LESSONS LEARNED FROM EXPERIMENTS WITH INTERACTIVITY ON THE WEB

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ABSTRACT: This article reviews the empirical literature on interactivity, primarily studies based on experimental designs, and concludes that two conceptualizations of interactivity are beginning to dominate: the functional and the perceptual. Suggestions concerning future experiments with interactivity are offered.

As many have noted, there is little consistency in the communication research literature concerning the proper conceptualization of interactivity. This has led to the unfortunate situation of scholars sometimes reaching contradictory conclusions, not because their findings are necessarily at odds, but because the definitions of key terms are not the same. Although this is bound to occur with emerging concepts, advancement in theory is enhanced when communities of scholars reach consensus on conceptual building blocks (Shoemaker, Tankard, and Lasorsa 2004).

While a universal definition for interactivity has yet to be attained, there is, interestingly, some agreement among experimentalists on how to manipulate it, usually by varying the quantity and quality of channel features, most typically on the Web. This paper starts on this common ground, reviewing (primarily) the empirical literature, and then arguing that, while one study can push us only so far towards a workable definition, collectively the results of these studies help guide us in the proper direction.

Although the argument will take some time to advance, the conclusions are these: there are two important variants of interactivity, and these should be examined independently as well as in concert. A number of recommendations for interactivity research are offered in the final section as well.

Approaching Interactivity through an Examination of Structures

From the beginning, Web researchers focused attention on interactivity (Deighton 1996; Hoffman and Novak 1996; Rafaeli and Sudweeks 1997). A common approach involved an investigation of features of the new medium that made it different from traditional media. Initial empirical work focused on categorizing these features, often through content analyses. Ha and James (1998) proposed five dimensions of interactivity where each dimension was tied to a corresponding Web structure. Playfulness was indicated by the presence of games or FAQ sections on a site; choice by the customizability of the site (color, language, download speeds); connectedness by the use of hyperlinks; information collection by the presence of registration forms and hit counters; and reciprocal communication by the presence of e-mail links, phone numbers, chat sessions with site managers and order placement mechanisms.

Ghose and Dou (1998) listed 23 site characteristics and analyzed 101 corporate sites to find out which interactive features were the most prevalent and could best predict a high listing on a search engine. McMillan (1999) and Massey and Levy (1999) applied Heeter's (1989) dimensions of interactivity to analyses of websites using site features as indicators of interactivity. Bucy et al. (1999) coded online surveys, e-mail links, text links, graphic links, addresses, phone number and site counters as "interactive features" of dot-com websites. Aikat (2000) examined 264 Fortune 500 company websites for indicators of interactivity including dynamic content, interactive content, search features and intelligent agents.

Many early conceptualizations of interactivity were similarly "channel" driven. Some researchers followed Steuer's lead (1992). Steuer's important work categorized media by their ability to support telepresence, one dimension of which he labeled as interactivity. To define interactivity, Steuer referred to the "malleability of a medium's form and content" (p. 85). Other researchers have adopted this approach and defined interactivity as a "characteristic of a medium" (Choi, Miracle, and Biocca 2001; Lombard and Snyder-Duch 2001; Roehm and Haugtvedt 1999).

The Role of Users

But even while Steuer and others focused their attention on the characteristics of media, few argued that interactivity existed in technologies absent their use by people. Steuer's longer definition makes this apparent: "Interactivity is the

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extent to which users can participate in modifying the form and content of a mediated environment in real time" (p. 84). Similarly, Roehm and Haugtvedt noted that one aspect of interactivity is that it allows "consumers to participate in the formation of the content of the communication and its presentation" (1999, p. 32). Both Choi, Miracle, and Biocca (2001) and Lombard and Snyder-Duch (2001) added the phrase "in which a user can influence the form and/or content" to their categorization of interactivity as a facet of channel structure. Pavlou and Stewart (2000) went one step further and labeled interactivity a characteristic not of media but of consumers.

The interactive advertising model proposed by Rodgers and Thorson (2000) incorporates both the structural perspective and functional view, because, as they point out "structure alone cannot explain what drives individuals to enter cyberspace, and how they react to the physical features of Internet ads once the cyber journey has begun." People are the agents of interactivity.

Cho and Leckenby (1999) focused on the user in their definition of interactivity in advertising, "the degree to which a person actively engages in advertising processing by interacting with advertising messages and advertisers." The researchers noted two primary locations of interactivity: human-human interaction and human-message interaction. They proceeded to treat interactivity as both a dependent variable where individual characteristics served as antecedents and as an independent variable with consequences for attitude change and purchase intention.

Although, as the following section will explore, many experimental researchers use site features as a way to manipulate interactivity, most are not claiming that channel characteristics alone are interactivity. The question then is, what precisely are researchers manipulating when they build experiment websites with varying amounts of interactive features? A review of experimental research suggests that two dominant conceptualizations of interactivity are being employed.

Interactivity in Experimental Research

Multidisciplinary literature reviews have identified three primary conceptualizations of interactivity (Kiousis 2002; McMillan 2002). The first is the structural view discussed above. Although experimentalists have used web structures in their research designs, in most cases the conceptualizations offered center on the other two: process and perceptual.

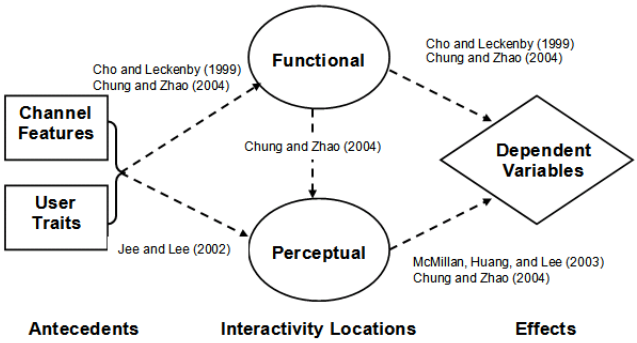
Interactivity as a Process of Message Exchange

Rafaeli (1988) is the most cited proponent of the interactivity-as-process point of view. He called it a variable quality of communication settings that referred to how reciprocal a particular exchange was. His conceptualization of interactivity was the first applied to Internet research. Ogan (1993) applied the work of Rafaeli and Ball-Rokeach and Reardon (1988) to an examination of postings to an electronic bulletin board. Specifically she examined messages for evidence of the "exchange, associational, and debate functions" identified by Ball-Rokeach and Reardon. All are communication, not technology, related concepts.

Heeter (1989), whose original six-dimension construct for interactivity is widely cited, has more recently proposed a participant-centered conceptualization (Heeter 2000). Under this view, the user's experiences with a particular technology define the concept, specifically: "actions the participant is capable of observing through one or more senses over whatever channels exist to connect the participant to the experience." Interactivity, here, is what occurs on the channels, not the channels themselves or their characteristics. The technology affords the interactivity but does not define interactivity.

Interactivity-as-process has been examined, although less frequently, by researchers using experimental designs. Cho and Leckenby (1999) used the participant perspective in a study on the effectiveness of banner ads. Study participants were exposed to the ads using a forced exposure manipulation. The most direct operationalization for the interactivity-as-process conceptualization would be direct measurement of user interactions with the text. Cho and Leckenby acknowledged this but used an indirect method because it was more practical: a self-reported measure of intention to interact. Interactivity measured in this way was causally related to favorable attitude toward the brand and intention to purchase. Figure 1 below shows how this study fits with other interactivity experiments.

Figure 1: A Model for Interactivity Research with Exemplar Studies



Cho and Leckenby (1999) conceptualized interactivity as a process, specifically the degree to which a person interacted with the ad. This conceptualization, and their operationalization, fit the functional view of interactivity. Although their operationalization is cognitive, it is not the same as a measure of the perception of interactivity.

A similarly constructed experiment was conducted by Macias (2003). She, too, proposed a process-oriented conceptualization: "interactivity is the state or process of communicating, exchanging, obtaining and/or modifying content and/or its form with or through a medium." Macias examined the role of interactivity on company websites on comprehension and persuasion regarding company products. Like the Cho and Leckenby (1999) study, participants were exposed to web structures that were either high or low in interactive potential. Similarly, participants' use of these features was not directly measured. Macias, however, employed a perceptual measure as a manipulation check. Study participants were asked how interactive they felt their website treatment to be. This measure varied in the manner anticipated by the manipulation of site structures.

Interactivity as a Perceptual Variable

Although Macias (2003) did use a perceptual measure as a manipulation check, some researchers have argued that interactivity is best conceived as a perceptual variable (Bucy 2004). Bucy argues that locating interactivity as a perceptual variable "routinizes the concept and makes it a part of everyday media experience," and further, encourages "the concept's theoretical development by enabling empirical measurement through attitudinal and emotional scales" (p. 377).

McMillan and Hwang (2002) noted that consumer perceptions are of central importance in advertising research so the perception-based approach to interactivity may be the most fruitful. They developed an 18-item scale for the measurement of perceived interactivity (MPI). This MPI scale was applied in a subsequent experiment to compare the effects of structural and perceptual interactivity (McMillan, Hwang, and Lee 2003). The researchers found some evidence that the perception of interactivity was more closely related to the dependent measure attitude toward the site than was structural interactivity. Results of this experiment also speak to the issue of functional, or process-related interactivity, and that aspect will be taken up in a subsequent section.

Jee and Lee (2002) used a nine-item scale adapted from Wu (2000) to measure perceived interactivity. They did something that relatively few have done: look not only at the effects of (perceived) interactivity but also at some of the causes (see Figure 1). They found that need for cognition and web skills were predictors of perceived interactivity. Further, they found that perceived interactivity was positively associated with attitude toward the site, which in turn was related to purchase intention.

Chung and Zhao (2004) also used an experimental design to examine perceived interactivity and also included an individual characteristic, motivation. The researchers found "a positive impact of perceived interactivity on both attitude and memory" concerning the ad, but the motivation manipulation had no significant consequence for perceived interactivity.

Testing Competing Interactivity Conceptualizations

Some initial conclusions can be drawn from the studies reviewed above. First, nearly every experiment concerning interactivity manipulates it by varying the amount and/or nature of interactive features available on websites or in banner ads. Second, although the manipulation of interactivity occurs in a similar fashion, differing conceptualizations are offered. Experimentalists are not proposing that interactivity is simply a characteristic of technology. Instead, all are concerned with human-message interaction and differ only in whether interactivity exists in the process of message exchange or in the minds of users. Third, there is often a mismatch between the conceptualization offered in a particular study and the operationalization used. Fourth, few studies have designed experiments that adequately measure both message exchange and perceived interactivity. The result can be lack of clarity in determining the causal mechanism responsible for changes in dependent variables (such as comprehension, attitude, and intention to purchase). A few studies have

explored this issue and these are examined in greater detail here.

Lee et al. (2004) compared what they called "objective" site characteristics with users' perceptions. Their findings shed light on the problem under examination in this paper. Study participants were asked to shop at three computer web stores which had been content analyzed by the researchers. They had coded each for the presence or absence of 88 interactive tools (Stout, Villegas, and Kim 2001). While the content analysis revealed no significant difference amongst the three on interactive features, study participants during in-depth interviews rated one site significantly more interactive than the others. The authors offer a number of possible explanations for the discrepancy, including the possibility that personal characteristics of users might be interacting with other site characteristics, or that some web features have more salience with the users than others.

Another possible explanation could be in how the sites were navigated by the users and which of the interactive features present were actually used. The sites could have roughly the same number of interactive features but their unique design may make it more or less likely that they were encountered (and used) by study participants. This possibility is one the strongest reasons for inclusion in experimental work of a detailed measure of actual use by each study participant. According to the functional view of interactivity, the mere presence or absence of certain features matters most if it affects how the messages are consumed.

A similar issue is raised in the experiment of McMillan, Huang, and Lee (2003). In that study, the authors concluded that "perceptual variables seem to be stronger predictors of [attitude toward the site] than structural variables" (p. 406). Involvement was also found to be closely related to perceived interactivity. But there was another finding that sheds light on the issue of interactivity conceptualizations. The researchers found that one of the sites with the fewest interactive features scored well with participants on attitude toward the site. The reason, according to the authors, may have been the presence of one particular web feature, a virtual tour. They surmise that study participants may have been much more likely to use it than other interactive features such as reservations forms available on some of the more interactive sites. Even though the site had few interactive elements, one of the ones it did contain may have been responsible for higher attitude toward the site scores. A measurement of actual site use by study participants might reveal the true causal mechanism.

The experiment by Chung and Zhao (2004) utilized measures of both functional and perceptual interactivity which makes it particularly relevant here (see Figure 1). The authors were first interested in the role of involvement on functional interactivity. They found that users with high product involvement were more interactive with product-related content than those with low involvement. Those with low product involvement also exhibited interactive behavior but with content not related to the product. In both cases, perceived interactivity (a five-item scale) was related to functional interactivity regardless of involvement. Further, the researchers found that perceived interactivity resulted not from the presence of certain structures, but from the interaction with them by users. This was measured by recording every click of a study participant's mouse. And perceived interactivity was positively associated with a post-test of product recall. Finally, the authors controlled for perceived interactivity and level of involvement and found that clicking behavior was still significantly related to product recall. This final result they attributed to the collinearity of perceived and functional interactivity.

These three studies highlight the importance of having separate measures for functional and perceptual interactivity. A perception of high interactivity can occur even when the structures necessary for it do not seem to be present (McMillan, Huang, and Lee 2003). Likewise, perception of interactivity can be low even when many interactive features are available if, for whatever reason, subjects are not using them. Because certain dependent variables (attitude toward site is one) can be influenced by both the perception of interactivity and by actual interaction with the content, causal mechanisms are best revealed by designs where each type of interactivity is measured.

Two Conclusions and Five Recommendations for Future Interactivity Research

The preceding analysis of interactivity literature, particularly in experimental research, reveals important trends. When it comes to conceptualizations of interactivity, most researchers are choosing between the functional view of interactivity and the perceptual view and are designing their studies accordingly. Regardless of which conception is picked, most are manipulating interactivity by varying the amount and nature of web structures. Conclusion one: Web structures are increasingly seen as antecedents or necessary conditions for interactivity but not as interactivity itself, leaving the other two

conceptualizations of interactivity as the dominant perspectives.

Some researchers offer a functional conceptualization of interactivity but for the purposes of a particular experiment, measure perceived interactivity instead. The opposite is also possible. In some cases, it's unclear which definition is operating. For example, when a researcher creates high and low interactivity conditions by varying web structures and then notes a significant effect on a dependent variable, we are often left wondering whether study participants actually exhibited differential interactive behavior (functional view) and this led to the effect, or if participants simply perceived one site to be more interactive (perceptual view) and that led to the effect. Of course, the evidence reviewed above suggests that each effect could be occurring. Conclusion Two: Functional interactivity and perceived interactivity are independent, although certainly related concepts.

Recommendations for Future Interactivity Research

Recommendation One: More experiments are needed that measure both functional interactivity and perceived interactivity. If functional interactivity and perceptual interactivity are unique concepts, it is important to determine how and when the two are causally related and how and when they are not. For a given dependent variable, it is also important to determine which of the two is really responsible for any association. Without careful measures for each, causation cannot be isolated, and that is one of the primary purposes of experimental design. Liu and Shrum (2002) had it right when they concluded, "one important explanation for the disparate results regarding interactivity effects can be traced directly to how the construct is defined and operationalized" (p. 63).

Recommendation Two: More experiments need to use non-forced exposure methods. Most of the experimental studies in advertising force exposure to treatments and then measure dependent variables via questionnaire. This is understandable as a starting point for the investigation of interactivity. But the true nature of a user's interactions with content may be changed by the requirement to view unwanted content. For example, a user may engage in heavy amounts of interactive behavior driven more by exploration than by interest in the "interactions" themselves. Depending on the dependent measures, causal relationships can be distorted.

Recommendation Three: More focus is needed on cognitive processing. What are users thinking when they engage in interactive behavior? Are they actively engaged with the content or is something else going on? Some research has been done in this area (Light and Wakeman 2001; Tremayne and Dunwoody 2001) but more is warranted. Tremayne and Dunwoody (2001) found that some clicking behavior that would otherwise be classified as functional interactivity was really an attempt at orientation by users. Light and Wakeman (2001) examined thought processes during the inputting of text by users, a higher order of interaction.

Recommendation Four: More focus is needed on user traits as antecedents. What causes a person to engage in interactive behavior when others avoid it? Some researchers have raised this issue (Chung and Zhao 2004; Heeter 2000; Jee and Lee 2002; Pavlou and Stewart 2000) but there is still more work to be done here. When it comes to interactivity, having the right web structures is important, but so is knowing your audience.

Recommendation Five: Expand the range of functional interactivity. Most of the interactive structures and interaction behaviors measured in interactivity research so far involve hypertext links. This is a rather narrow range of interactivity. There are many other types of interactive advertising (Faber, Lee, and Nan 2004). What happens when a user gets involved in a chat room or a discussion board at a company website? What happens when the consumer can customize a product to their preferences and view the finished product online? What happens when users have input in the ad campaigns chosen by corporations? The depth and complexity of user interaction with content and the consequences of this are areas of interactivity research that are largely unexplored.

Finally, whether researchers follow the functional or perceptual conceptualization of interactivity, the audience for the web is ever-changing. That means the expectations they bring to a particular episode of web use are ever-changing (Lievrouw 2004). For researchers and practitioners this means attempts to predict user behavior will always be a challenge.

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