of learning (training and transfer tasks) on search term formation and the implications for bibliographic instruction (see Goschke, especially pp. 250-253). Storms and De Boeck's "Formal models for intra-categorical structure" (Chapter 12) also has implications for assignment of subject terms in bibliographic databases.

Notwithstanding the criticisms given above, I hope this book will be met with the enthusiasm with which some faculty and students in library and information science embraced Lakoff's *Women, Fire, and Dangerous Things* a decade ago, forming groups to read, understand, and discuss implications of this research for contemporary librarianship.

Buyers in library and information science (from single practitioners to institutional libraries) will want to extend or update their collections with this book. Most certainly, this volume should be added to any collection—and course syllabus—that covers *Categorization (Psychology).*

REFERENCES

Bates, Marcia J. (1998). Indexing and access for digital libraries and the Internet: Human, database, and domain factors. *Journal of the American Society for Information Science, 49*, 1185-1205.

Brown, Mary E. (1991). Design for a bibliographic database for non-professional users. *Proceedings of the 54th Annual Meeting of the American Society for Information Science, 26*, 276-282.

_____. (1995). By any other name: Accounting for failure in the naming of subject categories. *Library & Information Science Research, 17*, 347-385.

Estes, William K. (1994). *Classification and cognition.* New York: Oxford University Press.

Glass, Arnold L., & Holyoak, Keith J. (1986). *Cognition.* New York: Random House.

Lakoff, George. (1987). *Women, fire, and dangerous things: What categories reveal about the mind.* Chicago, IL: University of Chicago Press.

Markman, Ellen M. (1989). *Categorization and naming in children: Problems of induction.* Cambridge, MA: MIT Press.

Rosch, Eleanor, & Lloyd, Barbara B. (Eds.). (1978). *Cognition and categorization.* Hillsdale, NJ: L. Erlbaum.

Smith, Edward E. (1990). Categorization. In D. N. Osherson & E. E. Smith (Eds.), *An invitation to cognitive science, vol. 3: Thinking* (pp. 33-51). Cambridge, MA: MIT Press.

Smith, Edward E., & Medin, Douglas L. (1981). *Categories and concepts.* Cambridge, MA: Harvard University Press.

Meadows, A.J. *Communicating Research.* San Diego, CA: Academic Press, 1998. 266 pp. $64.60 (cloth). ISBN 0-12-487415-0.

Reviewed by **Stephen P. Harter**, Professor, School of Library and Information Science, Indiana University, Bloomington, IN 47405 <harter@indiana.edu>.

Communicating Research is the latest book by Jack Meadows, author of several previous works on aspects of science, information technology, and publishing. The book under review can be viewed as an update to his 1974 work, *Communication in Science*, with two important differences. First, the present book deals not only with science but also with research in the social sciences and humanities. Second, a major new theme of this book is change, principally change that is wrought by technological advances. Yet, the reader of Meadows' earlier book will find much that is familiar.

In Chapter 1, "Change and Growth," Meadows takes us from the Greeks and the invention of the printing press to the rise of the modern research journal and the exponential growth of both research and researchers, as measured in a variety of ways. Chapters 2 and 3 outline how different research traditions have emerged, both among areas of specialization ("specialisms") and the larger divisions among the sciences, social sciences, and humanities. Merton's norms are introduced, as well as the ideas of Kuhn and Popper. Meadows argues that neither the Kuhnian concept of the paradigm nor Merton's norms fit the social sciences and humanities as well as they do science, and therefore that communication channels and patterns in these fields are also likely to be different. The idea of what constitutes acceptable research also differs among fields. The evidence presented in support of these claims rests in part on the bibliometric notions of "immediacy effect," Price's index, citation indexing, co-citation analysis, co-word clustering, and others. Problems with citation analysis are outlined. Several bibliometric phenomena are described, such as multiple collaboration and publication, the Matthew effect, and the Ortega hypothesis (this last discussion perpetuating the error in the literature that attributes this hypothesis to Ortega, as pointed out by Hoerman and Nowicke).

Chapter 4 treats formal and informal channels for communicating research, including reading, publishing, libraries, conferences, and human networks, among others. Effects of new electronic channels are then examined: electronic preprints, electronic journals, and e-mail. Meadows shows that these new channels are blurring distinctions that were previously clear between mass communication and personal communication, and between formal and informal communication.

The writing, editorial, and publishing processes are treated in Chapter 5. Various forms of publication are considered, including preprints, reports, theses, conference papers, refereed journal articles, and books. The extent to which these are employed as communication vehicles by researchers is shown to differ from field to field. Meadows describes the refereeing process and examines various forms of systematic bias. Fraud, error, and plagiarism are also considered. Finally, effects of new electronic publishing possibilities are examined, and Meadows demonstrates how the line between "published" and "unpublished" has become much fuzzier.

In the final chapter the author completes the circle, describing how researchers learn about new research: information retrieval from the perspective of the researcher. Meadows introduces the problems of knowledge representation, relevance, browsing, organizing personal information, intermediation, information scatter, and obsolescence. Meadows concludes with a discussion of how electronic communication is changing information retrieval differentially among the scholarly disciplines. He sees the eventual convergence of the various information sources, with the disappearance of a clear distinction between generalists and specialists, amateurs and professionals, and mass media channels and more specialized sources. This chapter seems to me to be more superficial than the others, perhaps because my own knowledge is greatest in this area. But to be fair, Meadows makes no claim that this book is a comprehensive survey of the topics treated; indeed, he explicitly states that it should not be so regarded.

Throughout the book, Meadows supports his statements with references to the literature from an impressive array of sources and a wide variety of disciplines. Annoying for me is the almost universal omission of textual mention of the authors of the sources cited (unlike the book's predecessor), that is, of phrases like "In a study of the information seeking behavior of chemical engineers, Jones found that...." If one wants to find that Jones is the source of a finding or an assertion one must turn to the references for that chapter, which are gathered together at the end of the book.

Meadows writes with clarity and with an almost total absence of jargon. Fortunately for an author writing about communication, he communicates extremely well. But this comment does not apply so well to the numerous tables scattered throughout the text. Sometimes there is insufficient information provided for the reader to understand the numbers that are presented in these tables. The book has an adequate index.

In the Postscript, Meadows reiterates the two themes of the book as he sees them: change and diversity. I would add a third theme that describes the nature of many of the changes: the idea of a blurring, a fuzzing of distinctions that heretofore were much more clearly drawn. This increased ambiguity will itself cause additional uncertainty and change, in my view, which will especially impact some of the major communication channels. Meadows specifically singles out publishers and libraries as institutions that will have to adapt, and quickly, to these changes. Can these organizations survive the transition from print to electronic communication of research? Meadows asks but does not answer this question—and he hints that libraries will have the toughest time of all.

This is a valuable book. It puts the changes that we are witnessing in the communication of research into a context—the long, evolving history of doing and communicating research in the various disciplines. It clarifies and offers insight into where we have been and where we are likely to go in this brave new electronic world, and why.

REFERENCE

Hoerman, Heidi Lee, & Nowicke, Carole Elizabeth. (1995). Secondary and tertiary citing: A study of referencing behavior in the literature of citation analysis deriving from the "Ortega Hypothesis" of Cole and Cole. *Library Quarterly, 65*, 415-434.

Pinelli, Thomas E., Barclay, Rebecca O., Kennedy, John M., & Bishop, Ann P. *Knowledge Diffusion in the U.S. Aerospace Industry: Managing Knowledge for Competitive Advantage*. Greenwich, CT: Ablex, 1997. 1052 pp. $157 (cloth). ISBN 1-56750-225-3.

Reviewed by **Gillian Allen**, Visiting Assistant Professor, School of Information Science and Learning Technologies, University of Missouri, Columbia, MO 65211 <sisltga@tiger.coe.missouri.edu>.

This book, divided arbitrarily (p. xv) by the authors into two volumes, presents the results of the 10-year NASA/DoD Aerospace Knowledge Diffusion Research Project (the Project). It purports to examine multiple aspects of knowledge diffusion in the large commercial aircraft (LCA) sector of the U.S. aerospace industry (p. xiii), but most of the research findings pertain to the aerospace industry as a whole. Individual chapters are written by one or more of the authors and/or members of a group of eleven collaborators.

The first four chapters of the book are intended to provide background on the evolution of LCA manufacturing in the U.S. and on knowledge diffusion. Chapter 1 presents a brief historical overview from 1903 to 1966 of the development of the LCA sector (and the military aircraft industry and flight in general). A brief theoretical introduction to the implications of this history for knowledge diffusion follows. The book is extensively researched, but uses only secondary sources. For example, Chapter 1 provides 87 chapter references, and a significant proportion of these were taken from the literature of the 1980's (38% of the citations were to articles written in the 1980's and 38% of the citations were to 1990's literature). Chapter 2 discusses the historical development of U.S. public policy concerning LCA, although much of this discussion focuses more on national policy and the development of the military aircraft industry than on the LCA sector. Some observations about the relationship between U.S. public policy and knowledge diffusion end the chapter. An impressive group of 179 chapter references is provided, two-thirds of which were published before 1990. Chapter 3 presents a brief and selective historical review and critique of U.S. aeronautical science and technology policy supplemented by 23 secondary readings (p. 96). Chapter 4 focuses on NASA's system for disseminating the results of federally-funded aeronautical research and technology, and includes a model depicting knowledge diffusion via the U.S. Government Technical Report (p. 160).