

Videoconference in Psychotherapy: Understanding research and practical implications

Research in Progress

Francesco Cataldo

Department of Computing and Information Systems
University of Melbourne
Melbourne, Australia
Email: fcataldo@student.unimelb.edu.au

Antonette Mendoza

Department of Computing and Information Systems
University of Melbourne
Melbourne, Australia
Email: mendozaa@unimelb.edu.au

Shanton Chang

Department of Computing and Information Systems
University of Melbourne
Melbourne, Australia
Email: shanton.chang@unimelb.edu.au

George Buchanan

Department of Computing and Information Systems
University of Melbourne
Melbourne, Australia
Email: george.buchanan@unimelb.edu.au

Abstract

Psychologists started using information technologies, including Videoconference as new space for psychotherapy sessions. The technology role in building the relationship among psychologists and patients is still underexplored. Regardless of technology improvements, the Videoconference communication among therapists and patients can be affected by the features of audio and video quality, the lack of real and mutual gazes and the partial perception of body language. Applying a qualitative methodology based on semi-structured interviews, this study will focus on the role of technology in modulating messages, thoughts and emotions in the communication of a Videoconference therapy. The goal is to provide some understanding of how technology can contribute to the effectiveness of the therapy and enhance the understanding of the human communication by video. The implications of this study will be particularly relevant to detect the factors to be considered and improved in Videoconference Psychotherapy.

Keywords Telehealth, Videoconferencing Psychotherapy, Teleconferencing Psychotherapy, Human Computer Interaction, Telepresence.

1 INTRODUCTION

In traditional psychotherapy, regardless of any specific approach, psychologists and patients interact face to face (f2f), sharing a consultation room (Day and Schneider 2002). According to Verni (2019), the setting, i.e. the space-time frame in which the actors (psychologists and patients) of psychotherapy interact, has external and internal aspects. The external aspects refer to the patients' perception of the psychotherapy context, representing a time-out in their routine. This means that patients take some time off, a pause dedicated to their personal needs, in the safe physical space of a psychologist's studio for their therapy. Being in a safe space, patients overcome personal boundaries and develop trust towards the psychologist and the therapy. The internal aspects instead, refer to the psychologists and their mental state, which needs to be open to any kind of patients expression while staying neutral in their judgement. Both aspects play a key role in building the relationship between psychologists and patients.

Recently, healthcare professionals have started using information technologies (e.g. computers) to enhance the offer of mental health support: these technologies include Video Conference (VC), a new space for psychotherapy sessions (Backhaus et al. 2012). Participants to VC are located in distant sites and interaction is mediated by video, resulting in Computer-Mediated Communication (CMC). A recent Australian Report (Senate Community Affairs, 2018) underlines the disadvantages of rural areas with low access to healthcare, defining the limited access to mental health services as a crisis. As psychotherapy services are strictly reduced in rural areas, VC seems an alternative tool to provide this type of support (Backhaus et al. 2012). Psychotherapy research has provided positive results on the efficacy of VC therapy (VCT) as an alternative to the traditional f2f one (Backhaus et al. 2012). However, the understanding of how technology plays a role in building the relationship between psychologists and patients is still limited. As the establishment of this relationship determines the ongoing process and the final outcome of the therapy as effective and beneficial for the client, it is important to explore the impact of technology resources, such as the video, in VCT. While there are several technologies including 3D cameras devices that can be used to enhance communication among psychologists and patients, little is known about their adoption and the effectiveness experienced by therapists in using such devices.

In relation to whether psychotherapy sessions could be f2f or CMC, scholars have developed two different positions. According to the first position, some unconscious aspects and features of f2f communications cannot be substituted by any mediating systems; thus, physical proximity is essential (Olson et al. 2002). Moreover, it has been frequently heard that the richness of face to face interaction cannot be attained through online approaches (Poblet and Casanovas 2007). Some functions of communication are related to certain communicative cues, whose absence can be an obstacle (Russell 2018). Nevertheless, the second position argues that the "*functions can potentially be choreographed...and potentially analogued*": the computer could provide signals to replace the communicative clues typical of the f2f (Walther et al. 2005, p. 635). In a CMC such as VC, the possibility of replicating f2f communicative clues through the machine is particularly relevant, as the traditional physical proximity is substituted by new ways of attending and being present in the communication, enabled by the technology. Scholars arguing in favour of VC as a valid communication alternative, claimed that VC allows not only *telepresence*, but also enables a better experience of *presence* enhancing the *co-presence* (Mlynář et al. 2018). Following more recent literature on CMC, we define *presence* as a mental state where people do not perceive technology as playing a role in the CMC (Riva 2009). *Telepresence* is described as a communication among people based remotely who interact by audio and video channels, experiencing a solid feeling of attendance (Shahid et al. 2018). *Co-presence* is the feeling of being part of a virtual place shared with people distantly located (Ijsselstein et al. 2001).

However, the technology role in psychotherapy goes beyond just broad discussions around presence. Prior studies have focused on the following factors: i) audio and video quality (Shahid et al. 2018); ii) the establishment of trust between interlocutors (Bos et al. 2002); iii) the exchange of gazes between people looking at each other (Heath and Luff, 1993); iv) the perception of body language's messages completing the verbal information (Nguyen and Canny 2005). These studies focused on CMC in general and not on VCT, but all these elements can affect the VC communication (Barak et al. 2008) and the *therapeutic presence* (TP), defined as an essential factor that generates therapeutic processes such as empathy, trust building, and emotional bonds between therapists and clients (Colosimo and Pos 2015). Yet little is known about the role of the Video in establishing the relationship between psychologists and clients. This relationship is essential to create the Therapeutic Alliance (TA), i.e. the relationship between psychologists and patients considered as a predictive factor for the outcome of the psychotherapy process (Horvath et al. 2011).

The goal of this research is to explore the phenomenon of VC in the specific context of psychotherapy, in order to provide a better understanding of the technology role in the communication between psychologists and patients. Hence, the guiding question to be addressed is: *How might Videoconferencing enhance or disrupt communication among psychologists and clients?* In particular, this research aims to explore how VC impacts on important factors for TP sessions such as presence, trust, sight and body language. The remaining parts of this research in progress paper is structured as follow: we first provide a brief overview of the factors that result relevant in the communication using f2f, CMC, and psychotherapy; we then explore extant literature on the factors that typically guarantee an effective psychotherapy (i.e. presence, trust, sight and body language) leading to the development of some propositions, and how they can impact the process of a VCT.

2 BACKGROUND

People acquire and process messages, experiences, feelings and thoughts through their body and senses (Schultze 2010). Our body is a source of information; we communicate even unintentionally, and it encloses our experiences and knowledge (Lakoff and Johnson, 2008). In VC, the physical experience is interrupted, and the process of information relies on the senses of sight and hearing. Visual cues help gaining proofs of specific actions and establishing a ‘*common ground*’ of mutual understanding of assumptions and statements (Clark 1996). In the case of a VC offering a sight focused on the faces of interlocutors, the communication does not result as effective as a VC offering additional details of the context, for example showing how the participants engage in their surrounding physical spaces (Walther et al. 2005). The gained common ground leverages the communication allowing interlocutors to share information about the environment and material elements that surround participants to the VC (Kraut et al. 2003).

When it comes to psychotherapy through CMC, results are contested. On the one hand, whether patients perceive the TA gained in email and chat therapy better than the one achieved in f2f is still debated (Cook and Doyle 2002). On the other hand, psychologists seem to be more conservative: they rated TA gained via email and chat therapy lower than the one obtained in f2f ones (Rees and Stone 2005). Scholars focusing on more general work alliance among VC participants instead, showed that this alliance can be achieved even with a software (Bickmore et al. 2005). Nevertheless, another study emphasized that, despite “*disclosure, closeness and satisfaction*” have been assessed more positively in f2f rather than CMC therapy, there was no significant evidence of an online lack of “*emotional understanding*” (Mallen et al. 2003). Applying these constructs to VCT, it becomes relevant to explore to what extent the participants (psychologists and patients) experience effective communication achieving high levels of co-presence in the delicate context of a psychotherapy.

In the next section we focus on the following key aspects: presence, trust, gaze and body language, which result partially limited in VCT.

2.1 The absence of presence

Therapeutic Presence is considered essential to develop the treatment process and the interventions. The presence is the base for building empathy and alliance, cognitive restructuring and emotional processing (Colosimo and Pos 2015). According to Bradford (2007), presence is crucial in being objectively in contact with reality. Three areas are crucial for the healing process: 1) embodied experience (feelings, thoughts, and perceptions); 2) external environment (physical space); and 3) interpersonal field (interaction with another human being). The first area is considered the only way to be conscious of a “self” (Damasio 1999; Rochat 2004); the second area points out that the external environment allows creatures to be tied and separated from the setting at the *contact boundary* (Colosimo and Pos 2015) and the value of our experience is linked to how this connection is built. In the Virtual Reality (VR), the presence in the environment is expressed as “feeling really there” (Meehan et al. 2005) and the experience of presence in the Virtual Environment (VE) is enhanced if users are able to impact the environment (for example, to influence the VE moving an arm for collecting something) and the receptiveness and feedback of the VE make the user feel “there” and present in that specific environment (Schuemie et al. 2001). The last area (interpersonal field) is linked to the contacts with other individuals; being present is necessary to build a profound contact with patients (Cooper 2007): being present for a therapist means to be connected with the environment (Perls et al. 1973) and be grounded in the physical space. The therapist is responsive to all the things happening in the therapy room (Colosimo and Pos 2015). The physical environment interferes in the communication generating oddness. In a CMC, interlocutors cannot manage their behaviour as they would, due to the fact that most of their actions are not perceptible by others because of the partial information coming from the other environment. This particular situation is defined as “*fractured ecologies*” (Luff et al. 2003). Due to the

fracture between the environment where the behaviour is generated and the one in which it is perceived, the “*shared interactional zone*” is compromised along with the speech that can be disturbed by external noises (De Fornel and Libbrecht 1996). In that case it would be important to research how this fracture generated by partial information can be dealt with or bypassed. Therefore, the literature generally suggests that it is harder to establish co-presence via videoconferencing. Hence the following proposition should be explored.

Proposition 1a: Videoconferencing Therapy sessions present a challenge to establish co-presence.

Proposition 1b: The establishment of co-presence in Videoconferencing Therapy sessions might be enhanced by generating new interfaces providing a mutual virtual context.

2.2 Fragility of trust

Trust is another aspect that impacts therapy sessions efficiency. According to Fonagy and Allison (2014), trust is crucial for every psychotherapy as it allows clients to feel protected and in safe hands while talking about their private and deep emotions. Trust is defined as “*willingness to be vulnerable, based on positive expectations about the actions of others*” (Mayer et al. 1995) and Handy pointed out that “*trust needs touch*” (1995). Scholars showed that in work environments, the f2f is vital for individuals to communicate and work efficiently, while CMC interferes in the capability to create “*interpersonal bonds*” (Nardi and Whittaker 2002). A study on the development of trust in four typologies of communication (f2f, VC, three-way phone conference, and text chat) showed that in VC trust develops with delay and results fragile when compared to f2f (Bos et al. 2002). Research on how trust is developed in the specific context of VCT is crucial to enhance awareness of the possible aspects that can interfere in building by video the interpersonal bond which result an important trait of the relationship between psychologists and patients.

Proposition 2: Videoconferencing Therapy sessions can help to establish trust, if time is taken and is maintained/closely monitored.

2.3 Partial gaze and body language

Gaze and body language are crucial features in f2f communication because both add extra information to the message orally communicated and help the connection between interlocutors. Studies on these features showed that they seem to be more constrained in VC than in f2f communication (Heath and Luff 1993). For what may concern gaze, it must be underlined that there is no chance, so far, to get a direct and reciprocal eye contact (De Fornel and Libbrecht 1996; Mlynář et al. 2018). The gaze on VC is still a problem, it often generates misunderstanding and it is not possible to establish what a person is looking at (Mlynář et al. 2018). Recently, a study showed how the members of a sign language class interacting by video could see each other but could not understand if the participants were looking at the other participants or the screen (Hjulstad 2016). The author noted that the teacher, based on his perspective, needed to stare at a particular spatial direction to have a gaze of the overall class and, as a consequence, needed to stare at different points of the surrounding environment to refer to individual members. Moreover, this “*referential mapping*” shows that speakers need to refer to “*spatial relations to make sense of gaze and gestures in f2f interaction as well*” (Mlynář et al. 2018). Nguyen and Canny (2005), exploring how the frame impact the VC, found that, while upper-body framing and f2f meetings allow a better level of empathy than head-only frame, there is no support to the hypothesis that f2f generates better empathy than VC with upper-body framing.

In psychotherapy, unconscious messages sent through body language and gaze assume a crucial relevance in the communication between psychologists and clients. In order to guarantee a correct understanding of the messages sent, interlocutors need to verify that the spoken language is consistent with gaze and body language as all of them are complementary features of the communication (Birdwhistell 1968). According to Birdwhistell (1959), each interlocutor is part of the communication process. Hence, we argue that any element of the communication is part of the interaction system. For this reason, the technology mediating the communication needs to be considered as part of the interaction system itself. Thus, the computer-mediating system (CMS) is part of the communication as much as the individuals. In order to explore the guiding research question of this study (see the section 1), we will apply the Chaos theory to the overall VC communication process including both human beings and technology in our analysis.

Proposition 3: Videoconferencing Therapy sessions might help psychologists to understand patients more comprehensively by the capability of the camera to zoom in (focusing on facial expressions) and out (focusing on whole of person).

Proposition 4: Potential Video and Audio delays due to time lag might impact on the efficacy of psychotherapy.

3 CHAOS THEORY AS A FRAMEWORK

Studying video communication, it also becomes crucial to consider how the conditions in which the VC happens interfere with the meaning of peoples' thoughts and feelings that are expressed. According to the Chaos Theory (CT) (Gleick 2011), systems are sensitive to initial conditions: any small alteration in the initial condition can produce considerable changes in the whole system. In VC, any element of the communication between two interlocutors is mediated by the device through which the communication happens; this mediation can alter those elements and put at risk the therapy outcome. If any delay or technical issues interfere during the session, especially in crucial dialogues passages, the session might be affected by these problems. The polysemous, dense and emotional meaning possessed by words in psychotherapy (Carli and Paniccia 2004) should be faced during the session without interruptions, amplifying the empathy and the closeness with patients. Thus, any small alteration during the communication process among psychologists and patients can produce considerable consequences resulting in the lack of an emotional understanding and of a therapeutic intervention. This study aims to shed light on the technology role in modulating messages, thoughts and emotions in the communication of a VCT and to analyse how technology can contribute to the effectiveness of the therapy. We will explore the technology role in the VCT addressing the guiding research question by applying the theoretical lenses of the CT in order to include both human and technological actors in the analysis: the psychologists and the patients, and the CMS enabling the VC. Therefore, the potential and the limitations of the technology should be factored in answering the research question and testing the propositions.

4 RESEARCH METHODOLOGY

The proposed research will apply a qualitative methodology. Interviewed, who will be expert therapists, will be identified in cooperation with the Australian Psychologist Association (APA). Interviews to therapists will focus on researching limitations and benefits of the communication by Video with the purpose of discovering how human beings communicate through video and how the video mediation affects the transmission of messages. The semi-structured interviews will be designed to investigate, along with propositions (1, 2 and 3) the underexplored themes of VCT highlighted in the research questions: communication between psychologists and patients; the detection of feelings and thoughts; the experience of co-presence. Each theme will be analysed according to the constructs presented in Section 2 of this research in progress paper: presence, trust, gaze and body language. The interviews will be recorded and transcribed, then coded to identify limitations and benefits of technology in VCT. We will analyse the data collected through interviews and triangulate the results in order to address the guiding research question and to understand how VC enhance or disrupt communication among psychologists and patients. The semi-structured interviews will help us to address the research question and the propositions previously indicated by providing a better comprehension on how technology impacts the VC enhancing or disrupting the communication among psychologists and patients. Moreover, it will be possible to explore the significance of our propositions.

5 PROSPECTIVE CONTRIBUTION

Based on the importance of mental health and the use of VCT to support people who live in peripheral and rural areas, it is essential to support professionals and patients in pursuing a better quality of mental health services. Hence, new technologies and tools should be developed to address the needs of patients and psychologists to express their thoughts and feelings through any device. It is crucial to verify how the video modulates the communication and emotions. By understanding the needs of professionals and patients, we will explore the phenomenon of VC psychotherapy gaining in-depth understanding of how people behave in VC therapies and identify the factors that can enhance or disrupt communication in VCT. The results and implications of this study will be helpful not only for healthcare professionals and users, but also for the research community dedicated to the in-depth understanding of communication by video. We will contribute to the body of literature dedicated in understanding CMC by providing a better comprehension of how technology can play a role in the VC communication. It will be also useful for the development of enhanced software with features that can secure effectiveness of communication. Our insights could stimulate the development of innovative technologies and tools, and further studies in a wide range of scientific domains.

6 REFERENCES

- Backhaus, A., Agha, Z., Maglione, M.L., Repp, A., Ross, B., Zuest, D., Rice-Thorp, N.M., Lohr, J., and Thorp, S.R. 2012. "Videoconferencing Psychotherapy: A Systematic Review," *Psychological services* (9:2), p. 111.
- Barak, A., Hen, L., Boniel-Nissim, M., and Shapira, N. a. 2008. "A Comprehensive Review and a Meta-Analysis of the Effectiveness of Internet-Based Psychotherapeutic Interventions," *Journal of Technology in Human services* (26:2-4), pp. 109-160.
- Bickmore, T., Gruber, A., and Picard, R. 2005. "Establishing the Computer–Patient Working Alliance in Automated Health Behavior Change Interventions," *Patient education and counseling* (59:1), pp. 21-30.
- Birdwhistell, R.L. 1959. "Contribution of Linguistic-Kinesic Studies to the Understanding of Schizophrenia," *Schizophrenia: An integrated approach*.
- Birdwhistell, R.L. 1968. "Kinesics: Inter-and Intra-Channel Communication Research," *Social Science Information* (7:6), pp. 9-26.
- Bos, N., Olson, J., Gergle, D., Olson, G., and Wright, Z. 2002. "Effects of Four Computer-Mediated Communications Channels on Trust Development," *Proceedings of the SIGCHI conference on human factors in computing systems: ACM*, pp. 135-140.
- Bradford, G.K. 2007. "The Play of Unconditioned Presence in Existential-Integrative Psychotherapy," *Journal of Transpersonal Psychology* (39:1).
- Carli, R., and Paniccia, R.M. 2004. *L'analisi Emozionale Del Testo. Uno Strumento Psicologico Per Leggere Testi E Discorsi*. FrancoAngeli.
- Clark, H.H. 1996. *Using Language*. Cambridge University Press.
- Colosimo, K.A., and Pos, A.E. 2015. "A Rational Model of Expressed Therapeutic Presence," *Journal of psychotherapy integration* (25:2), p. 100.
- Cook, J.E., and Doyle, C. 2002. "Working Alliance in Online Therapy as Compared to Face-to-Face Therapy: Preliminary Results," *Cyber Psychology & Behavior* (5:2), pp. 95-105.
- Cooper, M. 2007. "Humanizing Psychotherapy," *Journal of Contemporary Psychotherapy* (37:1), pp. 11-16.
- Damasio, A.R. 1999. *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, (1st ed.) Houghton Mifflin Harcourt.
- Day, S.X., and Schneider, P.L. 2002. "Psychotherapy Using Distance Technology: A Comparison of Face-to-Face, Video, and Audio Treatment," *Journal of Counseling Psychology* (49:4), p. 499.
- De Fornel, M., and Libbrecht, L. 1996. "The Interactional Frame of Videophonic Exchange," *Réseaux. Communication-Technologie-Société* (4:1), pp. 47-72.
- Fonagy, P., and Allison, E. 2014. "The Role of Mentalizing and Epistemic Trust in the Therapeutic Relationship," *Psychotherapy: theory, research and practice* (51:3), p. 372.
- Gleick, J. 2011. *Chaos: Making a New Science*. Open Road Media.
- Handy, C. 1995. "Trust and the Virtual Organization," *Long Range Planning* (28:4), pp. 126-126.
- Heath, C., and Luff, P. 1993. "Disembodied Conduct: Interactional Asymmetries in Video-Mediated Communication," *Technology in working order: Studies of work, interaction, and technology*, pp. 35-54.
- Hjulstad, J. 2016. "Practices of Organizing Built Space in Videoconference-Mediated Interactions," *Research on Language and Social Interaction* (49:4), pp. 325-341.
- Horvath, A.O., Del Re, A., Flückiger, C., and Symonds, D. 2011. "Alliance in Individual Psychotherapy," *Psychotherapy: theory, research and practice* (48:1), p. 9.
- Ijsselsteijn, W.A., Freeman, J., and de Ridder, H. 2001. "Editorial: Presence: Where Are We?." United States: Mary Ann Liebert, p. 179.
- Kraut, R.E., Fussell, S.R., and Siegel, J. 2003. "Visual Information as a Conversational Resource in Collaborative Physical Tasks," *Human–Computer Interaction* (18:1-2), pp. 13-49.

- Lakoff, G., and Johnson, M. 2008. *Metaphors We Live By*. University of Chicago press.
- Luff, P., Heath, C., Kuzuoka, H., Hindmarsh, J., Yamazaki, K., and Oyama, S. 2003. "Fractured Ecologies: Creating Environments for Collaboration," *Human-Computer Interaction* (18:1-2), pp. 51-84.
- Mallen, M.J., Day, S.X., and Green, M.A. 2003. "Online Versus Face-to-Face Conversation: An Examination of Relational and Discourse Variables," *Psychotherapy: theory, research and practice* (40:1-2), p. 155.
- Mayer, R.C., Davis, J.H., and Schoorman, F.D. 1995. "An Integrative Model of Organizational Trust," *Academy of management review* (20:3), pp. 709-734.
- Meehan, M., Razzaque, S., Insko, B., Whitton, M., and Brooks, F.P. 2005. "Review of Four Studies on the Use of Physiological Reaction as a Measure of Presence in Stressful Virtual Environments," *Applied psychophysiology and biofeedback* (30:3), pp. 239-258.
- Mlynář, J., González-Martínez, E., and Lalanne, D. 2018. "Situated Organization of Video-Mediated Interaction: A Review of Ethnomethodological and Conversation Analytic Studies," *Interacting with Computers* (30:2), pp. 73-84.
- Nardi, B.A., and Whittaker, S. 2002. "The Place of Face-to-Face Communication in Distributed Work," *Distributed work*, pp. 83-110.
- Nguyen, D., Canny, J. 2005. "Multiview: Spatially Faithful Group Video Conferencing," *Proceedings of the SIGCHI conference on human factors in computing systems*: ACM, pp. 799-808.
- Olson, J.S., Teasley, S., Covi, L., and Olson, G. 2002. "The (Currently) Unique Advantages of Collocated Work," *Distributed work*, pp. 113-135.
- Perls, F.S., Hefferline, R.F., and Goodman, P. 1973. *Gestalt Therapy: Excitement and Growth in the Human Personality*. Penguin.
- Poblet, M., and Casanovas, P. 2007. "Emotions in Odr," *International Review of Law, Computers & Technology* (21:2), pp. 145-156.
- Rees, C.S., and Stone, S. 2005. "Therapeutic Alliance in Face-to-Face Versus Videoconferenced Psychotherapy," *Professional Psychology: Research and Practice* (36:6), pp. 649-653.
- Riva, G. 2009. "Is Presence a Technology Issue? Some Insights from Cognitive Sciences," *Virtual reality* (13:3), pp. 159-169.
- Rochat, P. 2004. *The Infant's World*. Harvard University Press.
- Russell, G.I. 2018. *Screen Relations: The Limits of Computer-Mediated Psychoanalysis and Psychotherapy*. Routledge.
- Schuemie, M.J., Van Der Straaten, P., Krijn, M., and Van Der Mast, C.A. 2001. "Research on Presence in Virtual Reality: A Survey," *CyberPsychology & Behavior* (4:2), pp. 183-201.
- Schultze, U. 2010. "Embodiment and Presence in Virtual Worlds: A Review," *Journal of Information Technology* (25:4), pp. 434-449.
- Senate, C.A.C.S. 2018. "Accessibility and Quality of Mental Health Services in Rural and Remote Australia," *Parliament House, Canberra*, p. 2.
- Shahid, M., Abebe, M.A., and Hardeberg, J.Y. 2018. "Assessing the Quality of Videoconferencing: From Quality of Service to Quality of Communication," *Electronic Imaging* (2018:12), pp. 231-237.
- Verni, E. 2019. "Il Setting in Psicoterapia Psicoanalitica." <http://www.centroclinospp.it/approfondimenti/269-setting-psicoterapia-psicoanalitica.html> Retrieved 21 July, 2019.
- Walther, J.B., Gay, G., and Hancock, J.T. 2005. "How Do Communication and Technology Researchers Study the Internet?," *Journal of communication* (55:3), pp. 632-657.

Copyright: © 2019 Cataldo, Mendoza, Chang & Buchanan. This is an open-access article distributed under the terms of the [Creative Commons Attribution-NonCommercial 3.0 Australia License](https://creativecommons.org/licenses/by-nc/3.0/au/), which permits non-commercial use, distribution, and reproduction in any medium, provided the original author and ACIS are credited.