

Toward a Core Bibliography of Presence

WIJNAND A. IJSSELSTEIJN, M.Sc.,¹ MATTHEW LOMBARD, Ph.D.,²
and JONATHAN FREEMAN, Ph.D.³

INTRODUCTION

A CORE LITERATURE IS a set of published written works that are considered "essential," "significant," "of lasting importance," or "of permanent value" to an area of study. It is assumed that although each scholar has specific and often unique interests within a topic area and therefore considers many written works concerning those interests to be "fundamental," most members of an area of scholarly study will share a foundational knowledge, and that this knowledge will be represented in certain more commonly respected written works in the area. These works constitute a core literature.

Researchers have attempted to construct lists and compilations of core literatures in fields and subfields including psychology,¹ sports psychology,² psychology of perception,³ psychiatry,⁴ organization development,⁵ famology (the study of families),⁶ family dynamics of addiction,⁷ American literature,^{8,9} law,^{10,11} econometrics,¹² and agricultural sciences.¹³

Many of these efforts have been motivated by a desire to provide a resource for students, teachers, and others. For students, such compilations represent an introduction to the historical development and current focus of their field. Works in a core literature can also help illustrate to students the characteristics of valuable work in their field and insight into the characteristics of valued scholarship in the area. Awareness that they have read or re-

viewed works in a core literature might also reassure them that they are prepared to enter the field as scholars and teachers. Teachers can utilize core literatures as they develop curricula and reading lists (e.g., a personal review of core literature in law by Day¹¹ was prompted by the desire to develop a course on legal "classics"). Gorenflo¹ suggests that core literature reference lists can also help editors of introductory textbooks ensure representativeness, and researchers, publishers, and librarians are likely to benefit in a variety of ways from the identification of core literatures. While pedagogy has motivated many studies of core literatures, others have been designed to identify the direction in which a field is moving,¹¹ review key work during a particularly important era,¹³ identify areas within disciplines,⁵ and assess the disciplinary status of topic areas.⁶

The following bibliography constitutes a draft version of a core literature in the field of presence research and we hope it will serve many of the goals described above. The bibliography is divided into two main categories, books and papers. While this bibliography is selective, given the massive amount of literature available on presence and its related technologies (virtual reality, cinema, telerobotics, etc.), more comprehensive bibliographies are also available and for these we direct the reader to two online resources that have the specific goal of providing information to people working in the area of presence research:

¹Human-Technology Interaction Group, Department of Technology Management, Eindhoven University of Technology, Eindhoven, The Netherlands.

²Department of Broadcasting, Telecommunications and Mass Media, Temple University, Philadelphia, Pennsylvania.

³Department of Psychology, Goldsmiths College, University of London, London, United Kingdom.

Presence-Research.Org (<http://www.presence-research.org>)

Resources for the Study of Presence (<http://nimbus.temple.edu/~mlombard/Presence>)

The current bibliography will be maintained and updated as a "living" document on the Presence-Research.Org site to reflect the latest publications in the area of presence research. We invite the readers of *CyberPsychology & Behavior* to keep us informed of new resources, and to send us relevant citations, so that they can be added to this evolving document. Any feedback or contributions can be sent to the first author via E-mail (w.a.ijsselsteijn@tue.nl). Your help is highly appreciated in improving this bibliography in order to make it as useful and up-to-date as possible.

BOOKS

- Apter, M.J. (1992). *The dangerous edge: The psychology of excitement*. New York: Free Press.
- Barfield, W., & Furness, III, T.A. (eds.) (1995). *Virtual environments and advanced interface design*. Oxford: Oxford University Press.
- Begault, D.R. (1994). *3-D sound for virtual reality and multimedia*. New York: Academic Press.
- Biocca, F., & Levy, M.R. (eds.) (1995). *Communication in the age of virtual reality*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Carr, K., & England, R. (eds.) (1995). *Simulated and virtual realities: Elements of perception*. London, UK: Taylor & Francis.
- Csikszentmihalyi, M. (1991). *Flow: The psychology of optimal experience*. New York: Harper & Row.
- Durlach, B.N.I., & Mavor, A.S. (1995). *Virtual reality: Scientific and technological challenges*. Washington, DC: National Academy Press.
- Ellis, S.R., Kaiser, M.K., & Grunwald, A. (eds.) (1989). *Pictorial communication in virtual and real environments*. London, UK: Taylor & Francis.
- Finn, K.E., Sellen, A.J., & Wilbur, S.B. (eds.) (1997). *Video-mediated communication*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Gilkey, R.H., & Anderson, T.R. (1997). *Binaural and spatial hearing in real and virtual environments*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Goldberg, K. (ed.) (2000). *The Robot in the garden. Telerobotics and telepistemology in the age of the Internet*. Cambridge, MA: MIT Press.
- Kalawsky, R. (1993). *The science of virtual reality and virtual environments*. New York: Addison-Wesley.
- Krueger, M.W. (1991). *Artificial reality II*. New York: Addison-Wesley.

- Laurel, B. (1991). *Computers as theatre*. New York: Addison-Wesley.
- Mehrabian, A. (1976). *The psychology of places*. New York: Basic Books.
- Murray, J. (1998). *Hamlet on the holodeck*. Cambridge, MA: MIT Press.
- Quarrick, G. (1989). *Our sweetest hours: Recreation and the mental state of absorption*. Jefferson, NC: McFarland.
- Reeves, B., & Nass, C. (1996). *The media equation: How people treat computers, television, and new media like real people and places*. Stanford, CA: CSLI Publications.
- Rheingold, H. (1991). *Virtual reality*. New York: Summit Books.
- Schroeder, R. (1996). *Possible worlds*. Boulder: Westview Press.
- Sheridan, T. (1992). *Telerobotics, automation and human supervisory control*. Cambridge, MA: MIT Press.
- Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. London: Wiley.
- Turkle, S. (1995). *Life on the screen: Identity in the age of the Internet*. New York: Simon & Schuster.
- Wiener, M., & Mehrabian, A. (1968). *Language within language: Immediacy, a channel in verbal communication*. New York: Appleton-Centry-Crofts.

PAPERS

- Arglye, M., & Dean, J. (1964). Eye-contact, distance, and affiliation. *Sociometry*, 28:289–304.
- Barfield, W., Baird, K.M., & Bjorneseth, O.J. (1998). Presence in virtual environments as a function of type of input device and display update rate. *Displays*, 19:91–98.
- Barfield, W., & Danas, E. (1996). Comments on the use of olfactory displays for virtual environments. *Presence: Teleoperators and Virtual Environments*, 5:109–121.
- Barfield, W., & Weghorst, S. (1993). The sense of presence within virtual environments: A conceptual framework. In: Salvendy, G., Smith, M. (eds.) *Human computer interaction: Software and hardware interfaces*. Amsterdam: Elsevier, pp. 699–704.
- Biocca, F. (1997). The cyborg's dilemma: Progressive embodiment in virtual environments. *Journal of Computer-Mediated Communication*, 3(2). Available online: <http://www.ascusc.org/jcmc/vol3/issue2/biocca2.html>
- Darken, R.P., Bernatovich, D., Lawson, J.P., & Peterson, B. (1999). Quantitative measures of presence in virtual environments: The roles of attention and spatial comprehension. *CyberPsychology & Behavior*, 2:337–347.
- Draper, J.V., Kaber, D.B., & Usher, J.M. (1998). Telepresence. *Human Factors*, 40:354–375.
- Draper, J.V., Kaber, D.B., & Usher, J.M. (1998). Speculations on the value of telepresence. *CyberPsychology & Behavior*, 2:349–362.
- Ellis, S.R. (1996). Presence of mind: A reaction to Thomas Sheridan's "Further musings on the psychophysics of presence." *Presence: Teleoperators and Virtual Environments*, 5:247–259.

- Ellis, S.R., Dorighi, N.S., Menes, B.M., Adelstein, B.D., & Jacoby, R.H. (1997). In search of equivalence classes in subjective scales of reality. In: Smith, M., Salvendy, G., & Koubek, R. (eds.) *Design of computing systems: Social and ergonomic considerations*. Amsterdam: Elsevier, pp. 873–876.
- Flach, J.M., & Holden, J.G. (1998). The reality of experience: Gibson's way. *Presence: Teleoperators and Virtual Environments*, 7:90–95.
- Fontaine, G. (1992). The experience of a sense of presence in intercultural international encounters. *Presence: Teleoperators and Virtual Environments*, 1:482–490.
- Freeman, J., & Avons, S.E. (2000). Focus group exploration of presence through advanced broadcast services. *Proceedings of the SPIE*, 3959:530–539.
- Freeman, J., Avons, S.E., Meddis, R., Pearson, D.E., & IJsselsteijn, W.A. (2000). Using behavioural realism to estimate presence: A study of the utility of postural responses to motion-stimuli. *Presence: Teleoperators and Virtual Environments*, 9:149–164.
- Freeman, J., Avons, S.E., Pearson, D.E., & IJsselsteijn, W.A. (1999). Effects of sensory information and prior experience on direct subjective ratings of presence. *Presence: Teleoperators and Virtual Environments*, 8:1–13.
- Gilkey, R.H., & Weisenberger, J.M. (1995). The sense of presence for the suddenly deafened adult. *Presence: Teleoperators and Virtual Environments*, 4:357–363.
- Hamit, F. (1995). From telemedicine to remote telepresence surgery. *Advanced Imaging*, 10:21–35.
- Hatada, T., Sakata, H., & Kusaka, H. (1980). Psychophysical analysis of the "sensation of reality" induced by a visual wide-field display. *Journal of the Society of Motion Picture and Television Engineers*, 89:560–569.
- Heeter, C. (1992). Being there: The subjective experience of presence. *Presence: Teleoperators and Virtual Environments*, 1:262–271.
- Heeter, C. (1999). Aspects of presence in telerelating. *CyberPsychology & Behavior*, 2:325–335.
- Held, R.M., & Durlach, N.I. (1992). Telepresence. *Presence: Teleoperators and Virtual Environments*, 1:109–112.
- Hellig, M.L. (1992). El cine del futuro: The cinema of the future. *Presence: Teleoperators and Virtual Environments*, 1:279–294.
- Hendrix, C., & Barfield, W. (1996). Presence within virtual environments as a function of visual display parameters. *Presence: Teleoperators and Virtual Environments*, 5:274–289.
- Hendrix, C., & Barfield, W. (1996). The sense of presence within auditory virtual environments. *Presence: Teleoperators and Virtual Environments*, 5:290–301.
- Hoffman, H.G., Prothero, J., Wells, M.J., & Groen, J. (1998). Virtual chess: Meaning enhances users' sense of presence in virtual environments. *International Journal of Human-Computer Interaction*, 10:251–263.
- Horton, D., & Wohl, R.R. (1956). Mass communication and para-social interaction: Observations on intimacy at a distance. *Psychiatry*, 19:215–229.
- IJsselsteijn, W.A., de Ridder, H., Freeman, J., & Avons, S.E. (2000). Presence: Concept, determinants and measurement. *Proceedings of the SPIE*, 3959:520–529.
- IJsselsteijn, W.A., de Ridder, H., Hamberg, R., Bouwhuis, D., & Freeman, J. (1998). Perceived depth and the feeling of presence in 3DTV. *Displays*, 18:207–214.
- Kim, T., & Biocca, F. (1997). Telepresence via television: Two dimensions of telepresence may have different connections to memory and persuasion. *Journal of Computer-Mediated Communication*, 3(2). Available online: <http://www.ascusc.org/jcmc/vol3/issue2/kim.html>
- Lewis, A.V., & Cosier, G. (1997). With video? Pictorial culture and telepresence. *BT Technology Journal*, 14:64–85.
- Lombard, M. (1995). Direct responses to people on the screen: Television and personal space. *Communication Research*, 22:288–324.
- Lombard, M., & Ditton, T.B. (1997). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication*, 3(2). Available online: <http://www.ascusc.org/jcmc/vol3/issue2/lombard.html>
- Loomis, J.M. (1992). Presence and distal attribution: Phenomenology, determinants, and assessment. *Proceedings of the SPIE*, 1666:590–595.
- McGreevy, M.W. (1993). The presence of field geologists in a Mars-like terrain. *Presence: Teleoperators and Virtual Environments*, 1:375–403.
- Minsky, M. (1980, June). Telepresence. *Omni*, pp. 45–51.
- Mühlbach, L., Böcker, M., & Prussog, A. (1995). Telepresence in videocommunications: A study on stereoscopy and individual eye contact. *Human Factors*, 37:290–305.
- Murray, C.D., Arnold, P., & Thornton, B. (2000). Presence accompanying induced hearing loss: Implications for immersive virtual environments. *Presence: Teleoperators and Virtual Environments*, 9:137–148.
- Nash, E.B., Edwards, G.W., Thompson, J.A., & Barfield, W. (2000). A review of presence and performance in virtual environments. *International Journal of Human-Computer Interaction*, 12:1–42.
- Nass, C., Moon, Y., Fogg, B.J., Reeves, B., & Dryer, D.C. (1995). Can computers be human personalities? *International Journal of Human-Computer Studies*, 43:223–239.
- Nass, C., Reeves, B., & Leshner, G. (1996). Technology and roles: A tale of two TVs. *Journal of Communication*, 46:121–128.
- Nichols, S., Haldane, C., & Wilson, J.R. (2000). Measurement of presence and its consequences in virtual environments. *International Journal of Human-Computer Studies*, 52:471–491.
- Potter, W.J. (1988). Perceived reality in television effects research. *Journal of Broadcasting & Electronic Media*, 32: 23–41.
- Regenbrecht, H.T., Schubert, T.W., & Friedmann, F. (1998). Measuring the sense of presence and its relation to fear of heights in virtual environments. *International Journal of Human-Computer Interaction*, 10:233–249.
- Rice, R.E. (1993). Media appropriateness: Using social presence theory to compare traditional and new organizational media. *Human Communication Research*, 19: 451–484.
- Rubin, R.B., & McHugh, M.P. (1987). Development of parasocial interaction relationships. *Journal of Broadcasting and Electronic Media*, 13:279–292.

- Satava, R.M. (1995). Virtual reality and telepresence for military medicine. *Computational Biological Medicine*, 25:229–236.
- Schloerb, D.W. (1995). A quantitative measure of telepresence. *Presence: Teleoperators and Virtual Environments*, 4:64–80.
- Shapiro, M.A., & McDonald, D.G. (1992). I'm not a real doctor, but I play one in virtual reality: Implications of virtual reality for judgments about reality. *Journal of Communication*, 42:94–114.
- Sheridan, T.B. (1992). Musings on telepresence and virtual presence. *Presence: Teleoperators and Virtual Environments*, 1:120–126.
- Slater, M., Sadagic, A., Usoh, M., & Schroeder, R. (2000). Small-group behavior in a virtual and real environment: A comparative study. *Presence: Teleoperators and Virtual Environments*, 9:37–51.
- Slater, M., & Steed, A. (2000). A virtual presence counter. *Presence: Teleoperators and Virtual Environments*, 9:413–434.
- Slater, M., & Usoh, M. (1993). Representations systems, perceptual position, and presence in immersive virtual environments. *Presence: Teleoperators and Virtual Environments*, 2:221–233.
- Slater, M., Usoh, M., & Steed, A. (1994). Depth of presence in virtual environments. *Presence: Teleoperators and Virtual Environments*, 3:130–144.
- Slater, M., & Wilbur, S. (1997). A framework for immersive virtual environments (FIVE): Speculations on the role of presence in virtual environments. *Presence: Teleoperators and Virtual Environments*, 6:603–616.
- Snow, M.P., & Williges, R.C. (1998). Empirical models based on free-modulus magnitude estimation of perceived presence in virtual environments. *Human Factors*, 40:386–402.
- Stanney, K.M., Mourant, R., & Kennedy, R.S. (1998). Human factors issues in virtual environments: A review of the literature. *Presence: Teleoperators and Virtual Environments*, 7:327–351.
- Stanney, K.M., Salvendy, G., et al. (1998). Aftereffects and sense of presence in virtual environments: Formulation of a research and development agenda. *International Journal of Human-Computer Interaction*, 10:135–187.
- Stassen, H.G., & Smets, G.J.F. (1995). Telemanipulation and telepresence. In: Sheridan, T.B., (ed.) *Analysis, design and evaluation of man-machine systems 1995*. Oxford: Pergamon, pp. 13–23.
- Steuer, J. (1995). Defining virtual reality: Dimensions determining telepresence. *Journal of Communication*, 42:73–93.
- Sutherland, I.E. (1965). The ultimate display. *Proceedings of the International Federation of Information Processing Congress*, 2:506–508.
- Towell, J., & Towell, E. (1997). Presence in text-based networked virtual environments or "MUDS." *Presence: Teleoperators and Virtual Environments*, 6:590–595.
- Turing, A.M. (1950). Computing machinery and intelligence. *Mind*, 59:236.
- Usoh, M., Catena, E., Arman, S., & Slater, M. (2000). Using presence questionnaires in reality. *Presence: Teleoperators and Virtual Environments*, 9:497–503.
- Wann, J., & Mon-Williams, M. (1996). What does virtual reality NEED? Human factors issues in the design of three dimensional computer environments. *International Journal of Human-Computer Studies*, 44:829–847.
- Welch, R.B. (1997). The presence of aftereffects. In: Salvendy, G., Smith, M., & Koubek, R., (eds.) *Design of computing systems: cognitive considerations*. Amsterdam: Elsevier Science Publishers, pp. 273–276.
- Welch, R.B., Blackman, T.T., Liu, A., Mellers, B.A., & Stark, L.W. (1996). The effects of pictorial realism, delay of visual feedback, and observer interactivity on the subjective sense of presence. *Presence: Teleoperators and Virtual Environments*, 5:263–273.
- Williams, E. (1997). Experimental comparisons of face-to-face and mediated communications: A review. *Psychological Bulletin*, 84:963–976.
- Witmer, B.G., & Singer, M.J. (1998). Measuring presence in virtual environments: A presence questionnaire. *Presence: Teleoperators and Virtual Environments*, 7:225–240.
- Yano, S., & Yuyama, I. (1991). Stereoscopic HDTV: Experimental system and psychological effects. *Journal of the Society of Motion Picture and Television Engineers*, 100:14–18.
- Zahorik, P., & Jenison, R.L. (1998). Presence as being-in-the-world. *Presence: Teleoperators and Virtual Environments*, 7:78–89.
- Zeltzer, D. (1992). Autonomy, interaction, and presence. *Presence: Teleoperators and Virtual Environments*, 1:127–132.

REFERENCES

- Gorenflo, D.W. (1991). The most frequently cited journal articles and authors in introductory psychology textbooks. *Teaching of Psychology*, 18:8–12.
- LeUnes, A., Wolf, P., Ripper, N., & Anding, K. (1990). Classic references in the *Journal of Sport Psychology*, 1979–1987. *Journal of Sport & Exercise Psychology*, 12:74–81.
- White, M.J. (1987). Big bangs in perception: The most often cited authors and publications. *Bulletin of the Psychonomic Society*, 25:458–461.
- Sacks, M.H., Sledge, W.H., & Rubinton, P. (eds.) (1984). *Core readings in psychiatry: An annotated guide to the literature*. New York: Praeger.
- Varney, G.H. (1991). A study of the core literature in organization development. *Organization Development Journal*, 8:59–66.
- Burr, W.R., & Leigh, G.K. (1983, August). Famology: A new discipline. *Journal of Marriage and the Family*, 45:467–480.
- Lawson, A.W., & Lawson, G.W. (1991). Classic articles in the field of family dynamics of addiction: The early years, 1953–1980. *Family Dynamics of Addiction Quarterly*, 1:59–70.
- Bryer, J. (1969). *Fifteen modern American authors*. Durham, NC: Duke University Press.
- Lanier, H.W. (1926). "Million" books and "best" books. *The Golden Book Magazine*, 4:382–383.

10. Becker, O. (1951). *Master research guide*. Indianapolis: Bobbs-Merrill Company, Inc.
11. Day, C.C. (1993). The teaching of legal classics. *Indiana Law Review*, 26:263–332.
12. Venkateswarlu, T. (1988). Econometrics: Survey of course reading materials in universities in Canada and the United States. *American Economist*, 32:80–89.
13. Olsen, W.C. (1991). *Agricultural economics and rural sociology: The contemporary core literature*. Ithaca, NY: Cornell University Press.

Address reprint requests to:
W.A. IJsselsteijn
Human-Technology Interaction Group
Dept. of Technology Management
Eindhoven Univ. of Technology
P.O. Box 513
5600 MB Eindhoven, The Netherlands
E-mail: W.A.IJsselsteijn@tue.nl