Interactivity, Concept of

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Interactivity is a relatively new, evolving, and still elusive concept in the study of communication, most frequently associated with new digital media technologies (→ Digital Media, History of). The concept's elusiveness may result from the common use of the term to identify a loosely defined bundle of attributes rather than a single attribute or phenomenon. At its core, interactivity refers to the phenomenon of mutual adaptation, usually between a communication medium such as the Internet or a video game and a human user of that medium.

A seminal, if somewhat *technical, definition* of interactivity was offered by Rafaeli (1988, 111): "Formally stated, interactivity is an expression of the extent that in a given series of communication exchanges, any third (or later) transmission (or message) is related to the degree to which previous exchanges referred to even earlier transmissions." The key element is *responsiveness* – what one says or does depends on another – a notion clearly rooted in human face-to-face conversation. However, given the rich possibilities of human–machine communication, Rafaeli warned that a model narrowly based on dyadic human conversation would be too simplistic and reductive. Interactivity, to Rafaeli, is a quintessential concept regarding the nature of communication.

In his original account of interactivity, Rafaeli considered the term "intuitively appealing but underdefined." Similarly, Jensen (1998) found it "frequently used but seldom understood" and "outrageously complex," while Sundar (2004) characterized it as "much touted but undertheorized." In a review of the literature, Bucy (2004, 373) concluded that "interactivity has been identified as a core concept of new media, yet despite nearly three decades of study and analysis, we scarcely know what interactivity is, let alone what it does, and have scant insight into the conditions in which interactive processes are likely to be consequential for members of a social system."

KEY CRITERIA OF INTERACTIVITY

From more than a dozen published typologies of interactivity, one can derive four common themes, even as terminologies vary. The first and perhaps most straightforward criterion is the *directionality* of communication. Throughout most of the late agricultural

and industrialized eras, mass communication was a distinctly one-way process with centralized and usually elite-dominated publishing and later broadcasting from the few to the many. Newspapers, for example, will publish occasional letters from readers, but the limited technology and large number of readers make feedback from audience to source extremely constrained (→ Newspaper, History of). Broadcast spectrum scarcity imposed even more severe constraints on the number of broadcasters through government licensing. Citizens' Band and amateur radio represented fascinating, but marginal, exceptions to the one-way flow (→ Radio: Social History). Advanced digital systems and the Internet changed these conditions fundamentally, as every audience member was empowered to send as well as receive data, text, audio, and video (→ Internet). The propensity for average users to download more than they upload generally is the result of individuals' limited cognitive and social resources, rather than an outcome of the technology itself.

The second criterion is *selectivity* – the breadth of choice that is available to the user in terms of both types and formats of information and entertainment. Selectivity depends on the quantity of material on offer, but also on the quality of its structure and, hence, the ease with which it can be accessed.

The third criterion is *responsiveness* – the rapidity with which and extent to which a medium responds to user input. Some analysts emphasize the speed of response, notably with video games. Others focus on the frequency or flexibility of an interaction, i.e., the interruptibility of a given stream of communication content.

The fourth criterion is *awareness*, defined as the degree of reciprocal awareness of system states and user reactions. As specified by Rafaeli (1988), later interactions of an exchange can reflect an awareness of earlier ones, as typified by human conversation. Heeter labeled this phenomenon self-monitoring (1989). Describing awareness as "actions and reactions with an understanding of context and meaning," van Dijk (1999) noted that such a genuinely reciprocal awareness on behalf of both user and system is still relatively rare at the current level of technology.

INTERACTIVITY, HUMAN INTERACTION, AND TEXTUAL INFORMATION

Most analysts acknowledge that the evolving interactive media are implicitly and often explicitly modeled on human social interaction. The *Turing test of machine intelligence* from 1950, for example, proposed to determine if a human conversing with a remote computer via a keyboard could determine whether the answering entity was another human being at a keyboard. If the questioner cannot determine this, the machine could be said to have passed the test of having "human intelligence." In the following decades, a variety of so-called chatterbot programs, notably Weizenbaum's Eliza program, proved successful in posing as human communicators (→ Avatars and Agents). Reeves and Nass (1996), more recently, documented experimentally people's propensity to assign human qualities to media technologies in the course of interaction (→ Media Equation Theory). And computer games now routinely permit players to select human traits such as strength, bravery, and agility in building identities for themselves as well as their on-screen allies or adversaries (→ Video Games).

Also, *one-directional mass communication*, for example, broadcast television, can produce an experience of interacting with other humans on-screen. In the phenomenon

of parasocial interaction, audience members may derive comfort and pleasure from the sense of having familiarity or even a personal relationship with fictional characters and media celebrities (→ Parasocial Interactions and Relationships). First identified in 1950s research, such mediated "intimacy at a distance" has remained a staple of communication studies.

Even the process of *reading traditional texts* might be understood as active human communication, paralleling human conversation and anticipating human–computer interactivity (→ Interactivity in Reception). Hermeneutic and semiotic traditions have drawn attention to the subtleties of interpretation and anticipation as a reader progresses through the elements of a narrative. Reading is not a one-way flow even if there is no explicit feedback loop from reader to author. The conception of interactivity as an entirely new phenomenon in computer media, thus, may reflect an incomplete understanding of how users interact dynamically with both old and new media.

TOWARD AN OPERATIONALIZATION OF INTERACTIVITY

Researchers have debated whether interactivity is best studied as a property of a media system or, instead, as a human user's psychological perception of the responsiveness of the medium. Bucy (2004), among others, made the case that interactivity should be conceptualized exclusively as a *perceptual variable*, arguing that the perceived reality of participating is more important than the technical reality of users' actual input or control: "Routinizing interactivity by designating it as a perceptual variable (albeit with social, behavioral and technological correlates) should encourage the concept's theoretical development by enabling empirical measurement through attitudinal and emotional scales and qualitative elaboration through focus groups research and open-ended questions, allowing systematic knowledge about interactivity to accumulate" (Bucy 2004, 377). Sundar (2004) and others, in contrast, have insisted that the perceptual variable approach is a tactical mistake. They argue that the vagaries of psychological perception and misperception will muddy the conceptual waters, and that it is at least necessary analytically to separate user inclinations and skills from the technical capacities of systems.

Perhaps in time communication research will acknowledge several components of interactivity in a multilayered model: (1) the technical affordance of interactivity (or components thereof), (2) the user's perception of an interactive potential, (3) the actual use of the affordance, and (4) behavioral outcomes resulting from either perception or use. The potential importance of examining these levels independently was suggested by a study that revealed, surprisingly, no correlation between the affordance and perception of interactivity (McMillan 2002).

THE DESIGN AND EFFECTS OF INTERACTIVITY

The literature on interactivity has been more utopian than dystopian, tending to celebrate the benefits of presumed higher levels of attention, engagement, learning, and satisfaction. In historical perspective, however, this might be akin to arguing that if there are more books in libraries, the populace will be better informed. The interactive affordances of new media systems may indeed contribute significantly to positive outcomes, but only under certain conditions of expectation and motivation, with appropriate designs, and

for certain types of users. Overly complex designs and overwhelming choice opportunities generally have proven frustrating. Some forms of narrative interactivity show themselves to be engaging and enjoyable to users with high cognitive capacities, but not to those with lower capacities (Vorderer et al. 2001).

Future research might even establish a curvilinear pattern identifying an optimum level of interactive affordances under specified conditions for specified types of users (Bucy 2004). In order to understand interactivity in practice, it is important to study the motivations of and constraints on information providers as well. In the socially important area of political communication, Stromer-Galley (2000) found that not only did the campaign staffs managing political candidates' websites have limited resources to respond to every query, but they also expressed significant ambivalence concerning how much information might be in the candidate's best interest to convey.

Increasingly, what was once a narrow technical sub-field of computer science – → human–computer interaction addressing the design of graphical and textual interfaces – has come to draw from and contribute to the understanding of human communication more broadly defined. The practical need to improve interface designs in new media provides problems, funding, and intellectual energy to the broader practice of communication research. It is widely recognized that a better general understanding of human attention, perception, and memory – as they affect, for instance, interactivity – is required for the field to progress (Nardi 1995).

SEE ALSO: ▶ Affective Disposition Theories ▶ Avatars and Agents ▶ Computer–User Interaction ▶ Digital Media, History of ▶ Human–Computer Interaction ▶ Information Seeking ▶ Interaction ▶ Interactivity in Reception ▶ Internet ▶ Media Equation Theory ▶ Newspaper, History of ▶ Parasocial Interactions and Relationships ▶ Radio: Social History ▶ Reciprocity and Compensation in Interaction ▶ Selective Exposure ▶ Symbolic Interaction ▶ Technologically Mediated Discourse ▶ Video Games

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