INTERACTIVITY AND COMMUNICATION RESEARCH

Emerging from the dominating, fierce (but somewhat unavailing) debate over the viability and morality of mechanical intelligence (Dreyfus, 1981; Nickerson, 1986; Weizenbaum, 1976) is a search for other qualities-of-interest of computers and the new technologies-based communication processes. Interactivity seems to be one of these qualities.

While the early days of research on new communication technologies were characterized more by the juxtaposition of unabashed awe and uncritical rejection of technologies than by thoughtful or rigorous research (Rogers & Chaffee, 1983; and others), current research on communication technologies in general (and computers as media in particular) is resulting in clarification of the appropriate foci of this research (Rice et al., 1984; Rogers, 1986; Steinfield, 1986).

The study of interactivity is part of the evolution in the ontology and epistemology of new communication technologies in general, and computers as media in particular. This evolution can be characterized as movement along three axes: (a) scope of interest typifying research, (b) the "user" or communication-process-participant upon whom research focuses, and (c) the disciplinary location of the phenomenon studied.

The study of new communication arrangements, including that of new media, their use, and their audiences, is maturing from a relatively unrefined state to a more focused enterprise. Such an evolution occurs for the subjects of interest ("what" is studied), the typical people under scrutiny ("who" is examined), and the constructs made salient by the analysis (the "wherefores" of research). Table 4.1 describes what I think the progression along the three relevant dimensions ought to be.

The interactivity construct addresses the progressive whats, whos, and wherefores of the right-hand side of Table 4.1. In fulfilling these requirements, interactivity is like a few other areas of interest in the new communication technology literature (the temporal orientation of media, degrees of control over communication flow, task versus socioemotional bias of a medium, information-seeking properties of media use) and unlike others (software evaluation, project evaluation, diffusion rates, and so on) (Rafaeli, 1985a; Rogers & Rafaeli, 1985). By all accounts and definitions, interactivity is a modifiable property: despite possible disagreements over what kind of property, and whose. The way in which interactivity affects casual, ongoing media use is at

TABLE 4.1
Trends in the Study of New Communication Technologies

From the Study of . . .		*To the Study of . . .*
What	complete interventions	modifiable properties (variables)
Who	experienced and extensive users, expert consumers, innovators	casual, average users, normal audiences
Wherefore	technologies' various and sundry qualities: complexity, consistency, conciseness, cost, and so on	qualities directly related to communication

least as interesting as its impact on heavy or novice users. And last but not least, interactivity is quintessentially a communication concept. In these terms, it becomes clear why interactivity is not just an interesting topic—its time has come for communication research. Interactivity is a special intellectual niche reserved for communication scholars.

EXPLICATION OF THE CONCEPT

Social interaction, and hence interactivity, is much like the geometric spiral metaphor for communication: Everyone is familiar with it. It has to be (at least) a good metaphor for something. And it is hard to describe without hand waving. Dance's classic Helical Model of Communication (Dance, 1967)—a spiral if ever I saw one—is an illustration of such a model. Dance is one of the first who attempted formally to express the interactive nature of communication. His helical model intends to illustrate that human communication is both circular and progressive. Communication, Dance (1967, p. 297) claims, continuously turns "back upon itself . . . affected by its own past conformations." Is interactivity simply another name for Dance's helix?

Unlike spirals and helices, the search here is for something beyond an illustrative metaphor. The purpose in explicating interactivity as a variable is in forging a metric against which communication and media arrangements could be aligned and compared. One cannot, therefore, accept Dance's implication that all communication is helical. In this discussion, the search is for the way to check whether, and how much, it

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is. Then we can ask: What are the consequences of communication straying away from helical or interactive form?

The broadest context for this question is in sociological theory about interaction. Social interaction is not a novel interest of research (e.g., Parsons, 1968). Several decades of social science scholarship were devoted to the analysis of individual behavior in groups, in particular with relation to interaction. Among those who have done seminal work in this area are Bales (1950), Hall (1966), Simon (1952), Goffman (1967), and the symbolic interactionist movement as a whole.

Bales's interaction process analysis is one of the first, and still a widely used paradigm for studying groups of people engaged in communicating. In Bales's categories, there is a detailed analysis of dimensions of behavior in face-to-face interactions. The physical dimensions of the interaction space were investigated by Hall (1966) and his students. In the cases of both Hall's interaction zones theory, and Bales's interaction process analysis, however, interaction itself is treated as an act-by-act occurrence. Its existence is treated as a dichotomous phenomenon—either there or not.

Simon's "formal theory of interaction in social groups" is concerned with what he terms "the intensity of interactions." Simon was one of the first to consider both the possible variability and the temporal functions of interaction among people. His theme was echoed by the symbolic interactionists, who hold the distinction of placing interaction itself at center stage. Goffman's interaction ritual is a discourse on the differences between "social order" and "ritual" in governing and eliciting different patterns of "interchange," varying "sequences of acts." Furthermore, Goffman was the first to emphasize the major efforts individuals undertake to maintain the communication exchange, and to expect and elicit messages that will provide the best platforms for new messages. Goffman (1957, p. 50) refers to this form of interaction, the "reciprocally sustained involvement," as "this spark, not the more obvious kinds of love, that lights up the world."

Nevertheless, rarely did the early work on social interaction treat interactivity itself as an isolable, variable dimension. Furthermore, in this tradition, interaction subsumes communication, it is not a part or subdimension of it. Interaction was the subject of interest in much of this early work, not communication. Communication was viewed as one vehicle through which interaction is achieved. By these theories, people engage, as a matter of fact, in interactions. Exchange was what people were thought to do.

With *communication* as a primary focus of interest, however, interaction itself becomes a variable outcome. Exchange is no longer a given. With a focus on media and what is brought by innovations in technology to communication settings, our interest is directed at communication with varying levels of interaction.

RELATED CONCEPTS: CLOSE BUT NO CIGAR

The waters are muddied some by several related but not isomorphic concepts. New technologies are often and correctly typified as providing or allowing several novel dimensions to the communication process they serve. These dimensions should, however, be honestly identified and located. One of the constructs that appears often (perhaps incited by popular usage) is animism, or mistaken anthropomorphization. One may (and several do) analyze the use and fascination with computers as media by borrowing from the psychological terminology of animism. It is argued that some of the early public response to this technology, which seems to "behave like humans," is attributable to a fantasy with animistic forms.

Can interactivity be explained as the form and fantasy of animism alone? Occasionally, the fascination with humanlike machines is discussed in terms of magic and mysticism (Frazer, 1922; Mumford, 1934; Shneiderman, 1987; Turkle, 1984). In the domain of the communication role of technology, however, interactivity is not just external form or futile fantasy. Fascination with animistic machines is often the working of the spell of surprise. In fact, one definition of *animistic* is that which is capable of surprising. Interactivity, though, seems to have a longevity that goes beyond surprise and novelty.

Some of the dimensions that go beyond surprise and novelty, but still do not capture interactivity, include *bidirectionality, quick response, bandwidth, user control, amount of user activity, ratio of user to medium activity, feedback, transparency, social presence*, and *artificial intelligence*. Early treatment of interactivity in the literature slipped all too easily into the trap of mistaking interactivity as one of these. Without attempting a formal definition of each, it is possible to indicate the contributions and deficiencies of these first-order terms in capturing the essence of interactivity. Making the differentiation requires distinctions between passive and active, reactive and interactive, interaction

and friendliness. These distinctions are presented in the following.

Some of the above concepts date from the historical transition of computer technology and communication tools based on it from "batch" to "time-sharing." The movement away from batch processing introduced many of the qualities that made computers the media they have become. From the user's perspective, the transition to nonbatch systems allowed two-way flow of messages (bidirectionality), rapid exchange (quick-response), larger volume of transaction per time unit (bandwidth), and a vast increase in the combinatorial measure of the number of possible responses, the choice and variety made available to the user. These fruits of advances in technology could be viewed in the terms of sociological exchange theory as increases in simple reciprocity. A better symmetry is achieved for contributions of either side, and (ostensibly) parity in gratifications can be improved. This technical tit-for-tat reciprocity, however, does not have an obvious reflection on the social relations involved. Even taken together, the technological improvements should not be mistaken as providing or even regulating interactivity.

The essence in the distinction here is in the differences between *two-way communication, reaction,* and *interaction.* The mechanistic terms and ideas that stem from the invention of time-sharing technology all allow bidirectionality or greater reaction (time, quantity, ability), but not interaction (yet). Rather than defining interactivity in human terms, these technologically based explications do so in terms of the hardware. They fail to capture the user- and content-oriented qualities that are (at least an intuitive) part of the appeal of interactivity. The purpose here is not to belittle reaction. The movement toward bilateral communication and the increase in reactivity of media are important phenomena. They should not, however, be confused with interactivity. Interactivity is even further advanced.

Another quality of media that is related to and confused with interactivity is medium transparency. Transparency, the degree to which the user or interactant is aware of the presence of a mediating entity, could be understood as a gauge of the salience of the medium's intervention in the communication process. Transparency is a measure of a passive quality, however: it refers to an obtrusiveness that is noise in the communication exchange. Transparency thus communicates an inadequacy that is not under the communicators' control. Interactivity, on the other hand, is an active quality; it is incorporated purposively. In information theory terms, interactivity is all but noise; it relates to all the other components of the information transfer model—sender, receiver,

channel, and message. Interactivity is potential adequacy, but it is up to the communicators to realize it.

The "conversational ideal" has often been mentioned as a standard of comparison for media (see Avery & McCain, 1982; Schudson, 1978). The conversational ideal represents the notion that "better" media somehow emulate the way in which humans conduct face-to-face conversations. The conversational ideal is close kin to the human intelligence ideal in computer science, where, for example, Turing (1950), Licklider (1960, 1968), and Winograd (1979) popularized the "Turing test," "man-computer-symbiosis," and "convivial computing" terms, all of which refer to the ways in which the performance of the computer as a medium is judged against human-to-human interaction as an ideal type.

Holding human conversation as an ideal type is attractive but problematic. Defining *interactivity* as "conversationality" is both subjective and simplistic. The conversational ideal is not a reliable concept across judges, cultures, or time. Furthermore, even system designers have begun to realize the shortcomings of such a definition. The revisionist rejection of simplistic anthropomorphic imagery is shared by social scientists (Chaffee, 1972; Schudson, 1978) as well as system designers (McDaniel & Gong, 1982; Shneiderman, 1987).

Similarly, social presence has been mentioned by several scholars as a differentiating attribute between media (Lometti, Reeves, & Bybee, 1977; Phillips, 1982; Short, Williams, & Christie, 1976). Given its intuitive appeal, "social presence" is at once the most widely accepted and the most nebulous of ways to understand the illusive concept of interactivity. As used by Short, Williams, and Christie, for example, social presence is a compendium of impressions regarding warmth, sensitivity, sociability, familiarity, and privacy. Other than the first-order, technically rooted concepts mentioned above, there is no specification of how these qualities are achieved. More important, it remains unclear whether social presence is a quality of the medium, channel, content, participants, or communication experience (Heeter, 1985; Rice, 1983). The multidimensional attraction of the "social presence" construct is also its theoretical downfall.

CLASSIFICATORY EXPLICATIONS

In view of the difficulty in conceptualizing interactivity, a growing number of scholars are attempting explications that go beyond the

obvious while making the above-discussed distinctions. These contributions could be grouped under the title "classificatory explications." Noteworthy attempts at classifying media by their interactivity are by Lippman (1985), Durlak (1986), and Heeter (1985). Interest in tight definition of the concept is fueled by the commonly held intuition that interactivity indeed produces positive outcomes. Thus contributions to the explication of interactivity are made by designers as well as scholars. Practitioner classifications include Jarvis (1984) and Gayeski and Williams (1985).

The descriptive and self-contained classifications offered by practitioners and researchers share a multidimensional view of interactivity. Each incorporates a mix of some of the concepts mentioned above. But the product is classificatory (designating phenomena as interactive or not), not metric or measurement oriented. These nominal definitions have their uses, but they cannot offer much explanation, prediction, or testable propositions. They claim to tell us when interactivity is present or not, but they do not tell us what it is, and thus do not allow for a uniquely communication-oriented variable.

INTERACTIVITY BEYOND REACTIVITY: A RESPONSIVENESS MODEL

In my view, the most helpful definition for interactivity would be one predicated on the issue of responsiveness. The distinction called for is between interactive, quasi-interactive (reactive), and noninteractive communication sequences. Quasi- and fully interactive sequences differ clearly from noninteractive communication in requiring that sender and receiver roles be interchangeable with each subsequent message. The complete absence of interaction is marked by jolting, incoherent conversation (McLaughlin, 1984). Still, as should be clear by now, communication could occur with little or no interaction. It may lack coherence, but it is communication.

The distinction between quasi- and full interactivity hinges on the nature of the communication responses. Interactivity requires that communicants respond to each other. But the content of response may have one of two forms: regular response—reaction to previous messages—or response—which, itself, acknowledges prior responses. The conditions for full interactivity are fulfilled when later states in a message sequence depend on the reaction in earlier transactions, as well

as on the content exchanged. A situation or medium remains quasi-interactive when the latter type of response is absent (Bretz with Schmidbauer, 1983; Rafaeli, 1985a).

This definition of interactivity recognizes three pertinent levels: two-way (noninteractive) communication, reactive (or quasi-interactive) communication, and fully interactive communication. Two-way communication is present as soon as messages flow bilaterally. Reactive settings require, in addition, that later messages refer to (or cohere with) earlier ones. Full interactivity (*responsiveness*) differs from reaction in the incorporation of reference to the content, nature, form, or just the presence of earlier reference.

Consider a political press conference. Surely, the presiding politician is communicating. But unless questions are taken by the politician from the floor, the conference remains noninteractive. Allowing for questions alone (two-way communication) does not make the press conference interactive (e.g., rhetorical questions). The politician's answers to reporters' questions (if given) are (at least) reactive. Even follow-up questions (and answers), however, do not elevate the sequence of messages to a fully interactive level unless such later questions address the relation between previous answers and previous questions. A taste of the drama and compelling power of interactivity is evident by conjuring up some memorable interactive exchanges between members of the press and politicians. Successful politicians know this. How different the memorable occasions are from the relatively dull and seemingly more commonplace occurrences: noninteractive or reactive conferences.

The three levels are illustrated in Figure 4.1. In each of the three levels, person (P) and other (O) are engaged in communication. The messages (M) are numbered by temporal sequence (Mj). The creation of messages by person or other can be independent of history (noninteractive), or based on a previous message—signed as P(Mj) or O(Mj) reactive. Finally, fully interactive messages can be based on the way previous messages relate to even earlier messages—expressed as P(Mj/Mj-1) or O(Mj/Mj-1).

Several central premises may be derived from the modeled notation in Figure 4.1:

(1) First, not all communication is interactive, and even noninteractive communication may contain coherent responses.
(2) Second, we are made aware that interactivity is not a medium characteristic. Media and channels may set upper bounds, remove barriers, or

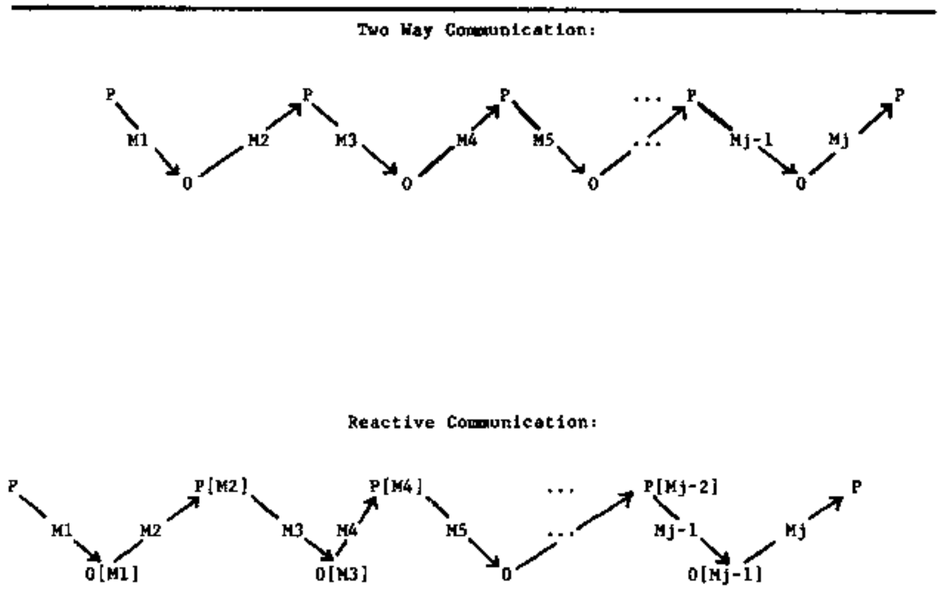

Figure 4.1 Interactive, Reactive, and Two-Way Communication

provide necessary conditions for interactivity levels. But potential does not compel actuality.

(3) Following from this is the overdue realization that much use of new communication technologies is noninteractive. Potential interactivity is a quality of the situation or setting.

(4) Last, this model distinguishes between interactivity and feedback, of which it is a subset. Interactivity is feedback that relates both to previous messages and to the way previous messages related to those preceding them.

An example may further illuminate the distinction between the three levels. Consider the exchange between a person and a vending machine:

(1) Sign on machine catches the person's attention. (2) Person inserts coin in machine. (3) Machine dispenses a candy bar. Is this an interactive situation? Are vending machines an interactive medium? Given the present definition of interactivity, the vending machine encounter, while clearly bidirectional, and perhaps even reactive to a very tasty degree, lacks qualifications for interactivity.

This explicit decomposition of communication sequences into these three types or levels of interactivity and the representation in Figure 4.1 create the backdrop for theorizing and hypothesis formulation regarding the effects and correlates of interactivity. It is hoped that this model makes it possible to classify situations as either interactive, reactive, or noninteractive. It also provides early indication of a continuity connecting these three levels. We shall turn to empirical research on interactivity, but first some words on interactivity as defined here and the discipline of communication research.

Communication research with this new definition of interactivity fits well within the rich social science tradition of studying interaction. The uses and gratifications approach could be shown to be a special case of symbolic interaction theory. Using similar logic, this model for interactivity merely extends the audience orientation that so widely characterizes mass communication research in recent decades. User becomes participant. Communication's dynamic nature is emphasized. Time is as much a variable as content and function. Contingency links are a required component in understanding the communication process.

In this sense, a focus on interactivity fits into the progress of communication research as a whole: The history of communication research can be (conveniently) oversimplified to the maxim that not all action produces reaction. The "magic bullet" is not as magical, nor does it penetrate as directly as expected. The uses and gratification approach, with its emphasis on an active audience, embodies this evolving differentiation between action and reaction. The added message here is that not all reaction is necessarily interaction.

Empirical work on interactivity as a variable or continuum centers on a related question: Is interaction as different from reaction as reaction is from action (that is, two-way but noninteractive communication)? The proverbial counterpart in a communication dyad does not always need to be counter, nor is her or his "part"—reaction or interaction—as obvious. Clear conceptualization brings forth not only a theoretical understanding of the concept, but also the realization that high levels of interactivity are an ideal type, not a description of reality. ("Ideal type"

is used here in the sense that settings can be judged against it, designs may be measured with it). Nor is it the case (as might mistakenly be construed) that the definition of interactivity is a normative prescription. This point was brought home vividly when attempts were made to emulate interactivity in empirical settings.

EMPIRICAL FINDINGS

Quite separate from conceptualization are the empirical issues. What does interactivity do? (Or why care about it?) Answers range from the obvious (or seemingly so), to the less obvious, and on to findings that may not seem intuitive at all. Results of research that operationalized approximations of the above explication—seeking correlates of increased interactivity—follow.

OBVIOUS

Acceptance and satisfaction are the most obvious set of effects of increased interactivity sought after and documented in the literature. Self-reported preference for media and other information systems was found to be affected by the role users have had in specifying, designing, or otherwise affecting the content or experience of using it. For example, Becker, Dunwoody, and Rafaeli (1983) examined public interest in the interactive potential of cable television; Nickerson (1986) treated the behavior of programmers and the tasks of programming computers; Tennyson (1981) reported preference for more participatory forms of computer assisted instruction; Schaffer and Hannafin (1986) studied the contribution of using video interactively; and numerous popular literature reports gave rise to the common use of the term *interactivity*. This finding is intuitive in communication research, although it is also the null hypothesis or finding in research done in the management information systems, information science, and decision support systems areas (see Olson & Ives, 1982).

LESS OBVIOUS

Interactivity effects go beyond the attitudinal. Several experimental settings using various media and arrangements identified less obvious

effects of increased interactivity. These include effects on performance quality, motivation, sense of fun, cognition, learning, normativity and extremism, and sociability as overt behavior of users.

Schaffer and Hannafin (1986) developed several versions of interactive video instruction materials. High school student subjects demonstrated greater recall of the material when exposed to the more interactive conditions (i.e., progressively: allowing questions, providing feedback, and branching the instruction). Tennyson (1981), Volans (1982), Watts, Baddeley, and Williams (1982), and others have been studying the use of computers to institute adaptive advising, and tailored and adaptive testing. These are communication situations usually carried out in reactive forms (like instruction and tests), changed here through computer administration to be at least potentially more interactive. Findings indicate that learning and mastery are favorably affected by the inclusion of interactive arrangements, even when the hardware technology is held constant. Subjects performed as well or better when provided with interactive information and control over computerized instruction and testing sessions. It should be pointed out, however, that interactivity may require added time, so that the rate of learning may actually be slower (Schaffer & Hannafin, 1986).

I (Rafaeli, 1986) administered public opinion questionnaires in three forms: paper and pencil, computerized, and computerized interactive. The interactive group received computer-generated prefaces for the latter two-thirds of the questions. The later questions were phrased with reference to responses given earlier. Mean opinion responses did not vary across experimental groups, but, as expected, results indicated that computerization itself as well as interactivity can lead to increased satisfaction and sense of efficacy. Interactivity alone, however, was responsible for responses that were at once lower on "social desirability" and more moderate. Thus the additional interactivity of the task seemed to engender thoughtfulness and care among the user audience.

Chaffee, Lieberman, and Rafaeli (1986) attempted to distinguish between effects of two types of interactivity. Using the same computerized questionnaire experimental paradigm, the interactivity manipulation was introduced as before, contrasted with solicited, respondent-generated "interaction" (responses to responses). Interactivity resulted in different outcomes depending on the source of backward references incorporated in the contingency that made the interaction. Subjects preferred "sought" interaction over "provided" interaction. The subjects preferred to be prompted for their reflections on how

things were going, rather than having the computer make such connections, or the condition of no such reflections.

Interaction itself is a well-documented human need. Media organizations and others are aware of this need and cater to it through a mechanism called para-social interaction: the provision of an illusion of interaction for their audiences (Beniger, 1987; Katz & Foulkes, 1962; Levy, 1979). The need and illusion of satisfying it are believed powerful enough to result in improved ratings for media channels.

Using survey data, I (Rafaeli, 1986) attempted to contrast para-social interaction with what I termed "ortho"-social interaction. Ortho-social interactions are the increasingly popular behaviors of calling talk shows, writing letters to the editor, and otherwise using traditional, unidirectional mass media in a new, reactive, or interactive manner. Both para-social and ortho-social interaction were found to be positively associated with media use (see section titled "Obvious," above). Para-social interaction was also shown, however, to contribute to a reciprocal substitution between media use and sociability, while ortho-social interaction contributed to a supplementation process. Ortho-social interactants with media (those who don't just imagine interaction) use the media to bolster their favorable disposition toward interacting with others.

LEAST OBVIOUS

Mindfulness emerges as one of the more promising, documented outcomes of some implementations of new media. Could increased mindfulness be a direct effect of interactivity? Papert (1980), O'Shea and Self (1983), Perkins (1985), and Salomon and Perkins (1986) represent many who have been concerned with the ways in which the use of interactive media allows faster and wider dissemination of educational fare, and the way the nature of using such media affects cognitive processes. Under various labels, they discuss the manner in which using such technologies broadens horizons or changes ways of thinking. Salomon and Perkins (1986, p. 4) term improvement in problem-solving abilities found among some young computer users the "high road transfer, resulting from mindful generalization." In identifying the causal agent for such mindful generalization, they refer to a vague "fingertip" quality of information-processing technology, a combination of the immediacy and control sensations afforded by such media.

I take issue with them in locating the source of the effect. Alternatively, an argument could be made for a theoretical linkage between the "high road" effects identified here, and the interactivity construct we are attempting to isolate. Neither causal inference is necessarily indicated by the data. But it may be that the recursive nature of interactivity may be eliciting responsibility through responsiveness as much as this is caused by the sense of control. The notion that self-referential communication encourages more cognitive processing is, at least, another appealing explanation for the same data.

More interactive conditions may also foster an atmosphere of increased cooperation. In a recent variation on the traditional Prisoner's Dilemma experiment (Rafaeli, 1987), the outcomes of a quasi-interactive strategy were compared to several noninteractive strategies. Subjects played two games of 30 iterations each of the two-person version of Prisoner's Dilemma. The "opponent"—a computer—was alternately identified as either computer or a computer-mediated human. Independently, the "opponent" played out one of four strategies. Only one of the opponent strategies was interactive (responsive to the subject's earlier moves.) The noninteractive strategies ("Naive," "Nasty," "Neutral") were all predetermined and nonresponsive to the subjects' actions. The "Naive" opponent cooperated in 90% of his moves. The "Nasty" opponent displayed competitive moves in 90% of his moves. The "Neutral" opponent cooperated in a randomly assigned 50% of turns. The quasi-interactive (or "Nice") opponent started his game cooperatively, and only changed strategies in defensive reaction to defections (switching toward competitive moves) of the subject.

Subjects (108 business administration students) were significantly more cooperative with interactive opponents than under any of the other conditions. Furthermore, the trend toward "defection"—decreased cooperation over time—was dramatically reversed in the interactive games. Cooperation was linked to the interactive manipulation above and beyond possible effects of perception of opponent (computer or human), subject's expertise with computers, order of exposure to stimuli (opponent strategies), and payoff considerations (Rafaeli, 1987).

The cooperative effect may just be an artifact of what could be called an extended Turing effect. The original "Turing test" was meant to identify intelligence in machines through subjective judgment of human observers (Turing, 1950). While this experiment may be evidence that the Turing test is too easy to satisfy, the point is that a form of

interactivity provides for this. A slight interactive manipulation (at the "cost" of very little cooperation on the part of the opponent) altered subjects' behavior.

While mindfulness and cooperation may be termed positive effects of interactivity, some empirical evidence suggests dangers and pitfalls related to interactivity. Any negative effects of interactivity are a surprise finding given the intuitive, cheerful expectations for across-the-board positive effects. These expectations were shared by some of the early researchers in this area in part because of their own fascination with the technologies involved. The recent demise of several commercial applications and the disappointingly slow diffusion of interactivity-providing innovations make for some market-based pessimism, which might be just as premature as the early optimism (Panko, 1983; Rice et al., 1984; Steinfield, 1986). Still, more interactivity is not only costly to set up, it may also prove to impede the communication process beyond acceptability.

The interactivity option involves a cost-benefit trade-off that both designer and user need evaluate. The first level of this trade-off refers to the up-front costs of interactivity. These include provisions for interactivity in the design of software and hardware for a communication system, and the obvious (but all too often overlooked) lengthening of the communication process itself. Stripped to information content and time measures, interactive communication can take longer and be cumbersome, if not clumsy, in comparison with traditional modes of communicating (Schaffer & Hannafin, 1986). Interactivity may also have second-tier costs associated with what transpires in the course of the interaction. Any mechanized or automated form of response to humans, varied and imaginative as it might be, could result in grating on nerves, offense being taken, or unwanted predictability. These second-level, negative impacts of interactivity and the ways they could be avoided seem likely targets for future communication research. How can interactivity arrangements be incorporated without falling into these traps?

THE NEXT ISSUES

Future work depends on the ability to further the interest in interactivity beyond episodic (and empirically driven) findings of effects

and correlates. Research on interactivity so far has been sporadic and unintegrated. Is a focus on interactivity too late or too early?

The answer to this question qualifies work on interactivity as either an exercise in the service of system design, or real social science engaged in monitoring the present environment and commenting on it. The interactivity construct does not seem to appear too early. There are good reasons to believe that interactive arrangements, technological and institutional, are already widely spread. Media organizations have been implementing call-in formats in radio and television programming. Market research data shows that these programs enjoy a considerable following. Audience participation in mediated communication takes on forms of letters to the editor in the printed media, as well as increasingly assertive "watchdog" organizations self- and otherwise appointed to monitor and attempt to affect mass media content (Rafaeli, 1985b). Part of the movement toward these forms of interactive mass mediation is, therefore, audience or user initiated. The diffusion of adoption and decline in videocassette technology cost are bringing about at least some alterations in the way people view television.

All these bits of evidence are anecdotal, however. Is there a historical trend, manifested in enduring market behavior, toward more interactive settings?

Or is interactivity late? If interactivity is as widely popular as claimed above, why has it escaped notice or consensus by mass communication researchers so far? The answer must be related, at least in part, to the curious temporal orientation of the concept. While purely psychological findings have traditionally focused on the short time span of seconds or minutes, social research is usually located at (and aimed toward) the locus of long terms: weeks, months, and years (see Newell & Card, 1985). Interactivity, like many other issues raised by new communication technologies, is a social, meta-, or cross-personal concept, with temporal qualities similar to those utilized most frequently by psychological research. It deals in seconds and minutes. As such, research on interactivity shares a dilemma that is typical of other areas in communication research. It is not surprising that here, too, arise the tensions between social-psychological and sociological approaches.

Several classes of issues should guide further investigation of the interactivity construct. In speculating about the future, and suggesting some focus for future work, I would focus on four types of interest: specification, theoretical, empirical, and pragmatic questions.

SPECIFICATION

A specification dilemma contrasts the appropriate criterion for comparison. What should be the fitting research contrast for interactivity? Can machine-fostered interactivity be judged in relation to human-to-human, face-to-face interaction, or should it rather be judged against other standards? Face-to-face-like, conversational communication is (mistakenly or not) used as an ideal-type model toward which some system designers strive. This is a fact, not necessarily to be acted upon by researchers in their choice of measuring sticks or evaluation criteria. Nevertheless, many students of computerized technologies are almost automatic in taking their cue from this standard (see Chapanis, 1975; Kerr & Hiltz, 1982; Kiesler, Siegel, & McGuire, 1984; Kiesler, Zubrow, Moses, & Geller, 1984), despite substantial differences in definition of the standard.

A focus on face-to-face communication as the standard of comparison is, at times, justified. The practice has humanitarian roots. It can be erroneous, however. In the real world, interactive arrangements may add conversationality to communication situations. That is their purpose. By their existence, they put more people in touch with each other, increase audiences for certain messages, and increase potential sources for certain areas of interest. If so, it would be a mistake to study them only in contradistinction to face-to-face alternatives. Such a strategy would mistake the limitations of yet-to-be-developed innovations for qualities of the construct. Second, if the secular trend is toward more interactivity, a face-to-face standard guiding research could miss the essence of development by diverting it toward a standard that is inappropriate and perhaps unnecessarily limiting.

Likewise, studying interactivity only in contrast to its absence may be rooted in latent Luddism. The face-to-face standard is appropriate when asking "what are we missing?" The question "where are we going?" is just as valid, however, and leads to research contrasting various interactivity levels using the same medium.

The theoretical futility of a competitive comparison between mass media and interpersonal communication has been argued rather convincingly in the past. Different channels are functionally complementary, not competitive. Chaffee (1972) has suggested replacing the juxtaposition of interpersonal and mass channels with an examination of the psychological and motivational aspects of media use associated with these channels. Schudson (1978) suggests that rather than finding

traditional media wanting in comparison to the "conversational ideal," we should realize how the media affect this ideal. The focus, therefore, should be on the functions of interactivity, not the horse race with face-to-face interaction.

MEASUREMENT ISSUES

Is it at all possible to measure interactivity, or are we destined to approach measurement via classification? This is related to the unidimensionality-versus-complexity issue discussed earlier. Much of the work on interactivity so far has been on classificatory, nominal, typological terms (e.g., Durlak, 1986; Gayeski & Williams, 1985; Heeter, 1985). On the other hand, much of the popular use of the concept is in variance (interval) terms. This is an interesting paradox, as it represents a reversal of the usual difference between popular and rigorous use of terminology. It is possible that interactivity is not a continuous variable, or at least not unidimensional. If so, the role of research is to expose its complexity, and decompose its components.

THEORETICAL ISSUES

An additional theoretical issue is the impact of the interactivity construct on the metaphorical images of media. Both the media themselves and the experience of exposure to mass communication have been likened to a window on the world. For example, Liebert, Sprafkin, and Davidson (1982) discuss television as the "early window" children use to learn about the world. Does the presence of interactive arrangements in some media turn this proverbial window into a reflective mirror? Through interactivity, the use of media may provide opportunities for introspection, not only inspection. Turkle (1984) alludes to the introspective nature of the interactive experience. What, exactly, is this introspective nature? Does its presence affect the reliability of traditional, surveillance use of media? Is there more here than the mindfulness effect discussed earlier?

Recently, observers of the field of communication research have been commenting on the growing affinity between research programs on interpersonal and mass mediated communication (Beniger, 1987; Schudson, 1978). This may be a backhanded manner of complimenting the field of communication research for arriving at a synthesis of what

Paisley (1971) would call levels. The interest in interactivity is related to this vanishing distinction in two ways:

(1) Work on interactivity may be seen to add a new member to the expanding family: mediated-but-not-mass communication. So far, research on these issues has been conducted mostly outside of the communication research community. The questions involved were deemed too pragmatic or applied. The theoretical angle of interest in non-mass, but mediated communication could be intensified via interactivity (see Ball-Rokeach & Reardon, this volume).

(2) Rather than dissolving what used to be distinct interest areas into a continuous body of research by adding finer, intermediate steps, interactivity adds a dimension that cuts across these various "levels." It provides a quality that is of intellectual interest as well as unrelated to the popular but banal dimension of audience size or number of participants. The interactivity concept offers a way out of the media/channel/source embroilment. A focus on what goes on, rather than who's to gain or blame, could be refreshing.

(3) Further, is the power of interactivity subjective or objective? In other words, and in the long run, do the results of interactivity relate more to perceptions of it, or to its presence itself? Can one manipulate the impression (rather than the fact) of interaction, and expect results that are as strong? What is the mediating power of expectations here? How much of interactivity is in the eye of the beholder? If interactivity is to be proven as having predictive power, an obvious next worry for research is the potential of "faking" interactivity. It is not yet clear whether interactivity stands in its own right. The issue of objectivity or subjectivity must be among the ethical issues raised by research on interactivity.

(4) Last, we should be asking the pragmatic question: What about interactivity and acceptance of innovations in communication arrangements, interactivity and novelty value (does it fade?), interactivity and utility, and interactivity and tenacity of use? In other words, What is the role of interactivity in the diffusion of media, maintenance of allegiance to channels, and the intervening impact of interactivity on use via attention? Much of the recent research on new communication technologies focuses on media choice (e.g., Steinfield & Fulk, in press).

These questions have rarely been asked, not to mention researched. The "optimistic" (but intuitive) view on this pragmatic issue is that interactive arrangements help overcome initial barriers. It is possible, claim the hopeful, that enjoyment emanating from interacting with

media will lay the foundation for the development of a real (or at least surrogate but satisfying) social relationship. Until appropriate data are collected, interactivity will continue to be viewed as an engaging, captivating process.

NOTE

1. Earlier discussions of interactivity and ideas leading to this chapter were presented in Rafaeli (1985a, 1985b, 1986), prepared for the Association for Educational and Communication Technology, April 1985, and the International Communication Association conference in May 1985.

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Chapter 5

MONOLOGUE, DIALOGUE, AND TELELOG
Comparing an Emergent Form of Communication with Traditional Forms

Sandra J. Ball-Rokeach and Kathleen Reardon

GIVEN THE RAPID AND continuing introduction of a wide variety of new communication technologies, many scholars have written about their potentials and effects. While these examinations are valuable, we think something more fundamental is at issue. Our aim in this chapter is to address the question of whether the emerging communication technologies represent (a) an extension of presently existing social forms of interpersonal communication or mass communication, or (b) a third social form of human communication.

We propose that the important focus in responding to this question is not new technologies per se but how they are transformed by societies for communication purposes. Technologies themselves do not constitute a social form or forms of communication. Their significance lies in what Beniger (1986a) describes as their capacity to extend "that which can be done." In short, it is not so much the formal characteristics of a technology that determine its significance to communication, but how it is used and whether it is used by people to, in some fashion, extend what they already do via other forms of communication.

We propose that sufficient evidence exists to warrant the conclusion that new communication technologies have extended what can be done

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