For information address:

SAGE Publications, Inc.
275 South Beverly Drive
Beverly Hills, California 90212

SAGE Publications India Pvt. Ltd.
C-236 Defence Colony
New Delhi 110 024, India

SAGE Publications Ltd
28 Banner Street
London EC1Y 8QE, England

Printed in the United States of America

Library of Congress: 76-45943
ISBN 0-8039-2000-8

FIRST PRINTING

COMMUNICATION YEARBOOK 7

edited by

ROBERT N. BOSTROM

Associate Editor

Bruce H. Westley

an Annual Review Published for the International Communication Association

SAGE PUBLICATIONS
Beverly Hills / London / New Delhi

7 ● Communication Research and the New Media Technologies

FREDERICK WILLIAMS ● RONALD E. RICE

University of Southern California

OUR basic thesis in this chapter is that although we are undergoing a veritable revolution in new media technologies—in technical innovation, aggressive marketing, and deregulation—our most serious challenge is to understand their impacts on human behaviors and institutions. This is the task of the social scientist of communication, and many of our contemporary theories and research techniques will aid us in meeting the challenge. The technologies are new, but our deeper human uses of them are not necessarily so. We will still communicate in order to relate personally to other human beings, to operate organizations, and to interact with the public structure of our societies. The application of social scientific thinking to this problem area should not only illuminate the impacts of technologies on these traditional human purposes, but should enable us to maximize their benefits.

Most of the technologies we refer to have evolved from advances in telecommunications and computing, and, in particular, the combination of the two. The new devices and services, in the parlance of our field, are simply *new media* variations or extensions. These media extensions include one- and two-way cable, videotex and teletext, electronic mail and computer conferencing, audio and video conferencing, distributed and direct broadcasting satellites, word processing, integrated office systems, videodiscs and videocassette recorders, personal computers, and computer networks.

The new media loosen the constraints of traditional media, yet allow the use of combinations of attributes of each of those media. Indeed, we are able to talk about certain functional characteristics of new media with which communication research is already familiar. New media, like previous media, are

AUTHORS' NOTE: The authors would like to thank the following people for their comments concerning ICA divisional interests in new media: Loyd Pettegrew, Lynda Lee Kaid, Mary Anne Fitzpatrick, Everett Rogers, Rolf Wigand, and Maureen Beninson.

Correspondence and requests for reprints: Frederick Williams, Annenberg School of Communications, University of Southern California, University Park, Los Angeles, CA 90007.

basically extensions of human senses and effectors. In fact, some of the distinctions between the new media and traditional media are not as discontinuous as are the distinctions between traditional media and natural media such as hearing, seeing, or speaking.

Because many new media are interactive and may be used in a variety of new situations—such as flexible interpersonal communication, group communication, and private use of public information—the categorical distinction between mass and interpersonal communication is giving way to a continuum of communication behaviors.

With traditional communication media, there was often a visible distinction between sources of personalized information and impersonalized communication. If individuals wanted to learn more from one another or to affect one another's behaviors, they engaged in an interactive situation, where nuances and responses would arise quickly based on questions or statements as well as the nonverbal channel. That sort of personalized instruction or information is not fully possible from traditional television or newspapers. However, it is no longer available only from unmediated conversation, either. We can access personal information sources via computer or videotex networks to find out more about information we want. Or we may use electronic mail or teleconferencing to interact with others who are separated by time and space.

Sources of satisfaction for personal communication needs are no longer limited to face-to-face contexts, traditional mail, or telephone. Perhaps the new media highlight the fact that although satisfaction of individual needs was inherently possible through most traditional media, as long as media were marketed to mass audiences, there was less potential for this to occur. One implication, discussed later, is that theories involving media uses and needs satisfactions should be expanded to accommodate the ability of certain new media to satisfy different and perhaps more traditional interpersonal needs.

We have organized our review along the above-mentioned continuum, moving from personal to public contexts of communication uses. In so doing, we hope to reinforce our earlier point that the traditional categorized distinctions among different types of communication are being reduced by technological change.

ON THE PERSONAL QUALITIES OF MASS MEDIA TECHNOLOGIES

Among the issues on the personal level of communication is that the new technologies are often claimed to be "impersonal" or to "depersonalize" their users. Yet research into the subjective qualities of media and of their

uses and gratifications indicates that these effects may be as much a consequence of our restricted use of a medium as they are of the physical restrictions it may impose. In this section, we first survey some of the concepts advanced by Short, Williams, and Christie (1976) in their monograph, *The Social Psychology of Telecommunications*, then add a few notes about the interaction of media "personalness" and uses and gratifications.

The "Social Presence" of a Communication Medium

How does one sense that an act of communication is "person" oriented, that there is the presence of another individual closely associated with the message? As a practical example, this is the difference between a friendly conversation and a business letter, a pleasant telephone conversation and a complex computer printout, or a warm conversation between two lovers and the proverbial "Dear John" letter. This personal or social differentiating quality of communication acts is what Short et al. (1976) have stressed as so critical in the study of the psychological aspects of using telecommunications technologies. They call it "*social presence.*" In operational definition, it is reflected in how a participant in a communication exchange would fill in such semantic differential scales as "unsociable-sociable," "insensitive-sensitive," "cold-warm," and "impersonal-personal" when evaluating the medium used.

As mentioned above, you might expect that a business letter would typically have less social presence than a face-to-face conversation. Indeed, studies have shown this. Table 7.1 provides one such set of ratings of perceived social presence.

Chief among the reasons given for the differentiations of social presence are the stimulus-conveying restrictions of some technologies as compared with others. The most salient restrictions are those related to the conveyance of the nonverbal aspects of communication. For example, the telephone cannot convey the kinesic and iconic dimensions of a personal conversation. But a combined audio and television link can allow the exchange of many such

Table 7.1
Social Presence Ratings of Five Media

Communication Mode	*Social Presence**
Face to face	0.81
Television	0.24
Multispeaker audio	−0.18
Telephone audio	−0.52
Business letter	−0.85

Source: Short et al. (1976, p. 71).
*Social presence index ranges between +0.9 and −0.9.

cues. We also suggest that the amount and type of channel *redundancy* may affect the appropriateness and effectiveness of a medium. That is, highly interpersonal relationships may have kinds of uncertainty that can be reduced only by sufficient amounts of proxemic and kinesic information.

Two further qualities of a medium are also particularly relevant to social presence—the potential for *interactivity* and the *privacy versus public* quality of the medium. The former is simply the potential for immediate, two-way exchanges, and its contribution to social presence. The privacy or public aspect of a medium refers to the individual's consciousness of whether "outside" individuals may be able to monitor an exchange. The less the privacy, the greater the potential for communication to become less personalized and, hence, the lower the social presence.

One additional consideration is that the context in which we choose a medium may itself affect attitudes about social presence. For example, a written note between two individuals might be taken as low in social presence if one had rejected the opportunity to speak to the other personally. Or a telephone call over a long distance might be taken as higher in social presence than one across the street if the latter were substituted for a face-to-face conversation.

The above reasoning is consonant with contemporary theory in interpersonal communication (for example, see Miller, 1976, 1978; Miller & Steinberg, 1975). In general, interpersonal communication evolves from communication based on cultural or social stereotypes to a mutual focus on individuals. This necessitates a gathering of "personal information" in the situation.

Several media-related factors are critical for interpersonal communication; for example, the nonverbal code weighs heavily in this process and any restrictions on its exchange are apt to make communication more impersonal. Also, the movement of communicative interactions from impersonal to personal levels benefits according to the potential for interaction. Further, that others may be eavesdropping on a conversation also is likely to make highly individual communication less probable. Finally, movement to a personal level of exchange is not likely to be encouraged if it begins with the recognition that the other person has intentionally chosen a less personal medium of communication.

All of the foregoing factors are subject to an interaction between the prerequisites of "personalness" in communication and the technical qualities of different media. But also advanced by Short et al. is that we still have substantial opportunity to modify the social presence of our communication by varying message qualities. Although a telephone conversation is apt to be less personal than a face-to-face conversation, we can attempt in our use of language to make it more personal. Even computers are supposedly becoming "user friendly" through reduced programming jargon and manuals written in a nontechnical and personal style. Indeed, Hiemstra (1982), by analyzing the interaction sequences and content of a computer conference,

found that most of the forms of the very interpersonal process of "saving face" were maintained even in this text-based communication medium.

The point of all this is that in choosing our alternatives among the new technologies—such as electronic messaging over voice telephone, teleconference over face-to-face meeting—there is a dual consideration of both technical restrictions of a medium as well as our willingness to overcome those restrictions by persuasive and stylistic strategies. We must also take into account the perceptual sets that others may have when they are invited to participate in a particular medium. An individual may have received so many impersonal telex messages that even if a sender employed a variety of personal stylistic devices, the receiver might overlook them because no personal communication was expected. (This is akin to parents who complain about the use of instructional television in schools based on the belief that nothing serious can be learned from a "light entertainment" medium.)

In all, if we are to consider the personalness (or potential "depersonalization") of alternative technologies of communication, we might consider more specifically the concept of *social presence*. If we require that communication be able to move to interpersonal levels (that is, individual, rather than strictly role or stereotype oriented), as in motivation or conflict resolution, we will want to select a medium with high social presence and capitalize on it in our message formulations. If we are technically restricted—as when a teleconference is audio only—then we may want to put a special emphasis on stylistic and persuasive strategies that increase social presence. At the other extreme, if our communication does not particularly require the quality of social presence, as in a purely information exchange or simple direction giving, there may be no need to invest in expensive technologies for purposes of obtaining it. For example, if the members of an organization have a need to coordinate their calendars, a modest shared computer file (as a "computer conference") might be far superior to face-to-face meetings (see Hiltz & Turoff, 1978; Rice, 1980b; Short et al., 1976).

There is nothing really so different in the foregoing consideration from the way that we humans have always selected our media on grounds of appropriateness. The new technologies are not, in an overall sense, inherently impersonal or personal. Our main challenge is to understand better their distinguishing qualities and, even more so, to develop our stylistic and persuasive strategies for their most effective use.

"Personalness," Uses and Gratifications, and Other Attitudinal Dimensions

Two reports of ongoing studies in the attitudinal correlates of communications technologies offer ongoing evidence of the distinction of "personalness" as well as other attitudinal dimensions. In one study (Williams, Phillips, & Lum, 1982), 12 different media were rated by university students according to their importance for fulfilling 34 "media-related needs" as defined in an earlier study by Katz and his colleagues (Katz, Gurevitch, & Haas, 1973) of uses and gratifications. As would be expected, very self-oriented or personal needs that were rated to be important to the students (for example, "to know myself," "to participate in discussions with my friends," "to participate in the experience of other people") were all highly associated with "face-to-face" communication. Items that were less likely to require a quality of social presence in communication ("to understand what goes on in the U.S.," "to get to know the true quality of our leaders," "to know what the world thinks about the United States") were associated much more with mass media (newspapers, broadcast television) than with more intimate forms of communication.

Although these findings can be considered commonplace, it was of interest to the researchers to see how certain other media technologies would be differentiated according to these needs. Particularly visible in the results was how the telephone patterned markedly in accordance with most person-centered needs that might benefit from a social presence quality. For example, use of the telephone was most highly related to the need "to spend time with friends." This is in contrast to the generalizations of Short et al. (1976), who saw the telephone as a somewhat impersonal medium as used in business. We mention this finding not so much as evidence of attitudes of certain groups, but as evidence that we can probably assume that the telephone lends itself to a wide degree of variation in the existence or importance of social presence or personalness in its use. Or, put another way, social presence as associated with a telephone is probably far more a function of context and needs gratifications than it is of the quality of the medium. (It is ironic, we think, that although the telephone has now been with us for a century, with the exception of the research referenced in Pool's work [1977, 1982], the serious study of the telephone has been largely overlooked in communication or social psychological circles.) Of the newer technologies included in the present study, university students related videotape and cable television to such needs as "to be entertained" or "to escape from the reality of everyday life."

Although Williams et al. (1982) acknowledge theoretical shortcomings of the uses and gratifications categories, the results of this study do point out considerable emphasis on personalness in rating the importance of needs. Further, the results are persuasive evidence that individuals may expect varying degrees of social presence (or lack thereof) in the media they use as this relates to the person-oriented needs they are seeking to gratify.

The second study (Phillips, 1982) also provided evidence of the importance of personalness in differentiating among media or communication technologies, but also suggested the relevance of certain other attitudinal dimensions. In this research, university students' discussions of media technologies were content analyzed for adjectives that were subsequently the

Table 7.2
Media Functions as Portrayed by Multiple Discriminant Analysis

	Functions		
Medium	*Familiarity*	*Importance*	*Personal*
Radio	1.33*	−.34	−.07
Broadcast television	.57	−.55	−.47
Cable television	−.11	−.12	.07
Newspaper	1.98	.42	−.90
Videocassette recorder	−1.66	−1.05	.27
Telephone	.97	.84	1.64
Computers	−2.08	1.92	−.49

Source: Phillips (1982).
*Centroids.

basis for a 25-scale semantic differential instrument. Students evaluated 7 media: radio, broadcast television, cable television, newspapers, videocassette recorders, the telephone, and home computers.

A subsequent multiple discriminant analysis yielded three main functions, which were subjectively labeled (1) "familiarity," (2) "importance," and (3) "personalness." The discrimination of these media on each of the three functions can be seen in the centroid values given in Table 7.2. (Positive numbers are in the direction of the function labels; negative numbers are their opposites.)

The first point to note is that unlike Short et al.'s (1976) findings, subjective qualities of familiarity and importance preceded personalness as discriminating attitudinal dimensions among the different media. Although these results, due to methodological and respondent differences, are not directly comparable with the earlier study, we suggest that the subjective correlates of media have more of a multidimensional quality than stressed in the earlier research. Distinctions in terms of familiarity were what most researchers would expect; for example, newspapers were maximally distinguished from computers. Yet despite their unfamiliarity, computers, as shown in terms of function 2 (importance) are rated as relatively more important than newspapers. Further, on this function the newer technologies of videocassette or cable TV are relatively unimportant. Finally, in terms of personalness, the telephone again is highly rated, with newspapers being the opposite.

Other research on the dimensions of media use for needs gratification and their interaction with other subjective attributes, particularly in organizational and task-oriented settings, are reviewed by Rice (1983).

Two Research Opportunities

Another opportunity to consider social dimensions of new media is in the area of entertainment. Except for a few authors (Mendelsohn, 1966; Stephenson, 1967; Tannenbaum, 1980), this topic has generally been ignored by communication researchers. This oversight is particularly glaring given that "most people use most media most of the time for entertainment" (Comstock, Chaffee, Katzman, McCombs, & Roberts, 1978; Roberts & Bachen, 1981). For example, videogames offer an opportunity to study significant cultural aspects of communication as they involve symbolic, mythic, social, and entertainment elements. They not only provide instant public status (for a select subculture), but offer very public, interactive experiences. Observers wait in line, kibbitz, offer support, and feel intimately part of the experience of the performer of the moment. This is more intimate than hockey fans shouting at players, and more active than a family watching television. Videogames offer public communication situations that are participatory.

For another area, even information science literature is beginning to apply and extend a uses and gratifications approach to new media. Taylor (1982), for example, argues that because problems require specific information for resolution, and arise from specific environments, designers of information systems should shift from concentrating on technology and content to the user's "environment." The environment sets the criteria for the value of information that users perceive when solving problems. Information systems include a series of processes whereby value is added to data to make knowledge, but we can understand this value only by understanding users' perceptions of the value of information they seek and receive. Like Dervin (1981), Taylor suggests that we should design systems and train facilitators to find out such things as: How/Why/When do you need to know? What do you know already? How will this help you? In what form do you need it? Do you need information to inform, decide, confirm, stop worrying? As Mendelsohn (1974) argued concerning the policy implications of the uses and gratifications approach, Taylor argues that we can use this research approach to better provide information that satisfies needs (or at least gratifies expectations).

ORGANIZATIONAL OR GROUP CONSIDERATIONS

The Impact of New Media on Organizations

The introduction of new media into organizations is creating innumerable field experiments in the adoption, use, and impacts of communication. Although these impacts are reviewed in detail elsewhere (Keen, 1981; Kerr & Hiltz, 1982; Rice, 1980a), we will consider several major implications in the present review.

One implication is that new media may be most effective when they reduce the flow of information in favor of consolidation and application of messages within organizations. Moving the same kind of information faster to more people is a shortsighted goal. Consider the observation of Feldman

and March (1981, p. 174), as they argue that organizational "use of information is embedded in social norms that make it highly symbolic."

(1) Much of the information that is gathered and communicated by individuals and organizations has little decision relevance.
(2) Much of the information that is used to justify a decision is collected and interpreted after the decision has been made, or substantially made.
(3) Much of the information gathered in response to requests for information is not considered in the making of decisions for which it was requested.
(4) Regardless of the information available at the time a decision is first considered, more information is requested.
(5) Complaints that an organization does not have enough information to make a decision occur while available information is ignored.
(6) The relevance of the information provided in the decision-making process to the decision being made is less conspicuous than is the insistence on information.

If actual communication is changed, then perhaps the relationships that organizational communication research has uncovered between communication and other organizational variables will also change. That is, new media impacts may condition or falsify hypothesized relationships developed by past research.

Currently, computer conferencing and the more sophisticated electronic mail systems are particularly important for this discussion because they are preeminently *group* media (Hiltz & Turoff, 1978). Designers, managers, or users can call on the processing capabilities of the computer to *structure* communications. For example, a person may participate in widening circles of interaction-programmed access facilitated by the computer, perhaps according to the needs of the individual, the manager, and the organization. These interactions may include personal notebooks, dyadic personal messages, joint authorship, "closed" group conferences, public read-only bulletin boards, systemwide public conferences, and the like. The system can also provide immediate feedback on the group's performance. Such media are called "computer-based communication systems."

Recent analyses by Hiltz (1982) and Rice (1982) specifically consider aspects of group communication networks on the acceptance and impacts of these systems. A new group communication medium will be used partly to the extent it facilitates communication with other people already known. Usage has also been shown to increase the number of new people to whom messages are sent and from whom messages are received, the number of people in categories of "friends" and "close friends," and the general interconnectedness of the system of users. Perceived productivity from system use is related to communication with the new people one meets on the system. Moreover, it seems crucial that members of groups using this medium begin early to reciprocate the exchange of messages with other communicators, if they are to continue receiving messages. Task-oriented groups tend

to become isolated within a large computer-based communication system, while nontask groups are freer to "scout" the system of other group members and maintain above-average information flows.

Ongoing controlled experiments comparing such media with face-to-face group communication show that computer-mediated groups take longer to make research decisions, while there is more equal participation by all members (Hiltz, 1983; Johansen, Vallee, & Spangler, 1979). This more even participation should lead or constrain the emergence of a group leader, which may in fact decrease the group's ability to perform unstructured, judgmental tasks. In computer-mediated groups, there tend to be greater shifts by individuals from their initial choice positions, less inhibition, and more polarization. The quality of decision is typically equal, although face-to-face groups tend to report greater consensus. This may be an artifact of the decreased choice shift possible in face-to-face groups due to nonverbal and status information available to constrain group deviants. These group "holdouts," by the way, sometimes offer the highest-rated solutions. Furthermore, the quality of decision tends to be unrelated to degree of consensus. That is, face-to-face groups may agree more, but perhaps about lower-quality decisions!

The above impacts could be interpreted within the framework of Wiio, Goldhaber, and Yates (1980) for a contingency approach to organizational communication research. We suggest that new media, because of the above kinds of impacts, are a new contingency. For example:

(1) Electronic messaging can increase cross-organizational communication, even over diagonal, divisional relations. Will such messaging weaken the relevance of organizational level to information and communication patterns?
(2) Will early access to other organizational members through electronic mail weaken the relationships among tenure, communication, and satisfaction?
(3) Will the increased span of control by managers, made possible by office automation, lead to decreased superior-subordinate relationships and a shift to less interpersonal performance evaluation methods?
(4) Will the expansion in the number of messages sent to and received from new members lead to "better relationships" and more satisfaction with organizational outcomes (Rice & Case, in press)?

Of course, one's job in an organization or specific role in a group requires certain kinds of tasks. For example, we know that managers spend most of their time communicating and we know something about how that time is allocated. Most communication is in face-to-face activities, and only a small part of it is likely to be replaced by text-oriented, electronic media. Voicemail may be another thing. Also, individuals have personality traits that may lead them to prefer more or less social interaction. Finally, the way in which media constrain the structure of group communication also affects the appropriateness of a given medium.

The interaction of all the foregoing factors leads to a generalized notion

of *media style*. Media style is the interaction of media attributes—including "social presence"—role requirements, and individual preferences in the (organizational) use of media. Indeed, in recent analyses (Rice & Case, in press), once media style was controlled for, the typical association between respondents' use of an electronic messaging system and reported benefits of such use decreased dramatically to below significant levels. The implication here is that new media should not be forced on groups because of the benefits we know are possible from such technology. Rather, we need to match media usage to organizational tasks, group roles and norms, and individuals' personalities and preferences.

The Issue of Productivity

Most of the new communication technologies for the office are sold on the promise of increasing *productivity*. Increasingly, too, productivity promises directly mention so-called information work. The practical side of this problem is that when queried on what they mean by "productivity," most manufacturers or vendors give examples that refer only to very specific aspects of clerical work. Yet the information in most advertising and promotions regarding use of the new technologies in organizations is that somehow management itself will increase in productivity. Unfortunately, on this level there are few concrete examples and still fewer theoretical attempts to conceptualize the relationship between communication technologies and improving the productivity of the manager. In this section we explore some of the contemporary practices and thinking in this area.

Among the differences found in the literature are contrasts between clerical and managerial levels of productivity with information work and, also, the issue of whether people who work in industries that manufacture communications equipment are "information workers" of sorts (see Porat, 1978). One level where definitions of productivity are similar is in applying an analogy of the factory worker when gauging an information worker's output. Just as a factory worker on a production line may turn out a particular number of work units per hour, it is possible to consider how, for example, a secretary may complete analogous work units. In this respect, a secretary's productivity in strictly clerical work might be gauged in terms of keystrokes per hour, words per hour, letters per hour, or pages per hour, depending on the unit of interest to the manager. These measures are converted to cost figures.

A productivity assessment of a secretary's day before and after the installation of, say, a word-processing system, could be realized in terms of these types of figures. Moreover, if the clerical worker's activities were divided into a variety of tasks (typing, telephoning, filing, errands, and so on), it would be possible to see where the installation of an office technology is having an impact. Presumably, installation of a word processor should increase productivity of typing and writing, but probably would have no impact at all on

time spent running errands. Electronic messaging could likely reduce the "shadow costs" of media (delays due to busy signals, transforming information from one medium to another), but may not affect messages themselves (Uhlig, Farber, & Bair, 1979).

What is excluded in productivity assessments are types of activities that involve reasoning from information. For example, the act of keeping a calendar often entails more than simply putting down times and dates. It may require setting priorities, devising a schedule, and making decisions about how to cluster tasks or appointments. Valuating the productivity of decision making is much more elusive and complex. Not only must this be taken into account in a clerical worker's productivity, but it is the main focus of a manager's work. That is, managerial tasks involve using information, not transforming it (see Paisley, 1980). Most of the manager's time is spent in communicating, rather than in performing transactions on data.

The manager is a much more complex and elusive type of information worker. However, just as clerical workers do some "management work," so, too, do managers get involved in clerical tasks. Such tasks are an opportune target for productivity improvement. Indeed, because of higher managerial salaries, it is the "real payoff" in the use of organizational communication technology (Bair, 1979). Lowenstein (1978) stresses that we should try to identify these clerical activities of the manager and reassign as many of them as possible to the clerical worker. Moreover, new office communication systems may make this potential for transfer more visible and easily accomplished.

We might better refer to the manager as a "knowledge worker" rather than an "information" one. This is the type of knowledge work that is especially stressed in Bell's (1976) concept of people "who make a living with knowledge." Still, however, gauging productivity in knowledge work is a truly practical as well as conceptual challenge. It is *quality* rather than *quantity*, and *effectiveness* rather than *efficiency* that bear assessment when gauging the productivity of the modern manager.

Although there are indirect or interim strategies for attempting to assess the impact of new technologies on this kind of knowledge work (subjective evaluation by superiors, questionnaires measuring "decision quality" or "communication satisfaction"), they do not have the objective qualities that can be achieved with work-per-unit-of-output assessments. But in the larger picture, the ultimate and quantifiable gauge of impact for a business would be its long-term social and financial health, as eventually reflected in the profit-loss statement.

We simply do not have adequate practical or even adequate theoretical conceptualizations of the link between the implementation of new office technologies and the quality of managerial behavior with them. Partly this is because of a preoccupation with the relatively easier task of gauging clerical productivity. It is also because larger research organizations have placed

more of their emphasis on the development and human adaptation of the technologies rather than on the broader questions of managerial productivity (Pake, 1982).

Still adding to the frustration is the inadequate conceptualization of how improvements in communication, in general, affect the success (or productivity) of an organization. As so well reviewed by Downs and Hain (1982), although we have myriad practical suggestions about how to improve executive communication, we lack an adequate conceptualization of the detailed relationships between effective communication and the success of an organization. Unfortunately, then, it is not so easy to take the likely improvements in managerial decision making or communication technologies and "borrow" an earlier theory so as to relate them to corporate success.

THE PUBLIC DIMENSION

The Information Society and Media Organizations

A growing number and variety of scholars and researchers are claiming that we are becoming an *information society* (Bell, 1976; Dordick, in press; Drucker, 1969; Ito, 1981; Machlup, 1962; Porat, 1978; Schement, Lievrouw, & Dordick, in press). By this is meant that the majority of economic activities in the United States are involved with creating, handling, processing, maintaining, and distributing information. Information has become a prime component of work, which, in turn, may have profound effects on the structure and operation of our society.

The change to an information society will also require new media organizations (such as data base brokers), as is already reflected in the complex interconnections among media and other institutions (consider the growing interaction among television, cinema, video music, radio, books, and videogames). Fombrun and Astley (1982) discuss the growth of such separate industries into a "telecommunications community."

From a theoretical perspective on media organizations (Hirsch, 1977), the new media are also affecting the production, delivery and organization of traditional media. The old categories of media organizations are changing as new media are used, for example, in electronic publishing (Turoff & Hiltz, 1982), out-of-school education (Paisley & Chen, 1982), and at-home library services (Cherry, 1980).

If researchers continue using traditional categories of information and media producers and distributors, they will increasingly overlook new concepts in the public media. Consider the concepts of gatekeeping and agenda setting (McCombs & Shaw, 1977). The argument goes that due to professional norms, editorial philosophy, technological considerations, and the sheer volume of content, extensive gatekeeping is performed by editors, disc jockeys, and television broadcasters. The content that is chosen for further

distribution tends to tell audiences "what to think about" if not what to think. A tiny proportion of "content" sets the agenda.

Overlooked in current research is the effect of home-based electronic newspapers already available. When individuals can use indices based on their personal interests to search through the entire AP, UPI, and Reuters newswires, then who is doing the gatekeeping? How will agendas be fragmented or segmented? Will this segment of the audience develop pictures of social reality at odds with their less sophisticated neighbors who use traditional media? Communication researchers should test current models for contingent conditions and further subgroup effects.

The fundamental issue here is choice and diversity. With satellite distribution, even a national medium such as *Time* magazine can produce issues for different regions and even demographically segmented audiences within a region. Gannett's satellite-transmitted *USA Today* newspaper provides truly national news as well as locally inserted news and advertisements. While the early criticism of traditional media was that they were creating a mass, homogenized culture, now we hear criticism that the new public media will fragment and isolate us.

As new media organizations begin to reach audiences that before could only be tapped by, say, the three television networks, the economics change in ways that may lead to audience segmentation similar to the format and audience changes earlier seen in magazines and radio. This segmentation may, however, at first come along previous lines of social stratification. Further, from the extra-organizational perspective, the major corporations may attempt to develop and control new media and their content, leading perhaps to the corporate "privatism" of information (Schiller, 1982). Or certain status groups in society may become information elites due to their higher access to new media. More important, insofar as new media allow greater message flow among their users, high-status elites could increasingly coordinate their power over others.

The segmentation of markets can also take the form of social stratification and create "knowledge gaps" (Ettema & Kline, 1977). These gaps could even take the form of cultural preferences for different media. The youth in one neighborhood achieves status from, and becomes addicted to, the large cassette radio, while a youth in another neighborhood invites the gang over to play on the home computer. These differences may accentuate socioeconomic and cultural differences.

Further, the inroads of new media in our national television media, along with the access of certain socioeconomic and cultural groups to home information services, could result in reducing "free" commercial television to a very low quality level. In the past, the knowledge gap hypothesis posited that with new means for communication, groups of users might increase their knowledge, but the information elite would rise to an even higher relative level. Now we can also consider how some groups may even decline in knowl-

edge levels or access to cultural diversity. This is a clearly testable hypothesis as the media environments of different social groups change due to interactions between new and traditional media organizations and their markets.

We may now be in an era in which we have more and more organizations creating new markets, rather than just satisfying perceived needs. That is, the commercial exploitation of new media has tried to establish new communication needs. For example, the gross revenues in videogame equipment and programs has risen from a virtually nonexistent level in 1977 to an approximately $3.5 billion business in 1982. It is possible that humankind is malleable enough in communication behaviors and needs that new media may be creating new needs—needs that either have not been satisfied before or that are externally created. Indeed, it is a testable question whether humans have still unsurfaced communication needs.

Social Diffusion of New Technologies

In this section, we consider personal computers, word processing, and medical information systems as topics of diffusion research. The first two are diffusing quite rapidly, while the last seems stymied by factors often overlooked by diffusion research. (Nor is it the only technology meeting obstacles. Videotext and videodisc systems seem stymied by lack of standards and software, as well as by an abundance of sufficiently satisfactory alternatives; see Rice & Paisley, 1982.)

Diffusion of most new media, however, seems to confirm Olshavasky's (1980) analysis of the change over time in the general rate of innovation adoption. Looking at 25 household innovations, and measuring the time to adoption as the number of months between 5 percent and 95 percent adoptions, Olshavasky found a significant coefficient for the successive year each innovation was introduced. More recent innovations seem to diffuse more rapidly. Individual and organizational decision processes may well be overwhelmed, to be replaced by conformity, imitation, and recommendations. Diffusion research needs to consider this abrupt transition in adoption behavior.

Personal computers are being taken home and to the office in increasing numbers. Over 400,000 were sold in 1980, yet they were first sold only in the mid-1970s. By 1985, 10 million households are expected to have personal computers (Rogers, Daley, & Wu, 1982). In the university organization, educators and support personnel are being introduced to personal computers as well as electronic mail (discussed above) and other systems supporting researchers and invisible colleges (Hiltz, 1982).

Case and Daley (1983) report that of 832 respondents to a university faculty/staff questionnaire (a 41 percent response rate), 135 already owned personal computers and 331 planned to buy one in the next five years. However, 60 percent reported already using a terminal or word processor at work, although most (70 percent) used it no more than two hours per day. The most

salient finding of the study was that, contrary to expectations that financial management and data base access would be the primary reasons respondents bought small computers, text processing was by far the most common application, with more than three times (mean of eight hours per week) the number of hours used for the next most popular function, entertainment. This predominance held across a variety of subgroups. Projected uses by 324 potential adopters put word processing first in number of mentions (29 percent of all responses, 53 percent of cases) and entertainment fourth.

An in-depth diffusion study of the adoption of personal computers (Rogers et al., 1982) found similar results. The top two reasons for purchase of a personal computer were "convenience of working at home" and "word processing," although Rogers et al. found that the machines were used most for games, and next most for word processing.

Other relevant results from the Rogers et al. study are as follows: (a) The entertainment functions led to greater observability of the innovation, particularly in owners' communicating evaluations to potential adopters; (b) potential adoption was associated with considerable pre- and post-implementation communication networking; (c) in line with Olshavasky's (1980) proposition, there appeared to be a rapid rise in the rate at which certain variables influenced adoption over time; and (d) 40 percent of the owners reported decreases (averaging 1.5 hours per day) in their television viewing.

Clearly, university faculty are early adopters (as only 2 percent of all U.S. households are estimated to own personal computers now). Most universities, as organizations, appear totally unprepared for this rapid invasion of personal word processing and computing. Without adequate planning, and with continued ignorance of such diffusion, these organizations will be unable to cope with multiple incompatible systems. More crucially, their organizational culture, information flows, status relationships, and support personnel will be challenged to change and accept this particular communication medium.

As an indication of the rapid diffusion of *word processing*, projections call for 40 percent to 50 percent of the U.S. information work force to have electronic work stations by 1990, or about 32 to 38 million work stations, compared to 11 percent and 5.5 million in 1980. A total of 400,000 word processing units are expected to be delivered in 1984 (IDC, 1980). A current study of organizational word processing adoption (Johnson, 1982) seeks to understand how organizational philosophies and work procedures affect the reinvention, or adaptation of the initial innovation, of word processing (Rice, Johnson, & Rogers, 1982; Rice & Rogers, 1980). Word processing brings computing to the least specialized of office workers, and involves computer-based communication technology in the most fundamental functions of organization work.

Johnson (1982) studied decision makers at two levels: the organizational level, where planners design formal roles and tasks, and the work-group level, where operators and users work out procedural routines and informa-

tional roles. Telephone interviews with representatives of over 200 organizations were followed by over 60 in-depth site visits, where from 4 to 10 persons were interviewed.

We can relay only some early, tentative results. No adopter wanted (or could even imagine) returning to manual typing, and efficiency in repetitive typing is the major benefit to date. However, increased organizational capability and effectiveness were rare, but much more likely in organizations where implementation follows principles of sociotechnical systems. The sociotechnical systems approach has been developed as a way of fitting technical and social systems to one another in organizations (see Pasmore & Sherwood, 1978). Not surprisingly, increased quality of work life is related to increased text processing capability, but not necessarily to increased efficiency.

Medical information systems appear to be an anomaly in the context of new media adoption (Gordon & Fisher, 1975). On the one hand, there are new approaches to the provision of information services to the medical profession, such as the joint venture by the American Medical Association and General Telephone to offer an online access system for medical information, via institutional and individual nodes in a nationwide network (Roberts & Crawford, 1982). The AMA will represent the quality control of content—a crucial medical concern—while GTE will represent the control of transmission technology. The system will even offer electronic mail, perhaps leading to more rapid diffusion of research and practical knowledge.

However, in-house medical information systems seem to be meeting stiff resistance. In spite of the heavy costs of patient-related data communications (nearly 40 percent of hospital cost per patient data; Ricord, 1982), Brenner and Logan (1980) found that most studies show a lack of acceptance of computerized patient and medical record systems. Their "nondiffusion" review shows that medical information systems generally have favorable innovation attributes (except perhaps for complexity, compatibility, and reversibility; see Rogers, 1982), but that organizational and environmental elements prevent their diffusion. In particular, physician professional values, government intervention, and the public's image of physicians all ran contrary to how the system seemed to interact with the personal, organizational, and public aspects of adoption. For example, most physicians have a sense of professional autonomy; individualism rules in the profession, as most knowledge is understandardized and obtained by experience; and there is a fundamental humanism involved in the public perception of medicine. Users of a standardizing, "expert" system would threaten these concepts. Additionally, the traditional hierarchical control and political structures in hospitals would be threatened by a computerized information system. Finally, echoing our suggestion that new media organizations are blurring boundaries between kinds and owners of information, the rights to publicly generated medical information are being strongly disputed (Cummings, 1982).

Diffusion studies, in particular, indicate how adoption of new media technologies may become inextricably caught up in social and institutional structures. Public education and libraries, discussed next, constitute another example.

Uses by Other Public Institutions

How much can the public benefit from new media technologies as implemented by public institutions? In this section, we look briefly at television as a lost opportunity and small computers as a new one for our public schools. We conclude with a few notes on the potential of libraries as a new type of public communications center.

The well-known Chu and Schramm (1967) reviews of the educational uses of television provide the best background for the present brief discussion. We know from many studies that television can be an effective instructional tool. One problem, until the application of formative research techniques in the development of *Sesame Street*, was that educational programming was often just an attempt to replicate a live instructional situation.

The contributions of the Children's Television Workshop (see Lesser, 1974; Palmer, 1981) in strategies that capitalized on various unique qualities of the television medium to promote instruction reflect one particularly important generalization in the context of this chapter. This is that instead of the typical concern with the limitation of a communications technology, the stress was to capitalize on the strengths of that medium. As is now well known, this involved the use of colors, movement, sound, and all of the production and editing devices that television can use to capture a viewer's attention. In early descriptions of *Sesame Street*, it was often remarked that the producers were using the best of the techniques used for producing successful commercials to develop attention-getting programs for children. Later, the producers were to combine these production techniques with sound mathematical and science strategies for the development of their successful *Three, Two, One, Contact*.

The Freestyle project (Williams, LaRose, & Frost, 1981) is a more recent example, in which attempts were made not to compensate for, but to capitalize on the qualities of television for instructional purposes. The aim in Freestyle was to encourage preadolescent children (9-14) to reject sex-roles stereotyping when thinking about jobs and careers. One public communications strategy was to develop programs of content and production quality that would compete with commercial television (ironically, the conveyor of a wide variety of sex-role stereotypes). Although an ambitious national summative evaluation showed Freestyle to be quite successful in its immediate knowledge and attitudinal effects on children, as well as attractive to educators (Johnson & Ettema, 1982), it is virtually unknown by most schoolchildren. Our public schools lack an effective network for the distribution of educational television

materials. Dissemination has been mostly by the Public Broadcasting Service and by smaller ad hoc consortium networks or commercial program libraries.

Our lost opportunity with television as an educational tool has not been in a failure of the medium as much as in the inability to develop a dissemination system. This failure is prompted in part, also, by the natural differences between the dissemination characteristics of a mass broadcast technology and the schedules of the individual user-classrooms. Broadcast schedules and classroom schedules rarely coincide. This raises the questions of whether videotape and videocasette technologies will overcome the dissemination barriers. Chances are, unfortunately, that the inertia of 20 years of failure of classroom use of television will be very difficult to overcome.

Now another technology is pressing for adoption—the personal computer. Its rapid and highly visible adoption by certain segments of society may force adoption by schools whether they like it or not. Since the early 1960s, the computer has been an intriguing topic for educational research and demonstration projects. Numerous "computer-assisted instruction" projects established the worth of the computer as an educational technology. So, too, did the later development of the Plato system. Yet adoption of computers in educational institutions was, until recently, nearly nonexistent save where supported by outside funds as demonstration projects.

One admitted barrier to adoption of educational computing for many years has been the major expense and administrative commitment required. Even the distributed services ("timesharing") of large computer systems have been too expensive for most schools. But these restrictions have now been broken by the coming of the personal computer. What once may have cost $100,000 to obtain might now be had for $1,000.

Another development has been to free the computer from rigid concepts of "programmed" instruction. In the eyes of some (see especially Papert, 1980), we are turning the tables so that "the child teaches the computer." Along this line is the development of computer programs that present the "controls" of the computer in a form capable of operation by a preschool child. Using Papert's LOGO program, a child can literally invent shapes, structures, or operations for a computer to accomplish. In essence, LOGO is an intermediary between a highly complex technology and the creative, yet untrained, mind of a five-year old. Although the original LOGO was designed for operation on a large and expensive machine, it is now available for several of the more popular personal computers.

Other applications (Williams, 1983) of computers for instruction include:

(1) *Willing student:* Program the computer to solve problems (for example, to do long division) and you learn especially well how to solve them yourself in so doing.
(2) *Simulator:* Let the computer "model" a situation or set of actions for you. (How many different shapes can you construct with these five lines? What happens when you add oxygen to hydrogen?)
(3) *Grab bag:* The computer gives you images, numbers, letters, or anything you want to play with, "try out," or make something out of.
(4) *Game machine:* Just about any type of learning can be converted into games, even multiplayer ones.

Paisley and Chen (1982) suggest that a diverse new media environment for children is unfolding, including not only personal computers but videotex, teletext, and videogames.

Finally, in no area will the public consequence of computers be more profound than on the education of children. Small computers could literally replace paper and pencil as a child's chief tool. It is to be hoped that, unlike television, for which our research literature mainly focuses on the effects of sex and violence, we will take better advantage of our newest technology.

The public library represents one further, but brief, example of the public impact of the new technologies. Unfortunately, there has been little active association between communication researchers and those in the field of library or "information" research. There is the problem, too, that to most persons outside of the library field, the library suffers from an image as a "passive repository of books." Indeed, the modern potential for the library is quite the opposite.

One reason for optimism is that new media are increasing services within library institutions—this includes online public catalogs, regional cataloguing, and interlibrary systems, immense multitopic data bases, and support of pilot public media experiments (see Cherry, 1980, for an overview of television information services). These components can eventually be linked together into interlibrary communication networks, including library satellite superstations (Diebler, 1982; Lancaster, 1978; Simpson, 1981). A second reason is that due to shifts in governmental and public funding philosophies, libraries are beginning to be asked to provide more services to the public just when they are losing resources to do so. At the same time, they have lost some of their mandate as near-universal education has reduced the role of the library as a democratizing institution providing information for the nonelite (Bates, 1974). Libraries have a keen need to increase their efficiency and at the same time develop into public communication network nodes.

Because the television, home computer, telephone, cable, and even direct-broadcast satellite delivery systems are coalescing, libraries can soon put all of their information at the disposal of family members and businesses. Further, they may fill the social service gap with community information centers (Williams, 1982a). They are the logical place for information and retrieval clearinghouses or brokers, not only for consciously accessed information, but also for selectively disseminated "life information"—for use in social and educational processes and day-to-day knowledge (Bates, 1974).

Libraries may also offer specialized information services to particular publics, much as radio and cable stations can.

IMPLICATIONS AND PROPOSITIONS

Stepping back from specific instances of communication research on new media, we suggest five broad areas of research implications. Very briefly, these are as follows:

(1) There is a need to rethink the contexts or paradigms by which we often organize our research focus. At the outset, we mentioned the blurring lines between interpersonal and mass-mediated contexts. We must increasingly account for the coalescence of personal, organizational, and public contexts of human communication. We may need entirely new paradigms.

(2) We should consider research foci that accommodate the new interactive qualities of media—for example, designs involving convergent, processual, and probabilistic communication analyses. (Such foci are suggested in the works of Monge, Farace, & Eisenberg, 1982; Rogers & Kincaid, 1981; Rice, 1981; Capella, 1980; Hewes, Planalp, & Streibel, 1980.)

(3) There is a need to expand qualitative as well as experimental research designs into the social psychological consequences of the new media. Case studies such as that by Johnson (1982) on the adoption of word processing are as valuable as tightly controlled laboratory studies. Both are important areas of contribution by the communication social scientist, and both are facilitated by the contexts and data of new media use.

(4) In our attempts to improve on the human benefits to be gained from new media, we should concentrate on the unique strengths of each medium rather than "compensate" or "substitute" for more natural media linkages. This requires research-based insights into these unique strengths and the broader subjective question of user satisfaction as well as "media styles."

(5) We can capitalize on the capabilities of certain new media to self-generate measures for research. Any technology involving computer mediation of messages can also count and classify exchanges. Questionnaires can be "built into" new technologies and systems. Ultimately, the design and implementation of any new system should have elements incorporated that facilitate further development and improvement through research. The advantages and disadvantages of these kinds of data, and the media that generate them, are discussed by Rice and Borgman (in press).

Our argument, then, is simple. The new media need to be included in traditional communication research, but we need to look at those traditional theories untraditionally. The new media are providing new arenas for communication research, new perspectives in traditional areas of communication research, and new questions for analysis and theory. The revolution in communication technology may, in fact, necessitate a revolution in communication research. Intellectual changes must occur to match the growing changes in communication behavior.

REFERENCES

Bair, J. Communication in the office of the future: Where the real payoff may be. *Business Communication Review*, 1979, *9*(1), 3-11.

Bates, M. Speculations on the sociocultural context of public information provision in the seventies and beyond. In C. Cuadra (Ed.), *Library and information service needs of the nation*. Washington, DC: Government Printing Office, 1974.

Bell, D. *The coming of post-industrial society*. New York: Basic Books, 1976.

Berger, C., & Roloff, M. Social cognition, self-awareness and interpersonal communication. In B. Dervin & M. Voigt (Eds.), *Progress in communication sciences* (Vol. 2). Norwood, NJ: Ablex, 1980.

Bernard, H., Killworth, P., & Sailer, L. Informant accuracy in social network data IV. *Social Networks*, 1980, *2*, 191-218.

Blumler, J. and Katz, E. (Eds.). *The uses of mass communication*. Beverly Hills, CA: Sage, 1974.

Brenner, D., & Logan, R. Some considerations in the diffusion of medical technologies: Medical information systems. In D. Nimmo (Ed.), *Communication yearbook 4*. New Brunswick, NJ: Transaction, 1980.

Capella, J. Talk and silence sequences in informal conversations II. *Human Communication Research*, 1980, *6*(2), 130-145.

Case, D., & Daley, H. *Personal computers: The new academic medium*. Paper presented at the meeting of the International Communication Association, Dallas, 1983.

Cherry, S. Telereference: The new TV information systems. *American Libraries*, 1980, *11*(2), 94-110.

Chu, G. C., & Schramm, W. *Learning from television*. Stanford, CA: Institute for Communication Research, 1967.

Comstock, G., Chaffee, S., Katzman, N., McCombs, M., & Roberts, D. *Television and human behavior*. New York: Columbia University Press, 1978.

Cummings, M. Medical information services: For public good or private profit? *Information Society: An International Journal*, 1982, *1*(3), 249-260.

Dervin, B. Mass communicating: Changing conceptions of the audience. In R. Rice & W. Paisley (Eds.), *Public communication campaigns*. Beverly Hills, CA: Sage, 1981.

Diebler, M. The library superstation: A library guide to satellite earth stations. *Information Technology and Libraries*, 1982, *1*, 231-237.

Dordick, H. Measuring the information society. *Journal of Communication*, in press.

Downs, C., & Hain, T. Productivity and communication. In M. Burgoon (Ed.), *Communication yearbook 5*. New Brunswick, NJ: Transaction, 1982.

Drucker, P. *The age of discontinuity*. New York: Harper & Row, 1969.

Ettema, J., and Kline, F. Deficits, differences and ceilings: Contingent conditions for understanding the knowledge gap. *Communication Research*, April 1977, pp. 179-202.

Feldman, M., & March, J. Information in organizations as signal and symbol. *Administrative Science Quarterly*, 1981, *26*, 171-186.

Fombrun, C., & Astley, W. The telecommunications community: An institutional overview. *Journal of Communication*, 1982, *32*(4), 56-68.

Gordon, G., & Fisher, G. (Eds.). *The diffusion of medical technology*. Cambridge, MA: Ballinger, 1975.

Hewes, D., Planalp, S., & Streibel, M. Analyzing social interaction: Some excruciating models and exhilarating results. In D. Nimmo (Ed.), *Communication yearbook 4*. New Brunswick, NJ: Transaction, 1980.

Hiemstra, G. Teleconferencing, concern for face, and organizational culture. In M. Burgoon (Ed.), *Communication yearbook 6*. Beverly Hills, CA: Sage, 1982.

Hiltz, S. R. *Online research communities: A case study of the office of the future*. Norwood, NJ: Ablex, 1982.

Hiltz, S. R. Personal communication—working papers, 1983.

Hiltz, S. R., & Turoff, M. *The network nation: Human communication via computer*. Reading, MA. Addison-Wesley, 1978.

Hirsch, P. Occupational, organizational, and institutional models in mass media research. In P. Hirsch et al. (Eds.), *Strategies for communication research*. Beverly Hills, CA: Sage, 1977.
International Data Corporation (IDC). Business communications: Alternatives for the eighties. *Fortune*, February 25, 1980, pp. 25-46.
Ito, Y. The Johaka Shakai approach to the study of communication in Japan. In G. C. Wilhoit & H. Bock (Eds.), *Mass communication review yearbook* (Vol. 2). Beverly Hills, CA: Sage, 1981.
Johansen, R., Vallee, J., & Spangler, K. *Electronic meetings: Technical alternatives and social choices*. Reading, MA: Addison-Wesley, 1979.
Johnson, B. *Innovation and word processing: Final report* (National Science Foundation Grant ISI 810791). Washington, DC: Government Printing Office, 1982.
Johnson, J., & Ettema, J. *Lessons from Freestyle: Creating prosocial television for children*. Beverly Hills, CA: Sage, 1982.
Katz, E., Gurevitch, M., & Haas, H. On the uses of the mass media for important things. *American Sociological Review*, 1973, *38*, 164-181.
Keen, P. Information systems and organizational change. *Communications of the ACM*, 1981, *24* (1), 24-33.
Kerr, E., & Hiltz, S. R. *Computer-mediated communication systems*. New York: Academic, 1982.
Kiesler, S., Siegel, J., & McGuire, T. Does it matter if you're not all there? In *Social psychology of computer-mediated groups*. Pittsburgh: Carnegie-Mellon University, 1982.
Lancaster, F. *Toward paperless information systems*. New York: Academic, 1978.
Lesser, G. S. *Children and television: Lessons from Sesame Street*. New York: Random House, 1974.
Lowenstein, R. *Office systems studies: Rationale, techniques and study*. White Plains, NY: IBM Data Processing Division, Enterprise Administration Systems, 1978.
McCombs, M., & Shaw, D. *The emergence of political issues: The agenda-setting function of the press*. St. Paul, MN: West, 1977.
Machlup, F. *The production and distribution of knowledge in the United States*. Princeton NJ: Princeton University Press, 1962.
Mendelsohn, H. *Mass entertainment*. New Haven, CT: College and University Press, 1966.
Mendelsohn, H. Some policy implications of the uses and gratifications paradigm. In J. Blumler & E. Katz (Eds.), *The uses of mass communications: Current perspectives on gratification research*. Beverly Hills, CA: Sage, 1974.
Miller, G. R. (Ed.) *Explorations in interpersonal communication*. Beverly Hills, CA: Sage, 1976.
Miller, G R. The current status of theory and research in interpersonal communication. *Human Communication Research*, 1978, *14*, 164-178.
Miller, G. R., & Steinberg, M. *Between people: A new analysis of interpersonal communication*. Chicago: SRA, 1975.
Monge, P., Farace, R., & Eisenberg, E. *The process of studying process*. Paper presented at the meeting of the International Communication Association, Boston, 1982.
Muson, H. Getting the phone's number. *Psychology Today*, April 1982, pp. 42-49.
Nisbett, R., & Ross, L. *Human inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice-Hall, 1980.
Olshavasky, R. Time and the rate of adoption of innovations. *Journal of Consumer Research*, 1980, *6*, 425-428.
Paisley, W. Information and work. In B. Dervin & M. Voigt (Eds.), *Progress in communication sciences* (Vol. 2). Norwood, NJ: Ablex, 1980.
Paisley, W., & Chen, M. *Children and computers*. Stanford, CA: Institute for Communication Research, Stanford University, 1982.
Pake, G. Personal communication, 1982.
Palmer, E. Shaping persuasive messages with formative research. In R. Rice & W. Paisley (Eds.), *Public communication campaigns*. Beverly Hills, CA: Sage, 1981.
Papert, S. *Mindstorms: Children, computers and powerful ideas*. New York: Basic Books, 1980.
Pasmore, W., & Sherwood, J. (Eds.). *Sociotechnical systems: A source book*. La Jolla, CA: University Associates, 1978.
Phillips, A. *Attitude correlates of selected media technologies: A pilot study*. Los Angeles: Annenberg School of Communications, 1982.
Pool, I. de S. (Ed.). *The social impacts of the telephone*. Cambridge: MIT Press, 1977.

Pool, I. de S. *Forecasting the telephone: A retrospective technology assessment*. Norwood, NJ: Ablex, 1982.
Porat, M. Communication policy in an information society. In G. Robinson (Ed.), *Communications for tomorrow: Policy perspectives for the 1980s*. New York: Praeger, 1978.
Rice, R. E. The impacts of computer-mediated organizational and interpersonal communication. In M. Williams (Ed.), *Annual review of information science and technology* (Vol. 15). White Plains, NY: Knowledge Industries, 1980. (a)
Rice, R. E. Computer conferencing. In B. Dervin & M. Voigt (Eds.), *Progress in communication sciences* (Vol. 2). Norwood, NJ: Ablex, 1980. (b)
Rice, R. E. Resources for longitudinal network analysis. *Connections*, 1981, *4* (2), 10-22.
Rice, R. E. Communication networking in computer-conferencing systems: A longitudinal study of group roles and system structure. In M. Burgoon (Ed.), *Communication yearbook 6*. Beverly Hills, CA: Sage, 1982.
Rice, R. E. *Media style and organizational use of computer-based communication systems*. Paper presented at the meeting of the International Communication Association, Dallas, 1983.
Rice, R. E., & Borgman, C. The use of computer-monitored data in information science and communication research. *Journal of the American Society for Information Science*, in press.
Rice, R. E., & Case, D. Electronic messaging in the university organization. *Journal of Communication*, in press.
Rice, R. E., Johnson, B., & Rogers, E. M. The introduction of new office technology. In *1982 office automation conference proceedings*. San Francisco: American Federation of Information Processing Societies, 1982.
Rice, R. E., & Paisley, W. The green thumb videotext project: Evaluation and policy implications. *Telecommunications Policy*, 1982, *6* (3), 223-236.
Rice, R. E., & Rogers, E. M. Re-invention in the innovation process. *Knowledge*, 1980, *1*, (4), 499-514.
Ricord, L. Computer assistance in hospital information systems. In A. Petrarca, C. Taylor, & R. Kohn (Eds.), *Information interaction: ASIS proceedings*. White Plains, NY: Knowledge Industries, 1982.
Roberts, D., & Bachen, C. Mass communication effects. *Annual Review of Psychology*, 1981, *32*, 307-356.
Roberts, S., & Crawford, S. American Medical Association medical electronic information network. In A. Petrarca, C. Taylor, & R. Kohn (Eds.), *Information interaction: ASIS proceedings*. White Plains, NY: Knowledge Industries, 1982.
Rogers, E. M. *Diffusion of innovations*. New York: Macmillan, 1982.
Rogers, E. M., Daley, H., & Wu, T. *The diffusion of home computers: An exploratory study*. Stanford, CA: Stanford University Institute for Communication Research, 1982.
Rogers, E. M., & Kincaid, L. *Communication networks: A new paradigm for research*. New York: Macmillan, 1981.
Schement, J., Lievrouw, L., & Dordick, H. Social factors influencing the emergence of an information-oriented society in California. *Telecommunications Policy*, in press.
Schiller, H. *Who knows? Information in the age of the Fortune 500*. Norwood, NJ: Ablex, 1982.
Short, J., Williams, E., & Christie, B. *The social psychology of telecommunications*. New York: John Wiley, 1976.
Simpson, D. The integrated library system of the future. *Resource Sharing and Library Network*, 1981, *1* (1), 45-52.
Smith, A. *Goodbye Gutenburg*. New York: Oxford University Press, 1980.
Stephenson, W. *The play theory of mass communication*. Chicago: University of Chicago Press, 1967.
Tannenbaum, P. (Ed.). *The entertainment function of television*. Hillsdale, NJ: Erlbaum, 1980.
Taylor, R. Value-added processes in the information life cycle. *Journal of the American Society for Information Science*, 1982, *33* (5), 341-346.
Turoff, M., & Hiltz, S. R. The electronic journal: A progress report. *Journal of the American Society for Information Science*, 1982, *33* (4), 195-202.
Uhlig, R., Farber, D., & Bair, J. *The office of the future: Communications and computers*. New York: North-Holland, 1979.
Wiio, O., Goldhaber, G., & Yates, M. Organizational communication research: Time for reflec-

tion? In D. Nimmo (Ed.), *Communication yearbook 4*. New Brunswick, NJ: Transaction, 1980.
Williams, F. The library and the communications revolution. *Wilson Library Bulletin*, September 1982, pp. 39-43. (a)
Williams, F. Doing the traditional nontraditionally. In H. F. Didsbury, Jr., (Ed.) *Communications and the future*. Bethesda, MD: World Future Society, 1982. (b)
Williams, F. *The communications revolution*. New York: New American Library, 1983.
Williams, F., & Dordick, H. *Managing the new information technologies*. New York: John Wiley, in press.
Williams, F., Larose, R., & Frost, F. *Children, television and sex-role stereotyping*. New York: Praeger, 1981.
Williams, F., Phillips, A., & Lum, P. *Some extensions of uses and gratifications research*. Los Angeles: Annenberg School of Communications, 1982.

8 ● When Cancer Patients Fail to Get Well: Flaws in Health Communication

SUSAN H. EVANS ● PETER CLARKE

University of Southern California

ONE out of three persons stricken with cancer today will survive at least five years. Twenty years ago the figure was one out of five. Survival rates for most major forms of cancer have climbed even more dramatically in the past decade. In ironic contradiction to this hopeful news, however, a grim fact must be recognized. Large numbers of people diagnosed with cancer refuse to comply with therapeutic regimens, or their compliance is so spotty as to render treatment largely ineffective, especially troubling because much of the improvement in survival rates is due to the use of more effective drugs.

This tragedy can be vividly demonstrated in an area of illness where survival rates are especially promising. Hematologic malignancies (for example, Hodgkins, leukemia, multiple myeloma, lymphoma) are often treated by an outpatient program of chemotherapy. Survival for three years or more can be expected with most new patients. A retrospective record review, conducted on patients who entered the Hematologic-Malignancy Unit at Los Angeles County-USC Hospital during 1978 and 1979, shows that only 25 percent could be considered active cases. In all, 20 percent of patients refuse treatment; the reasons and level of compliance prior to refusal are unknown. An additional 15 percent of the patients moved. This group included a covert form of refusal; many were Hispanics who believed that cancer was untreatable and wanted to go home to die. The remaining 40 percent had died, and we have no information on their compliance with treatment.

AUTHORS' NOTE: The authors gratefully acknowledge the diligent and helpful efforts of Gary Drews, and a thoughtful reading by John Ruchinskas.

Correspondence and requests for reprints: Susan H. Evans, Annenberg School of Communications, University of Southern California, University Park, Los Angeles, CA 90089-0281.