appointments for the installation were made, which happened for all participants in the same week. When the system was installed at participants' homes, the test leader on-site carried out the beginning interview that aimed at gathering information about their social background (e.g., with whom they are in regular contact). Moreover, the materials needed during the study, i.e., a diary for data assessment (for a detailed description see section measures and methods) and calendar were handed out.

The calendar was used as a form of reminder to fill out the questionnaires in the diary and encouraged participants to get in contact with others, for example, via the Club Format to play some games. Additionally, the test leader called the participants 2-3 times a week via the Meet Format, to ask if the YoooM works properly and arranged one Classroom activity per week.

At the end of the trial, when the system was uninstalled, the test leader carried out a final interview to talk with the participants about their experiences during the study, to gain background information with respect to social presence, their experience of connectedness and to discuss the diary.

Sample

Overall, eight older adults took part in the study, aged between 63 and 81 years ($M = 70$, $SD = 6.97$). Participants were retired, had at least basic computer skills, and were in general interested in new communication technologies. All participants indicated being well inte-

grated in a social network of family and friends, with whom they stay in contact via Email and the telephone, if they could not meet them face-to-face. Participants did not know each other before, and made first contact via the VMC system.

Results & Discussion

In the following, we will point out central results of our field study with respect to social presence, especially, co-presence and mutual understanding. Moreover, we will outline to what extent the results allow drawing conclusions on the potential of the system to facilitate reciprocity and the development of trust, which are important aspects for the development of social capital.

Social presence was assessed at the beginning and at the end of the field trial using the ten-item scale of the SPGQ (De Greef & Ijsselsteijn, 2001) (statements were rated on a five-point-scale; 1=totally disagree, 5= totally agree). The means ranged between 3.89 (SD = 0.52) after week one and 4.00 (SD = 0.48) after week six, indicating that all participants reported a stable feeling of social presence.

Within the interviews, half of the participants indicated that they felt like being in the same room, pointing out that they especially enjoyed the big screen, allowing them to recognize facial expressions, hand gestures, and body movements. They indicated that the conversation appeared to them being similar to talking with a person face-to-face and that it made it easy for them to assess what the communication partner has said. This in turn evoked an experience of closeness and familiarity. One person, for example, stated, "It seemed like we knew each other better than we did." Moreover, all participants indicated that the system allowed them to make new acquaintances; all except of one stated they felt integrated in a group. Another participant said, "I did not know any persons in the group, but I feel that the device allows me to become friends with several of the group."

The results indicate that the additional non-verbal cues supported users' experiences that the person they were talking to was actually 'co-present'. This experience of co-presence not only enabled participants to gather feedback on their communication partner's reactions, but also supported mutual understanding, which was reflected in participants' experience of closeness and familiarity. Considering mutual understanding as the basis for trustworthy relationships, we consequently argue that the system has the potential to support the development of social capital. Moreover, participants appreciated that they could see more than just the communication partner, but also decorative items or artworks of the home. This in turns supported their feeling that the interlocutor was present. Therefore, the environmental context contributed to participants' experience of co-presence. One participant stated, "You really had to tidy up a bit before you called somebody." This quote illustrates that it was important for the person that the room was tidied up before s/he called somebody. This would probably not have been the case when s/he experienced the communication more 'virtual'. As described before, according to Torche & Valenzuela (2011), co-presence is the factual dimension of reciprocity, meaning that it is the product of social interaction. Our findings indicate that participants experienced co-presence, which contributes to the development of social capital.

Finally, the possibility to engage in common activities within the Classroom Format (e.g., reading a book together or discussing about current socio-political issues) contributed to participants' experience of being integrated in a group of people. The following statement of one participant reflects this finding: "The activities in the Classroom were the best because we created a feeling of being a part of a group [...] We created a good community!" Only one participant of this field trial was not sure if s/he really felt integrated. The system allowed to engage in common activities and, thus, provided the opportunity to respond immediately, which has been already identified as important precondition for social presence (Tu & McIsaac, 2002). We would like to point out that

the opportunity of engaging in common activities supported reciprocity among the participants, which facilitates the development of social capital.

In summary, we found that participants experienced social presence, i.e., mutual understanding and co-presence, which was supported by the additional non-verbal cues the system provided. This, in turn, fostered reciprocity and the development of trust, which are both important pre-conditions for the development of social capital. With this study, we consequently could show that social presence is related to participants' social capital. VMC systems, which facilitate a feeling of social presence, may be promising for increasing peoples' well being, which might arise through social capital.

Conclusion

Originally, the field study we refer to in this paper was not intended for investigating how the presented VMC system contributed to participants' social capital, but how their experience of social presence would change over time and if the system allows a feeling of connectedness. Nevertheless, we think that interpreting the results using social capital theory and the social presence theory allow drawing conclusions regarding the value of the system for the development of social capital. The main contribution of this paper is not to draw general conclusions, but to consider social presence as an important contributing factor to encourage trust and reciprocity and, thus, the development of valuable relationships, i.e., social capital. We identified the variety of non-verbal cues the system provides as important enabler for co-presence and mutual understanding. Moreover, the given opportunity to engage in common activities encouraged reciprocity, which in turn supported participants' experience of being part of a community. Social presence should be considered as one, among others, contributing factors for the development of trustworthy relationships. We will further investigate how VMC technologies can serve as medium for the development of social capital and the influence of other contributing factors.

Acknowledgements

This research was enabled by the ConnectedVitality project and was supported by PresenceDisplays who provided the system. The financial support by the AAL JP and the support of all involved parties in the project are gratefully acknowledged.

References

- Almeida, I. d. S., Oikawa, M. A., Carres, J. P., Miyazaki, J., Kato, H., & Billinghurst, M. (2012). AR-based Video-Mediated Communication: A Social Presence Enhancing Experience. In SVR'12, 14th Symposium on IEEE, 125–130.
- Bailenson, J. N., Blascovich, J., Beall, A. C., & Loomis, J. M. (2001). Equilibrium Theory Revisited: Mutual Gaze and Personal Space in Virtual Environments. *Presence: Teleoperators & Virtual Environments*, 10(6), 583–598.
- Biocca, F., & Harms, C. (2002). Defining and Measuring Social Presence: Contribution to the Networked Minds Theory and Measure. In *Proc. of PRESENCE*, 2002, 1–36.
- Biocca, F., Harms, C., & Burgoon, J. K. (2003). Toward a More Robust Theory and Measure of Social Presence: Review and Suggested Criteria. *Presence: Teleoperators & Virtual Environments*, 12(5), 456–480.
- Bondareva, Y., Meesters, L., & Bouwhuis, D. (2006). Eye Contact as a Determinant of Social Presence in Video Communication. *Human Factors in Telecommunication*.
- Bourdieu, P. (1986). *The Forms of Capital. Handbook of Theory and Research for the Sociology and Education*, red. JG Richardson. Greenwood, New York.
- Coleman, J. S. (1990). *Foundations of Social Theory*. Harvard University Press.
- Cutrona, C. E., & Russell, D. W. (1987). The Provisions of Social Relationships and Adaptation to Stress. *Advances in personal relationships*, 1(1), 37–67.
- Dalzel-Job, S., Oberlander, J., & Smith, T. J. (2011). Contested Staring: Issues and the use of mutual gaze as an on-line measure of social presence. In *Proc. ISPR'11*. De Greef, P., & Ijsselstein, W. A. (2001). Social Presence in a Home Tele-Application. *CyberPsychology & Behavior*, 4(2), 307–315.

- de Ruyter, B., Huijnen, C., Markopoulos, P., Ijsselstein, W., (2003). Creating social presence through peripheral awareness. HCI International 2003. Crete June 22-27. Greece.
- Franzen, A., & Pointner, S. (2007). Sozialkapital: Konzeptualisierungen und Messungen. *Kölner Zeitschrift für Soziologie und Sozialpsychologie, Sonderheft, H.47*, 66–90.
- Lin, N., & Erickson, B. H. (2008). *Social Capital: An International Research Program*. Oxford University Press.
- Lombard, M., Ditton, T., & Weinstein, L. (2009). Measuring Presence: The Temple Presence Inventory. In Proc. of the 12th annual international workshop on presence.
- Mauss, M. (1966). *The Gift: Forms and Functions of Exchange in Archaic Societies*. Cunnison London: Cohen & West.
- Miranda, S. M., & Saunders, C. S. (2003). The Social Construction of Meaning: An Alternative Perspective on Information Sharing. *ISR*, 14(1), 87–106.
- Mukai, S., Murayama, D., Kimura, K., Hosaka, T., Hamamoto, T., Shibuhisa, N., Tanaka, S., Sato, S., Saito, S. (2009). Arbitrary view generation for eye-contact communication using projective transformations. In Proc. 8th VRCAI (pp. 305–306). ACM.
- Mukawa, N., Oka, T., Arai, K., & Yuasa, M. (2005). What is Connected by Mutual Gaze? User's Behavior in Video-Mediated Communication. In Proc. CHI EA '05 1677–1680.
- Neureiter, K., Murer, M., Fuchsberger, V., & Tscheligi, M. (2013). Hand and Eyes: How Eye Contact is Linked to Gestures in Video Conferencing. In Proc. CHI EA'13. 127–132.
- Putnam, R. D. (2000). *Bowling Alone: The Collapse and Revival of American Democracy*. Simon and Schuster New York.
- Retaux, X. (2003). Presence in the environment: theories, methodologies and applications to video games. *PsychNology Journal*, 1(3), 284–310.
- Rourke, L., Anderson, T. Garrison, D. R., & Archer, W. (1999). Assessing social presence in asynchronous, text-based computer conferencing. *Journal of Distance Education*, 14(3), 51–70.
- Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, Validity, and Factor Structure. *Journal of personality assessment*, 66(1), 20–40.
- Short, J. W., & Christie, B. (1976). *The Social Psychology of Telecommunications*. JWA.
- Toma, C. L. (2010). Perceptions of Trustworthiness Online: The Role of Visual and Textual Information. In Proc. CSCW'10. 13–22.
- Torche, F., & Valenzuela, E. (2011). Trust and reciprocity: A theoretical distinction of the sources of social capital. *European Journal of Social Theory*, 14(2), 181–198.
- Tu, C.-H., & McIsaac, M. (2002). The Relationship of Social Presence and Interaction in Online Classes. *The American journal of distance education*, 16(3), 131–150.