

# Identifying the (Tele)Presence Literature

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## ABSTRACT

This paper discusses the value of identifying the expanding interdisciplinary scholarly literature on the topic of (tele)presence, proposes a detailed procedure for doing so, and presents a list of 1,831 journal articles, books and other publications that constitute the (tele)presence literature as of May 2007.

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## 1. Introduction

Since Short, Williams and Christie (1976) wrote about social presence in organizational communication and Minsky (1980) wrote about telepresence and the dynamics of teleoperation, a growing number of scholars in communication, computer science, psychology and many other disciplines have studied (tele)presence and (tele)presence phenomena in a variety of contexts ranging from art to engineering. Some (e.g., Barfield & Weghorst, 1993; Biocca, Harms, & Burgoon, 2003; Draper, Kaber, & Usher, 1998; Freeman, 2004; Heeter, 1992; Lee, 2004; Lombard & Ditton, 1997; Mantovani & Riva, 1999; Sheridan, 1992; Waterworth & Waterworth, 2001; Zahorik & Jenison, 1998) have contributed detailed, often quite diverse, concept explications and many others have reported studies of presence phenomena and used conceptualizations of presence without specifically using the term. Because the research and theory related to (tele)presence is highly interdisciplinary, diverse and scattered, there is no well defined and generally agreed upon definition of what

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constitutes the literature on this topic. We argue here that identifying such a literature will have important benefits for the advancement of (tele)presence scholarship, allowing us to build on work not previously identified as relevant to presence. We then describe a procedure we've developed to identify this literature before presenting and briefly discussing the results of its application: a list of 1,834 publications that constitute the current (as of May 2007) (tele)presence literature.

## **2. Benefits of Defining the (Tele)presence Literature**

A comprehensive list of the scholarly works on (tele)presence would have three important benefits.

First, it would provide an overview of the development and current status of the work in this topic area. It would reveal the volume of work in the area produced to date, the origin and growth trajectory of presence scholarship, and the disciplinary, geographic and institutional diversity of the work (and changes in these over time), all in objective and quantitative terms. Regular updates to the list would allow us to chart future changes in the field's maturity. Evidence of this maturity would have important advantages in justifying (tele)presence scholarship to various stakeholders including individuals and institutions charged with making funding decisions regarding telepresence scholarship and technology.

Second, despite many discussions and explications, there is still substantial disagreement about the meanings and scope of the telepresence and presence concepts. Telepresence is generally used to refer to the sense of 'being there' experienced by users of advanced media such as virtual reality, and more generally, the psychological state or subjective perception in which a person fails to accurately and completely acknowledge the role of technology in an experience. Presence is used both as a shortened version of the term telepresence and to refer to the actual or perceived physical presence of objects and entities, in technology-mediated and/or nonmediated contexts. Further, scholars have used several variants of these terms to distinguish different dimensions or types of the concepts, and there is little agreement about how to appropriately define and measure them. A list, and then a detailed review, of all relevant publications and the conceptual and operational definitions within them would provide a needed perspective on these debates and help us identify and set

aside redundancies so we could focus on the important outstanding issues and increase the cohesiveness, and value, of future scholarship in the field.

Third, especially because it's a particularly interdisciplinary and rapidly changing technology-based field, a comprehensive list of (tele)presence publications is likely to contain theories, findings, and descriptions of phenomena, technologies and applications of technologies related to (tele)presence that many presence scholars wouldn't ordinarily encounter. This exposure would likely create new synergies and suggest new research questions that would help us advance our collective work. Conversely, such a list would create a resource researchers and theorists outside of the domain of (tele)presence might conveniently use to consider their work from the perspectives of (tele)presence scholarship.

### **3. Difficulties Involved and Previous Attempts**

Constructing a valid and comprehensive list of (tele)presence literature poses several challenges. Because of the interdisciplinary nature of the topic, relevant works exist in many different, established literatures each with their own indices, databases and search protocols. Even when scholarly databases are selected there is the problem of what search terms to use. The word presence is generic and often appears in scholarly and other publications in contexts completely unrelated to the concept of interest, producing hundreds of thousands of irrelevant 'hits.'

The debates about what constitutes presence (or telepresence) have led to the use of several different variants of the term for the same and similar concepts – telepresence, virtual presence, social presence, sense of presence, subjective presence, etc., as well as terms that don't include the word at all – parasocial, perceived reality, computers are social actors, and others. While the more specific compound terms yield more useful search results, one has to compile a long list of search terms to capture the complete literature, and many of them, such as virtual presence, produce irrelevant publications that must be "manually" sifted.

A few previous attempts to compile formal and informal collections of presence literature are useful and instructive. IJsselsteijn, Lombard and Freeman (2001) have proposed a core bibliography of presence. While this list, which contains 95 publications, is valuable for determining some of the most influential work in the field,

the focus is narrow and the authors therefore didn't confront the same problems that an exhaustive survey of literature presents.

Emerson, Steed, and Billingham (1999) compiled a "Presence Bibliography" as a technical report for the University of Washington Human Interface Technology Laboratory (HitLab). While the list of 255 works is more inclusive than the core literature, it lacks explicit criteria for inclusion, contains items not generally available, and is 6 years old as of this writing.

The presence-research.org web site, the official site of the OmniPres project funded by the European Union's Presence Research Proactive Initiative, contains a bibliographic list of 92 online papers related to presence, but the inclusion criteria are not provided. Many of the works are early versions presented at conferences, and while some of the works are on the web site, others are only linked and may not remain accessible.

Another listing of presence publications was on the web site of the International Society for Presence Research (ISPR), <http://ispr.info>, until 2007. While it was a large (n=463) list and contained abstracts for many entries, it too was compiled without explicit or systematic criteria for inclusion.

What is needed is a replicable, systematic and updateable document that encompasses all (or as much as is possible) of the theory and research that is directly relevant to the study of (tele)presence. The above examples, although inadequate in various ways, are important resources that are capable of providing a base to begin strategizing as to how such a comprehensive list can be created and maintained.

#### **4. Method: A Strategy for Defining the Literature**

We first developed a set of parameters and criteria regarding works that should and should not be included in a (tele)presence literature and procedures for identifying them.

The works should contain academic/scholarly writing that is relevant to and preferably focused on the concepts and/or phenomena of presence or telepresence, as defined broadly by presence scholars. Recognizing the interdisciplinary nature of the topic, works from any field or discipline – not just psychology, communication and/or computer science - should be eligible for inclusion. Articles in the popular press represent a different, though interesting, venue for information related to (tele)presence

and should be excluded. To be useful, works in the literature should be generally available, that is, catalogued and published or archived in some way that is accessible to the academic community. Journal articles, conference proceedings (but not other conference papers), books and doctoral dissertations normally meet this criterion. Technical reports and masters' theses normally do not qualify (the procedures and standards for these also vary particularly widely and in the case of reports may be biased by commercial concerns).

To insure that works across as many fields as possible were systematically considered, we evaluated several database alternatives, conducting a series of searches and evaluating the results (for example, the database Google Scholar (n/d) is very extensive, but test searches contained many duplicate and irrelevant entries and Google, at this writing at least, has not divulged which resources are searched).

We eventually selected four scholarly citation databases: ComAbstracts, Computer Abstracts, PsycINFO, and ISI Web of Science. ComAbstracts (n/d), maintained by the Communication Institute for Online Scholarship (CIOS), is a database of "sources of relevance to researchers, scholars, and students interested in fields related to human communication studies (mass communication, human interaction, rhetoric, health communication, communication and new media, journalism, communication history, etc.)." Computer Abstracts International Database (CAID) (n/d), published by Emerald, "covers the major computer science subjects including: artificial intelligence; communications and networks; computer theory; database and information systems applications; hardware; human-computer interaction; mathematics of computing; programming; and systems organization." PsycINFO (n/d), published by the American Psychological Association (APA), "provides abstracts and citations to the scholarly literature in the behavioral sciences and mental health. The database includes material of relevance to psychologists and professionals in related fields such as psychiatry, management, business, education, social science, neuroscience, law, medicine, and social work." ISI Web of Science (n/d), from Thomson, is a database index of "current and retrospective multidisciplinary information from approximately 8,700 of the most prestigious, high impact research journals in the world." It includes works in the hard sciences (via Science Citation Index and two chemistry databases), social sciences (via Social Sciences Citation Index), and the arts and humanities (via Arts & Humanities Citation Index).

To insure adequate coverage of the scholarly work on (tele)presence, all of the references identified by Ijsselsteijn et al. (2001) as part of the "core bibliography of

presence” were included. Because they are logical and common venues for the publication of work on (tele)presence, all references published in the MIT Press journal *Presence: Teleoperators & Virtual Environments* and its online, peer-reviewed supplement, [presence-connect.com](http://presence-connect.com), and the Mary Ann Liebert, Inc. journal *Cyberpsychology & Behavior* were included if their title and/or abstract included the use of the term presence or a variant of that term (other than in an incidental or irrelevant context).

The next step was to establish a list of appropriate search terms. A diverse set of words and phrases have been associated with the concept of presence; only those that directly refer to the concept itself rather than related concepts and technologies (e.g., flow, suspension of disbelief, immersion, virtual reality) were included.

The selected search terms fall into two categories: (1) terms that include the word presence and (2) specialized terms that do not contain the word presence but refer to a concept that represents (tele)presence or a key dimension of (tele)presence (e.g. parasocial, CASA). The 16 selected search terms are: telepresence, tele-presence, (tele)presence, spatial presence, social presence, parasocial, computers are social actors, copresence, co-presence, subjective presence, virtual presence, sense of presence, perceived realism, perceived reality, perceptual realism, and social realism.

It's important to note that references identified through database searches, especially for certain search terms (e.g., virtual presence), require a check of the context in which the terms are used. Reading the title of the work in question often clarifies the relevance of the work, but it is not uncommon for further contextualization, usually found within the abstract, to be necessary. Search terms that yield a high proportion of irrelevant references, e.g., the single word presence, were deemed impractical and not used (for this reason it may be useful for scholars to avoid using only the term presence as a shortened term for telepresence). Many terms, such as virtual reality, simulation, illusion, engagement, flow, etc., are clearly related to (tele)presence but yield too many references that don't directly discuss or concern presence or telepresence per se, and are therefore not useful in identifying this literature.

## 5. Results

Over 1,800 (n=1,831) published works were identified as constituting the (tele)presence literature as of May 2007. The complete list of references in APA format

is available [here](#) and on the “Bibliography” page of the web site of the International Society for Presence Research (ISPR) at <http://ispr.info>.

The works date back to the 1930s and the majority of them are journal articles (n=1,614). They feature an impressive diversity of topics and come from a wide array of fields. While *Presence: Teleoperators & Virtual Environments* (n=206) and *Cyberpsychology & Behavior* (n=318) are the most represented, works come from journals in art (*Journal of Art & Design Education*), business (*Production Planning & Control*), communication (*Human Communication Research*), computer science (*Journal of Network and Computer Applications*), education (*Journal of Educational Television*), engineering (*IEEE Transactions on Robotics and Automation*), linguistics (*Cognitive Linguistics*), medicine (*International Journal of Adolescent Medicine & Health*, *Journal of General Internal Medicine*), music (*Journal of New Music Research*), philosophy (*Philosophy & Phenomenological Research*), physics (*International Journal of Modern Physics C*), psychology (*Journal of Psychology*), religion (Studies of Formative Spirituality), social work (*Journal of Social Issues*), sociology (*American Journal of Sociology*), and more. Many nations are also represented, including Germany (*Zeitschrift fur Psychotogie*), Italy (*Rassegna Italiana di Sociologia*), Japan (*Japanese Journal of Experimental Social Psychology*), The United Kingdom (*Elsevier Science*), The United States (*Communication Theory*), and Scandinavia (*Acta Psychiatrica Scandinavica*).

Many interesting phenomena are examined in the works which can serve to expand our conceptualizations and understanding of presence and telepresence. Just a few examples are the sense of the presence of a recently deceased spouse (Conant, 1996) and the illusion of the presence of others as a result of sleep paralysis (Cheyne, 2001), brain injury (Persinger, 1994), psychiatric condition (Koehler & Sauer, 1984) and experimental induction using specific (frequency-modulated) complex magnetic fields (Cook & Persinger, 1997; Tiller & Persinger 2002).

Although there is substantial overlap, many works come from only one of the databases or other sources, suggesting the value of scholars using a broad initial search strategy to obtain material when conducting literature reviews.

## 6. Conclusion

Building on the work of others, we've developed and described here a systematic procedure for identifying the scholarly literature on (tele)presence. The resulting set of works demonstrates the impressive volume and diversity of work in this area and suggests new avenues for conceptualization and understanding. Detailed analyses of the works identified, regular updates of the literature, and perhaps even the use of the identified works as a basis for a centralized database for (tele)presence researchers and theorists would further help demonstrate the health of the field, resolve disagreements, focus efforts, and increase understanding of presence and telepresence phenomena.

## 7. References

- Barfield, W., & Weghorst, S. (1993). The sense of presence within virtual environments: A conceptual framework. In G. Salvendy & M. Smith (Eds.), *Human computer interaction: Software and hardware interfaces* (pp. 699-704). Amsterdam: Elsevier.
- Biocca F., Harms C., & Burgoon, J. K. (2003). Toward a more robust theory and measure of social presence: review and suggested criteria. *Presence: Teleoperators and Virtual Environments*, 12(5), 456-480.
- Cheyne, J. A. (2001). The ominous numinous: Sensed presence and 'other' hallucinations. *Journal of Consciousness Studies*, 8(5-7), 133-150.
- CommAbstracts. (n.d.). [Database]. Communication Institute for Online Scholarship (CIOS). Retrieved July 17, 2007, from <http://www.cios.org/www/abstract.htm>
- Computer Abstracts International Database (CAID). (n.d.). [Database]. Emerald. Retrieved July 17, 2007, from [http://lysander.emeraldinsight.com/info/products\\_services/abstracts/CAID/index.jsp](http://lysander.emeraldinsight.com/info/products_services/abstracts/CAID/index.jsp)
- Conant, R. D. (1996). Memories of the death and life of a spouse: The role of images and sense of presence in grief. In D. Klass & P. R. Silverman (Eds.). *Continuing bonds: New understandings of grief. Series in death education, aging, and health care* (pp. 179-196). Philadelphia: Taylor & Francis.

- Cook, C. M., & Persinger, M. A. (1997). Experimental induction of the "sensed presence" in normal subjects and an exceptional subject. *Perceptual & Motor Skills*, 85(2), 683-693.
- Draper, J. V., Kaber, D. B., & Usher, J. M. (1998). Telepresence. *Human Factors*, 40(3), 354-375.
- Emerson, T., Steed, A., & Billingham, M. (1999). *Presence Bibliography*. University of Washington Human Interface Technology Laboratory (HitLab) Technical Publication: R-99-9. Retrieved July 17, 2007, from <http://www.hitl.washington.edu/publications/r-99-9/>
- Freeman, J. (2004). *Implications for the measurement of presence from convergent evidence on the structure of presence*. Paper presented at the may 2004 conference of the International Communication Association, New Orleans, LA.
- Google Scholar. (n/d). [Database]. Google. Retrieved July 17, 2007 from <http://scholar.google.com/>
- Heeter, C. (1992). Being there: The subjective experience of presence. *Presence: Teleoperators and Virtual Environments*, 1(2), 262-271.
- IJsselstein, W. A., Lombard, M., & Freeman, J. (2001). Toward a core bibliography of presence. *Cyberpsychology & Behavior*, 4(2), 317-321.
- ISI Web of Science. (n.d.). [Database]. Thomson. Retrieved July 17, 2007 from <http://scientific.thomson.com/products/wos/>
- Koehler, K., & Sauer, H. (1984). Jaspers' sense of presence in the light of Huber's basic symptoms and DSM-III. *Comprehensive Psychiatry*, 25(2), 183-191.
- Lee, K. M. (2004). Presence, explicated. *Communication Theory*, 14(1), 27-50.
- Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication*, 3(2). Retrieved February 25, 2005 from <http://jcmc.indiana.edu/vol3/issue2/lombard.html>
- Mantovani, G., & Riva, G. (1999). 'Real' presence: How different ontologies generate different criteria for presence, telepresence, and virtual presence. *Presence: Teleoperators and Virtual Environments*, 8(5), 540-550.
- Minsky, M. (1980). Telepresence. *Omni*, June, 45-51.
- Persinger, M. A. (1994). Sense of a presence and suicidal ideation following traumatic brain injury: Indications of right-hemispheric intrusions from neuropsychological profiles. *Psychological Reports*, 75(3, Pt 1), 1059-1070.
- PsycINFO. (n.d.). [Database]. American Psychological Association. Retrieved July 17, 2007 from <http://www.apa.org/psycinfo/products/electronic.html>

- Sheridan, T. B. (1992). Musings on telepresence and virtual presence. *Presence: Teleoperators and Virtual Environments*, 1, 120-126.
- Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. London: Wiley.
- Tiller, S. G., & Persinger, M. A. (2002). Geophysical variables and behavior: XCVII. Increased proportions of the left-sided sense of presence induced experimentally by right hemispheric application of specific (frequency-modulated) complex magnetic fields. *Perceptual & Motor Skills*, 94(1), 26-28.
- Waterworth, E. L., & Waterworth, J. A. (2001). Focus, locus, and sensus: The three dimensions of virtual experience. *Cyberpsychology & Behavior*, 4(2), 203-213.
- Zahorik, P., & Jenison, R. L. (1998). Presence as being-in-the-world. *Presence: Teleoperators and Virtual Environments*, 7(1), 78-89.