

INTERACTIVITY AND PERSONALIZATION IN
PRODUCT PRESENTATION ON E-COMMERCE WEBSITES

A Thesis presented to the Faculty of the Graduate School
University of Missouri-Columbia

In Partial Fulfillment
Of the Requirements for the Degree
Master of Arts

by
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DECEMBER 2005

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INTERACTIVITY AND PERSONALIZATION IN
PRODUCT PRESENTATION ON E-COMMERCE WEBSITES

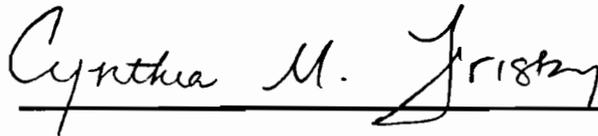
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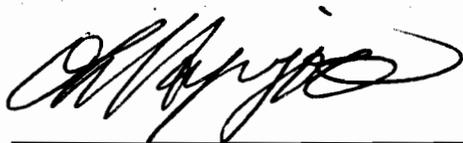
And hereby certify that in their opinion it is worthy of acceptance.

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DEDICATION

With Gratitude...

For my mother and father, who instilled in me confidence in my own ability – whose constant love and unwavering support have lifted me up so that I can reach my dreams.

And for Matt – whose love, pride, and care have given me the strength I need to persevere through setbacks and keep working to accomplish my goals.

To all those who have supported me – emotionally and academically – through friendship and counsel and celebration – Thank you. To finish this at all was difficult. To finish this alone would have approached impossible. I am forever grateful.

ACKNOWLEDGMENTS

Thanks to my committee, without whom this work would be impossible; and to the School who provided me with the resources to fuel my success.

Thesis Chair: Dr. Shelly Rodgers, Advertising

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Also, a special thanks to the University of Missouri PRIME Lab and its members, who provided me with support through an academic family, as well as the use of its resources.

I am particularly grateful to directors Kevin Wise, Paul Bolls, and Glenn Leshner – for your interest and counsel; and also to Lab Manager Becky Marxer – for everything, but especially for your friendship.

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CHAPTER 1: INTRODUCTION

The advent of the World Wide Web has created a marketing environment in which traditional brick-and-mortar stores are finding it highly advantageous to develop an e-commerce website. After adjusting for the holiday shopping season, a report from the U.S. Census Bureau on November 19, 2004, stated that e-commerce sales accounted for \$17.6 billion of economic activity in the third-quarter of 2004 – 1.9% of the total estimated \$916.5 billion (Lear-Olimpi, 2004). These estimated third-quarter sales were up 21.5% from the same time in 2003, contributing to total estimated quarterly sales of 6.2% for the year. By 2010, online sales are expected to contribute \$316 billion to total retail sales according to Forrester Research (Sullivan, 2004). In England, it has been estimated that out of the nearly 93% of national businesses which have developed a web presence, nearly 38% of these businesses participate in online sales – a percentage that continues to grow (“Profit”, 2004). This scenario is becoming a global trend. For Thailand, according to a survey by the National Electronics and Commerce Technology Center, the e-commerce market in 2003 was worth around \$7 billion, increasing by 4.5 times from 2002 (“Road to Success”, 2004).

As e-commerce sales continue to grow, it becomes important for businesses to realize what options are available to them to ensure online success. With the proliferation of e-commerce websites and online activity, it is easy to see why marketers are turning to forms of interactive advertising to garner the attention of the online crowd. A vital part of e-commerce is “product presentation,” which refers to the way in which a

corporation chooses to display its products for the shopper's inspection before purchase. While recognized as a form of interactive advertising, product presentation has not been studied extensively. Research that focuses on product presentation conceptualizes interactivity in terms of telepresence, or a simulated direct experience. Scholarly research has revealed that two media features shown to increase the effectiveness of interactive advertising are interactivity and personalization. This study will conceptualize interactivity in terms of the personalization of an interactive ad. This study explores how personalizing interactive advertising affects perceived interactivity, as well as consumer attitudes and behaviors.

Interactivity is a prevalent, yet not well-understood topic in today's media effects literature. Both researchers and practitioners of new media are interested in how components of interactivity affect consumer behavior in today's commercial environment. Although scholars have proposed many different conceptualizations of interactivity, most agree that interactivity is composed of some form of reciprocal communication and control. This study will provide an overview of conceptualizations in the interactivity literature that are relevant to the current study, and present the definition that will be used for this research. It will also examine whether the role of personalization improves the effectiveness of interactive advertising.

The proposed research will attempt to expand on the current literature by examining the effects of personalization on interactivity in product presentation, thereby combining arguably two of the most important concepts of interactive advertising. It is hoped that this study will not only contribute to the current literature, but also serve the practical purpose of informing e-commerce website design. Ultimately, the results of this

study may offer suggestions for increasing the effectiveness of product presentation on e-commerce websites.

CHAPTER 2: LITERATURE REVIEW

WHY STUDY INTERACTIVE ADVERTISING?

As mentioned previously, many businesses have realized the importance of creating a web presence to meet the needs of their Internet-savvy customers. While these websites can host a variety of web-based advertising, including banner ads, pop-up ads, buttons, hyperlinks, and sponsorships, recent advertising literature has conceptualized the actual website as an ad in and of itself (Rodgers & Thorson, 2001;). Singh and Dalal (1999) state that corporate websites “meet the conceptual definition of advertising, they resemble ads in physical appearance, and they perform the same basic functions – to inform and persuade”.

McMillan, Hwang, and Lee (2003) stated that the corporate website can “host direct-marketing activities that range from requesting a catalog to online purchase” (p.401). They argue that the transactional capability of a website, represented by product purchase on e-commerce websites, may be one of the most important characteristics of web advertising. However, they warn that engaging the consumer by facilitating transactions is a capability of the new medium that, if overlooked, can result in taking only partial advantage of the new medium (p. 401). This attitude has prompted further study of online shopping by other researchers who share interest in the advantages of this kind of interactive advertising (Ha and James, 1998; Li, Daugherty, & Biocca, 2002; Choi, Miracle, & Biocca, 2001; Liu & Shrum, 2002; Rodgers & Harris, 2003).

Rodgers and Thorson (2000) suggest that a website can be examined as both a form of, and a carrier of, interactive advertising. For example, a hyperlink is a form of interactive advertising commonly found on a website. One study has shown that increasing the number of hyperlinks on a website increases the perceived interactivity of the website (Sundar, Kalyanaraman, & Brown, 2003). Thus, a website as an advertisement may be only as interactive as its underlying components.

As stated previously, product presentation is an integral part of an e-commerce website's success. It serves the purpose of interactive advertising by dually informing and persuading the user. In a physical store, a product might be displayed on a manikin, or hang on a rack, organized by size, style, and/or color. On an e-commerce website, a product is presented in the form of a one-dimensional (1-D) flat image of the product; a two-dimensional (2-D) image of the product by itself or on a model; or a three-dimensional (3-D) image of the product which the shopper can rotate, zoom-in and zoom-out, animate features and functions, or even change the color or context of the product he/she is viewing (Li, Daugherty, & Biocca, 2002). This study proposes to examine product presentation as a form of interactive advertising.

INTERACTIVE ADVERTISING: INTERACTIVITY AND PERSONALIZATION

Interactive advertising can be described by a number of features which the advertiser controls, many of which are included from those features identified in traditional media (Rodgers & Thorson, 2000). Two key components of interactive advertising are *interactivity and personalization*. Rodgers and Thorson (2000) suggest that interactivity is the most significant feature of interactive advertising, because it is a

unique way for the user to participate in the persuasion process. Pavlou and Stewart (2000) discuss personalization in advertisements as a traditional concept (Stewart & Ward, 1994) that is potentially important in measuring interactive advertising effectiveness. By reviewing the literature, this study proposes that varying levels of personalization act on the level of perceived interactivity by affording the user more control over the communication experience. The concepts of interactivity and personalization will now be discussed.

DEFINING INTERACTIVITY

Seemingly, interactivity scholars can agree on only one thing: to disagree about the theoretical definitions of interactivity. Most scholars will consent to the idea that interactivity is a widely-discussed, multi-dimensional topic that has noteworthy consequences for communication in an online medium. Much of the literature has focused on explicating the concept by attempting to logically incorporate all possible dimensions of the term (Sundar, Kalyanaraman, Brown, 2003; Kioussis, 2002; Liu & Shrum, 2002; Bucy, 2004). Other scholars have spent time arguing the differences between types of interactivity (Stromer-Galley, 2004; Sundar, 2004). Due to this lack of agreement, choosing a definition for interactivity is no small task. However, most definitions can be summarized by two core concepts: reciprocal communication and control (Liu, 2003). Liu (2003) contends that both concepts are important for understanding interactivity; stating that control facilitates reciprocal communication, and reciprocal communication in turn provides an appropriate channel for exerting control (p. 208). Liu and Shrum (2002) describe the dimensions of active control and reciprocal

communication, as they attempted to create a satisfactory definition for the purposes of their own study.

Reciprocal communication refers to two-way communication, either between users, or between the user and the computer/software/website/etc (Liu & Shrum, 2002). Increasingly, businesses' marketing strategies have included the development of an online presence in the form of a corporate or e-commerce website (Ghose & Dou, 1998). This trend has prompted researchers interested in interactive advertising to focus on reciprocal communication between the user and the technological interface, particularly between users and websites (Coyle & Thorson, 2001; Chen & Wells, 1999; Ha & James, 1998; Liu, 2003; McMillan, Hwang, & Lee, 2003; Raney, Arpan, Pashupati, & Brill, 2003; Sundar, Kalyanaraman, & Brown, 2003). As discussed previously, one important advantage of a company website is the ability to facilitate an online transaction, a form of two-way communication (Liu & Shrum, 2002). Necessary transaction activities, such as product presentation, order placing, and payment, can all be done online, thereby enhancing the reciprocal communication between the user and the company (Liu & Shrum, 2002, p. 55).

Control refers to a user's ability to voluntarily participate in, and instrumentally influence a communication (Liu & Shrum, 2002; Liu, 2003). Liu and Shrum (2002) describe the Internet as a medium in which users can navigate a network of linked content (Hoffman and Novak, 1996), which has a parallel and nonlinear structure (p. 54). Users are able to customize their communication experience and the flow of information by jumping from one location to another on the network (Liu & Shrum, 2002). Control is also voluntary – the user acts according to his or her own goals and will (Liu & Shrum,

2002, p. 55). Wise and Reeves (2005) succinctly state that control, in terms of interactivity, is “user influence, user activity, and power over discourse” (p. 4).

In the context of the World Wide Web, which facilitates interactions between businesses and consumers, reciprocal communication and control can be seen through the example of an online transaction through an e-commerce website. An online shopping experience includes reciprocal communication in the form of purchase transactions and filling out forms, as well as basic navigation through a website (clicking on links, buttons, etc). Users can control which catalogs they would like to shop in, which products they would like to see, and can sometimes even control how they would like to view the product.

Effectively incorporating both dimensions of interactivity, Steuer (1992) emphasizes the importance of both user control and reciprocal communication as part of the mediated information exchange. Therefore, this study will define interactivity according to Steuer (1992) as “*the extent to which users can participate in modifying the form and content of a mediated environment in real-time.*” In the case of 3-D interactive product presentation, reciprocal communication and control occur when the user can participate in the shopping experience by rotating, zooming-in or out, or changing the color or context of a product.

PERSONALIZATION AS CONTROL

As new media channels are being continuously developed (most recently, the Internet), consumers are exposed to an ever-increasing bombardment of advertising messages (Fitzgerald, 1999). Consumers seem to be gaining a more significant understanding of these messages (Campbell, 2000); and, as such, it has become more

important for advertisers to attract attention to their ads in new and creative ways. Some advertising has attempted this with bigger, better, louder, more colorful, and more vibrant advertising. However, some scholars believe this approach will likely fail advertisers in the long-run, because consumers learn to ignore media messages (Ha, 1996; Elliot & Speck, 1998). Fitzgerald (1996) argues that the better approach is to provide a more customized and personalized advertising experience. The Internet, and other interactive technologies, makes it possible to create more personalized advertising for consumers. Thus, interactive advertising models are moving from non-personal ads controlled exclusively by the sponsor to personalized ads that are more interactive (Lombard & Snyder-Duch, 2001).

Personalization is the degree to which something is made for, directed, or adjusted to a particular individual (American Heritage Dictionary). Stewart and Ward (1994) state that personalization in advertising communication is not a new concept, as it has been traditionally discussed in terms of direct advertising and individual sales promotion (as cited by Pavlou & Stewart, 2000). Beniger (1987) discussed the impact of personalizing mass media in terms of building pseudo-communities, with more sincere, direct messages leading to more persuasive interpersonal communications. He argued that new technologies would bring about societal changes based on interpersonal relationships, and that mass media would have to adapt to these changes in order to remain persuasive (p. 368). Pavlou and Stewart (2000) also argue that the capabilities of advancing technology to transform mass messages into personalized messages will lead to a greater impact of personalization in interactive advertising.

Pavlou and Stewart (2000) state that personalized messages are the result of questions about consumers' personal preferences and interests. Specifically, the research states that "personalized advertising requires measures that ascertain what consumers want to know, what they want to buy, and how they wish to buy" (Pavlou & Stewart, 2000). Interactive advertising has the ability to deliver customized information and features to consumers to ensure that consumers receive relevant messages. This results in more focused messages that are less costly and will generate more desirable responses (Pavlou & Stewart, 2000).

If personalized messages require audience members to indicate personal preferences, then allowing audience members to communicate these preferences is one way in which advertisers can increase the control afforded to the audience. The consumer has less control over the communication/message/stimulus when he/she is not allowed to personalize, whether or not he/she takes advantage of the opportunity. *Thus, this study conceptualizes personalization as an integral part of control in interactive advertising.*

In addition to defining what interactivity is, scholars have also debated whether interactivity should be studied from an objective viewpoint (actual interactivity) or a subjective perception perspective (perceived interactivity) (Wu, 2005). While interactivity has traditionally been considered beneficial and desirable for communicators, recent academic research has begun to question this assumption because of the lack of consistency in research findings that have examined interactivity's effects on attitudes toward the website, attitudes toward the brand, and purchase intention (Wu, 2005; Liu & Shrum, 2002). In an analysis of the literature, Wu (2005) found that

inconsistencies were largely linked to whether the author used an objective or subjective perspective of interactivity. Therefore, it is important to outline why this study will focus primarily on the *perceived interactivity perspective*.

PERCEIVED VS. ACTUAL INTERACTIVITY

Actual interactivity has been defined as properties of a medium, or capabilities that allow the creation of an interactive content or messages (Wu, 2005; Hoffman & Novak, 1996; Steuer, 1992). Steuer (1992) argues that interactivity refers only to the representational powers of the technology (p. 81). This view of interactivity describes a *potential* for interaction with a medium (Rafaeli, 1988); and, therefore acknowledges that some mediums are more interactive than others (Wu, 2005). Traditional one-way media, such as radio and television, do not facilitate reciprocal communication or user control to the extent which new media, such as the Web, is able. Thus, traditional media is considered less interactive than new media (Wu, 2005). However, this does not account for the perceived control a user might experience, when he or she actually has very little control over the content or performing of the communication (Bucy, 2004, p. 376).

Realistically, actual interactivity can only provide the user with the potential for increased interaction because it is “up to the communicators to realize it” (Rafaeli, 1988, p. 117). In other words, an interactive medium is only as interactive to a user as the degree to which its level of interactivity is perceived. It highlights the psychological dimension of interactivity, acknowledging that audiences can perceive control when there is none or vice-versa (Bucy, 2004). Bucy (2004) cites a variety of communication literature that supports that mediums that are “*perceived* as interactive become so to the user” (p. 377). Reeves and Nass (1996), after summarizing three-dozen experiments

involving interactivity, concluded that “what *seems* to be true is often more influential than what is really true...*perceptions* are far more influential than reality” (as cited by Bucy, 2004). Also, Hoffman and Novak (1996, p. 64) comment on persuasion literature (e.g. Bandura, 1977; Azjen, 1988), stating that “a consumer’s perception of behavioral control...and its impact on intentions and actions is more important than real control” (p. 377).

Liu & Shrum (2002) acknowledge the benefit of the dual-acceptance of interactivity as both a functional and perceptual variable. They advise that it is wise to understand how functional variables can be manipulated to a certain degree, but that at a certain point, perceived interactivity takes over and is uncontrollable (p. 56). Even Steuer (1992), who studies interactivity as a property of the technology, acknowledges that the contribution of interactivity in creating an experience is relative and varies across individuals (p. 80). This implies that the concepts of interactivity as a property of technology and user perceptions work together to ensure the overall interactivity of the interactive advertisement.

Wu’s (2005) findings report a positive relationship between actual and perceived interactivity. The research showed that perceived interactivity is a mediating variable for actual interactivity – leading to positive attitudes toward the website. As a mediating variable, the presence of perceived interactivity reduced the significance of the actual interactivity in predicting attitudes toward the website, when the two were considered simultaneously. Based on these findings, and due to the nature of this study in examining attitudes and intentions, the interest in this research will focus on the user’s *perceived interactivity*.

When interactivity is defined as “*the extent to which users can participate in modifying the form and content of a mediated environment in real-time,*” increased levels of the components of interactivity, such as control, will lead to an increase in the actual interactivity of the mediated environment. However, based on Wu’s (2005) research findings that actual interactivity and perceived interactivity are positively related, increases in actual interactivity are expected to yield increases in perceived interactivity. In keeping with the suggestion in the literature review that personalization is a part of control, and that control is a key dimension of interactivity, this study suggests the following hypothesis:

H1: High (versus low) personalization will yield higher perceived interactivity.

In terms of product presentations on e-commerce websites, it is important to discover how personalizing the interface will affect perceived interactivity, because previous research has shown a link between levels of perceived interactivity and the ability to predict consumer attitudes and behavior intentions (McMillan, Hwang, & Lee, 2003).

ATTITUDES AND PURCHASE INTENTIONS

Measuring attitude toward a website is an important first step in studying the effectiveness of a website as an advertising tool (Rodgers & Thorson, 2000; McMillan, Hwang, & Lee, 2003). This importance lies, at least in part, in the fact that attitude toward the website is a predictor of attitude toward the brand and purchase intention (Jee

& Lee, 2002). MacKenzie, Lutz, and Belch (1986), as well as Shimp (1981), have created a framework for measuring attitude toward ads (A_{AD}) (as cited in McMillan, Hwang, and Lee, 2003). Chen and Wells (1999) adapted a new scale from A_{AD} , which instead measures attitude toward a website (A_{ST}). Since this adaptation, many studies have used A_{ST} to assess the effects of multiple variables on websites (Coyle & Thorson, 2001; McMillan, 2002; Jee & Lee, 2002; Raney, Arpan, Pahupati, & Brill, 2003).

A_{AD} , and by extension, A_{ST} , has its roots in Fishbein's (1967) theory of reasoned action, and has therefore shown strong relationships with purchase intention and brand loyalty (as cited in McMillan, Hwang, and Lee, 2003). Jee and Lee (2002) stated that if today's websites reflect characteristics of traditional ads, as Rodgers and Thorson (2000) suggest, then "attitudes toward websites should lead to consequences similar to those found in traditional attitude research."

Numerous researchers have found that perceived interactivity has positive influences on either attitudes toward the website, attitudes toward the brand, purchase intentions, or all three of these variables combined (Jee & Lee, 2002; Macias, 2003; Sundar, Kalyanaraman, & Brown, 2003; for a more extensive list, see Wu, 2005). Therefore, if highly personalized ads yield higher perceived interactivity, then a second hypothesis should also be true:

H2: High (versus low) personalization will yield more positive (a) attitudes toward the website, (b) attitudes toward the brand, and (c) purchase intentions.

However, Wu (2005) found that it is possible for both actual and perceived interactivity to have an effect on attitudes toward the website when examined independently. Perceived interactivity was found to be a mediating variable for actual interactivity. Due to this finding, the proposed study will also examine *perceived interactivity as a mediator of actual interactivity on attitudes and intentions*. If personalization is considered a part of control, and therefore a part of actual interactivity, then the final hypothesis in this study expects that:

H3: Responses to personalization will be mediated by perceived interactivity.

Results of this study will be useful to interactive advertising scholars as well as practitioners because it will help to better define media features and advertising tools that effect the impact of interactivity, and, in-turn, interactive advertising. It is expected that this study will lead to future research projects that more closely examine the way personalization works on/with interactivity.

CHAPTER 3: METHODOLOGY

EXPERIMENTAL DESIGN

To test these hypotheses an experiment was conducted in a laboratory setting in which each person accessed an e-commerce website, Lands' End ©, via a computer. The experiment was a between-subjects design with participants assigned to one of two groups, either a low- or high-personalization group. Participants in both groups were asked to respond to measures of perceived interactivity, attitudes, and purchase intentions at the end of the experiment.

During the week before the experiment, all participants were asked to fill out and return a survey via e-mail, in which they rated attitudes toward the Lands' End © brand. In order to assess the skill level of the participants, this questionnaire also included questions about the participant's level of experience with the Internet, and with 3-D product presentation and virtual reality (Yoon, 2005). All of these measures were taken in advance of the actual experiment to control for any influence these variables may have had on the results.

PARTICIPANTS

Participants (N=78) consisted of undergraduate and graduate students at a large Midwestern university. There were 20 males and 58 females. Eighty-six percent of the students who participated were Caucasian. Participants' ages ranged from 19 to 26 years-old, with a mean age of 21 years-old. Table 1 provides mean scores for the participants'

prior experience with online shopping and its technology. Participants were recruited through classroom visits. Students in classrooms were given class credit for their participation. Participants were randomly assigned to the two experimental conditions (high versus low personalization).

Table 1
Mean Scores for Participants' Experience with Online Shopping and Technology

Variable	Mean Score
Hours spent on computer per week	3.01
Number of purchases over the Internet in the last year	2.94
Internet experience ^a	6.24
3-D/virtual technology experience ^b	2.4

Note. Internet purchases and average hours on the computer are given here for descriptive purposes only. Internet experience and 3-D/virtual technology experience are further explained in the Methods section, as they are used as control variables in this study.

^a Internet experience was measured on an index using a two-question, seven-point Likert scale, with 1 being not at all experienced/comfortable using the Internet, and 7 being very experienced/comfortable using the Internet.

^b 3-D/virtual technology experience was measured on an index using a three-question, seven-point Likert scale, with 1 being not at all experienced/comfortable/familiar with this technology and 7 being very experienced/comfortable/familiar with this technology.

STIMULUS

Based on Li, Daugherty, and Biocca's (2001) research, interface properties of a 3-D product include options for rotation, zooming in and out for inspection, animated features and functions, and changing colors or contexts of the product (as cited by Li, Daugherty & Biocca, 2002, p.44). Li, Daugherty and Biocca's (2002) research also found that a 3-D product presentation was significantly favored over a 2-D presentation

when evaluating a tactile product, such as clothing (in their experiment, a jacket). In light of this information, this study's stimulus used a 3-D product display on the clothing company website, www.landsend.com. By using an actual corporate website and 3-D product presentation, as opposed to a simulated environment, the ecological/external validity of the study is strengthened.

Lands' End Inc. © provides a 3-D product presentation on its site called "My Virtual Model" (MVM). When first entering MVM, a pop-up window is displayed that asks the user to choose a male or female model, based on the user's own gender. Within the pop-up window, a human model appears on the left side and a clothing catalog appears on the right. This interface allows the user to personalize the model by entering information about his or her size, skin color, hair color, eye shape, weight, and maturity. The user is also asked to give the model a name.

The model can be rotated a full 360 degrees. The user can zoom in and out to examine the clothes the model is wearing. When the user begins shopping the model is shown wearing only undergarments. The user is allowed to choose different types of clothing and accessories under the "My Virtual Model" tab at the top of the pop-up window, all from Lands' End © clothing catalogs (for either men or women, depending on which model was chosen). As the user chooses clothing from the displayed catalog on the right of the pop-up window, it is simultaneously placed on the model on the left side of the pop-up window.

The user can change the model's appearance at any time under a tab called "Personalization." Another tab, labeled "My Fit", allows the user to view the appropriate

size of the chosen clothing, according to the measurements he or she entered in the beginning. “E-mail My Model” allows the user to send the model; via an e-mail to any person they wish, with a note explaining what the model is. The final tab is labeled “Help.” It explains the product display interface, offers troubleshooting tips, and also website contact information in case the user needs additional help.

PROCEDURE

During the week before the experiment, participants were sent a copy of the written consent form for their review via e-mail, along with the pre-experiment survey. They were asked to bring a signed copy of the form with them to the experiment, and to send a completed copy of the pre-experiment survey back to the researcher via e-mail. During the experiment, the experimenter reviewed the written consent form with the participant verbally to make sure the participant understood the nature of the study, its risks, and its benefits. Participants who did not bring in a written copy of the consent form were asked to sign one before beginning the experiment, and all participants were given a copy to take with them.

After consent was obtained, the participant was asked to sit at a computer where MVM was displayed on the screen. The participant was given a written set of directions based on his/her assignment to either the high- or low-level personalization group. These directions were also explained aloud to provide a more clear understanding of MVM and minimize any confusion. MVM was described as a virtual model on www.landsend.com, on which a user can choose to view the products from the online catalog. Each user was told that they had 10 minutes to read the instructions and browse the clothing selection on

MVM. Participants were allowed only 10 minutes to prevent overexposure (Li, Daugherty, & Biocca, 2002).

If the participant was assigned to the high-personalization group he/she was allowed to navigate freely through MVM, personalizing MVM as he/she wished without restriction (see http://levdr.mvm.com/leus/images/i_home_page.jpg to view model). He/she was directed to choose the model that is consistent with his/her gender. The participant was then asked to fill-in information under the “personalization” tab. Because the “personalization” information inquires about some of the user’s exact measurement in inches, the participant was not expected to know all of this information during the experiment. He/she was instead asked to fill-in this information to the best of his/her ability. After entering the appropriate information in the personalization tab, the participant was asked to browse the online clothing and accessories catalog in the pop-up window. Participants were encouraged to browse as they would under normal conditions. No restrictions were placed on the use or browsing of MVM for the high-personalization group.

If the participant was assigned to the low-personalization group, he/she was directed to choose the model that is consistent with his/her gender. However, unlike the high-personalization participants, low-personalization participants were not allowed to fill out information under the “personalization” tab. He/she was asked not to navigate away from the current viewing screen – not to click on any tabs that would take him/her away from the model/clothing page. This eliminated the participant’s opportunity to personalize the 3-D product display, thereby limiting some of the participant’s control.

After the ten minutes had passed, participants were asked to fill out a questionnaire that measured perceived interactivity, personalization, attitude toward the website, attitude toward the brand, and purchase intent; as well as a few demographic questions collected as background information. After the collection of the data, participants were debriefed, thanked, and dismissed. Participants were given class credit for their participation.

INDEPENDENT VARIABLE

PERSONALIZATION

A virtual manikin was presented to each user. High personalization was operationalized for one group as asking each participant to adjust the product presentation stimulus so that it was representative of him/herself. That is, the user was able to attribute his/her physical characteristics to the manikin, thereby making it more personally relevant to him/herself. For example, a person with brunette hair could click a button to make the hair on the manikin brunette. Similarly, a person with an hour-glass figure who is 165 pounds and 5'8" could enter this information to make the manikin appear more like him/herself.

Low personalization was operationalized for the other group as not allowing them the option of this manikin manipulation. Instead, the low-personalization group was asked not to navigate away from the screen, thereby not allowing the group the option to change the manikin's appearance. While a small amount of personalization was present, because the manikin was the same gender as that of the participant, the level of personalization was low compared to the high-personalization group.

DEPENDENT VARIABLES

ATTITUDE TOWARD THE WEBSITE

Attitude toward the website was measured using Chen and Wells (1999) A_{ST} scale. Attitude toward the website is, at least in part, a predictor of attitude toward the brand and purchase intention (Jee & Lee, 2002). Chen and Wells (1999) adapted the A_{ST} scale from the attitude toward the ad scale (A_{AD}) contributed to by MacKenzie, Lutz, and Belch (1986), as well as Shimp (1981). A_{AD} has its roots in Fishbein's (1967) theory of reasoned action, and has therefore shown strong positive correlations with purchase intention and brand loyalty (as cited in McMillan, Hwang, and Lee, 2003). Since this adaptation, many studies have used A_{ST} to assess the effects of multiple variables on websites (Coyle & Thorson, 2001; McMillan, 2002; Jee & Lee, 2002; Raney, Arpan, Pahupati, & Brill, 2003).

A_{ST} consists of six items, five of which are measured on a five-point Likert scale anchored by "definitely disagree" and "definitely agree." The stem for these five items is "Please indicate your level of agreement with the following statements." The items are as follows: (1) This website makes it easy for me to build a relationship with this company. (2) I would like to visit this website again in the future. (3) I'm satisfied with the service provided by this website. (4) I feel comfortable in surfing this website. (5) I feel surfing this website is a good way for me to spend my time. The sixth item was also measured on a five-point Likert scale anchored by "one of the worst" and "one of the best." The stem for this item is "Compared with other websites, I would rate this one as..."

A factor analysis followed by a Varimax rotation revealed that these six items loaded onto two factors, referred to as A_{ST1} and A_{ST2} . Questions one, three, four and six loaded onto A_{ST1} ; and questions two and five loaded onto A_{ST2} . A_{ST1} consists of questions that are related to the user's judgment of the experience as they spent time on the website. A_{ST2} consists of questions that are related to the user's desire to spend more time on the website outside of the task which was asked of them. That the six A_{ST} items loaded onto factors in this way suggests that there was some inconsistency between a user's judgment of the site and their desire to return. The factors accounted for 69.8% of the total variance. Eigenvalues and reliability coefficients for each factor are shown in Table 2.

Table 2

Factor Analysis Statistics for A_{ST}

<u>Factor Loading</u>	<u>Eigenvalue</u>	<u>Reliability Coefficient</u>
A_{ST1}	2.99	.81
A_{ST2}	1.2	.70

ATTITUDE TOWARD THE BRAND

Attitude toward the brand is measured using a widely-published scale from MacKenzie and Lutz (1989). This is a seven-point semantic-differential scale that asks the participant to rate the brand on three items using the scale stem "Please rate the Lands' End © website on the following items." The items included bad/good, pleasant/unpleasant, and favorable/unfavorable.

A factor analysis followed by a Varimax rotation revealed that these three items loaded onto a single factor. The total item variance was 67% and the eigenvalue was 2.01. The items were subsequently summed to form a single index. The reliability coefficient for this measure was .75.

PURCHASE INTENTION

Purchase intention is a common measure of effectiveness that is often used to anticipate response behavior. The method of asking a participant to evaluate a product/brand/website is prevalent in the literature (Coyle & Thorson, 2001; Li, Daugherty, & Biocca, 2002). Li, Daugherty and Biocca (2002) cited a scale from Bearden, Lichtenstein and Teel (1984), which they used to study consumer's intention to purchase a product after evaluating it in a 3-D presentation. The current experiment used this four-item, seven-point semantic-differential scale (unlikely/likely, improbable/probable, uncertain/certain, and definitely not/definitely) to measure the likelihood that participants would purchase the products they chose to view while browsing the site. The participant was prompted to complete the ratings using the stem "Please indicate the extent to which you would purchase the product(s) you just saw on the following items."

A factor analysis followed by a Varimax rotation revealed that these four items loaded on a single factor. The total item variance was 74% and the eigenvalue was 2.94. The items were therefore summed to form an overall index of purchase intention. The reliability coefficient for this measure was .84.

MEDIATING VARIABLE

PERCEIVED INTERACTIVITY

To measure perceived interactivity, this study used an adapted interactivity scale from Liu (2003). Liu's scale was designed to measure the interactivity of websites on the three dimensions of active control, two-way communication, and synchronicity. Because this research defines interactivity in terms of control, the synchronicity and communication portions of the scale were not included. The measure uses a four-item, seven-point semantic-differential scale, anchored in "strongly agree" and "strongly disagree" (Liu, 2003). This scale exhibited a high level of validity and reliability for differentiating levels of interactivity for different websites. It also corresponded well with users' qualitative responses to websites (Liu, 2003), and therefore is justified in its use here. Participants were asked to "Please circle the number that indicates your agreement or disagreement with each of the following statements regarding the Lands' End © website":

- I felt that I had a lot of control over my visiting experiences at this website.
- While I was using the product display model I could choose freely what I wanted to see.
- While I was using the product display model, I had absolutely no control over what I could do to the model.
- While using the product display model, my actions decided the kind of experiences I got.

A factor analysis followed by Varimax rotation revealed a single factor. The total item variance was 66.1% and the eigenvalue was 2.64. These four items were subsequently summed to form a single index for perceived interactivity. The reliability coefficient for this measure was .83.

CONTROL VARIABLES

EXPERIENCE WITH INTERNET AND 3-D TECHNOLOGY

Two control variables were measured in the pre-experiment survey: Internet experience, and 3-D/virtual technology experience. Studies have shown that individual differences with computer-related technology may affect attitudes toward computer media (Goldstein & Ford, 1978; Rich, 1983). Rodgers and Thorson (2001), taking a cue from Jih & Reeves (1992), warned against the confounding potential of these experiences. Heeding this warning, this study attempted to control for these variables by asking questions related to participant's experience with Internet and 3-D technology. These answers were factor analyzed, indexed, and used as covariates in the final data analysis.

In order to assess participants' experience using the Internet, two questions were asked relating to experience and comfort with this technology. Participants used a seven-point Likert scale to answer both questions. For the first question participants rated their experience with the Internet on a scale anchored by "not at all experienced" and "very experienced." Participants were prompted to rate their experience using the scale stem "How experienced are you with the Internet?" Additionally, participants were asked to rate their comfort with using the Internet on a scale anchored by "not at all comfortable" and "very comfortable." Participants were prompted to rate their comfort using the scale stem "How comfortable are you using the Internet?"

A factor analysis followed by Varimax rotation was conducted and revealed a single factor. The total item variance was 90.82% and the eigenvalue was 1.82. These

two items were therefore summed to create an overall index of Internet experience. The reliability coefficient for this measure was .90.

In order to assess participants' experience using 3-D/virtual technology, three questions were asked relating to experience, comfort, and familiarity with this technology – adapted from a screening questionnaire used by Yoon (2005). Before the questions were asked, 3-D/virtual technology was explained using the following statement:

The following questions are about 3-D/virtual technology and the Internet. On the Internet this kind of technology allows people to see what they would look like with different hair styles, at different weights, or even with plastic surgery.

Participants used a seven-point Likert scale for rating their answers to all three questions. For the first question, participants rated their experiences with 3-D/virtual technology on a scale anchored by “not at all experienced” and “very experienced.” Ratings were prompted using the stem “How experienced are you with using 3-D/virtual technology?” Secondly, participants rated their comfort with the technology on a scale anchored by “not at all comfortable” and “very comfortable.” Ratings were prompted using the stem “How comfortable are you using 3-D/virtual technology?” Lastly, participants rated their familiarity with 3-D/virtual visualizations on a scale anchored by “not at all familiar” and “very familiar.” Ratings were prompted using the stem “How familiar are you with 3-D visualization on the Internet such as 360 degree views or VR views?”

A factor analysis followed by Varimax rotation was conducted and revealed a single factor. The total item variance was 73.42% and the eigenvalue was 2.2. These

three items were therefore summed to create an overall index of 3-D/virtual technology experience. The reliability coefficient for this measure was .81.

DATA ANALYSIS

SPSS 13.0 was used for all data analysis. In addition to the aforementioned factor analyses, *t* tests were run to examine differences between means for H1 and H2; and, MANOVAs were run to examine the mediating hypothesis (H3), as well as to examine whether the control variables made a significant difference in the results. The *p* value used to determine significance was $p < .05$. A manipulation check was included in the post-experiment survey to determine the effectiveness of the high- versus low-personalization manipulation.

MANIPULATION CHECK VARIABLE: PERSONALIZATION

Personalization is the degree to which something is made for, directed, or adjusted to a particular individual (American Heritage Dictionary). To examine whether the manipulation of personalization in each experimental group was noticed, participants were prompted to use a five-point Likert scale, anchored by “strongly agree” and “strongly disagree” to indicate their agreement or disagreement with the statement “Please indicate to what extent you agree or disagree with the following statements”:

- My shopping experience was personalized for my specific needs.
- The display model resembled my personal attributes.
- The display model did **NOT** reflect my own appearance.
- My shopping experience was **NOT** adjusted to match my personal preferences.

A factor analysis followed by Varimax rotation was conducted and revealed a single factor. The total item variance was 61.63% and the eigenvalue was 2.47. These

four items were therefore summed to create an overall index of personalization. The reliability coefficient for this measure was .79.

During analysis, through an independent samples *t* test, it was determined that the main effect of personalization level on the manipulation check only approached statistical significance at $p = .08$, $F = 1.01$.

CHAPTER 4: RESULTS

HYPOTHESIS 1

Hypothesis one predicted that high (versus low) personalization would yield higher perceived interactivity. An independent samples *t* test was conducted to determine whether any significant mean differences emerged in personalization level with regard to perceived interactivity. The results revealed no significant differences ($p = .63$). Thus, hypothesis one was not supported.

HYPOTHESIS 2

Hypothesis two predicted that high (versus low) personalization would yield more positive (a) attitudes toward the website, (b) attitudes toward the brand, and (c) purchase intentions. Separate independent samples *t* tests were conducted for each of the dependent variables. The results revealed no significant differences for high versus low personalization on attitudes toward the website (A_{ST1} , $p = .26$; A_{ST2} , $p = .72$), attitudes toward the brand ($p = .79$) or purchase intention ($p = .95$). Thus, hypothesis 2 was not supported.

A subsequent pre-planned analysis was conducted to determine whether the results changed after including the control variables, Internet experience and experience with 3-D/virtual technology, in the statistical analysis. This was accomplished by conducting a MANOVA. Personalization (high versus low) was the independent variable. Attitude toward the brand, attitude toward the site and purchase intentions were the

dependent variables, and Internet experience and experience with 3-D/virtual technology were the control variables, or covariates. The results revealed that neither Internet experience nor 3-D/virtual technology were statistically significant within the model ($p = .63$ and $p = .85$, respectively). Therefore, the personalization level's effect on the dependent variables remained insignificant, as shown in Table 3.

Table 3

Multiple Analysis of Variance for Personalization Using Control Variables

Source	DV	df	F	Partial ETA squared	p
Between Subjects					
Personalization Level	A _{ST1}	1	1.7	.02	.20
(controlling for Internet Experience and 3-D/virtual technology experience)	A _{ST2}	1	.06	.00	.81
	A _{BR}	1	.06	.00	.81
	PI	1	.01	.00	.95

A final pre-planned analysis was conducted using the prior brand attitudes as a covariate. Again, a MANOVA was conducted using personalization as the independent variable, the same three dependent variables, and prior brand attitude as the covariate. In this analysis, prior brand attitude was shown to have a significant effect on the statistical model ($p = .00$). However, when determining whether personalization had a significant effect on the dependent variables when controlling for prior brand attitude, the p value was reduced but still not significant, as shown in Table 4. Thus, even after controlling for

Internet experience and experience with 3-D technology, as well as controlling for prior brand attitude, hypothesis two was not supported.

Table 4

Multiple Analysis of Variance for Personalization Using Prior A_{BR} as a Covariate

Source	DV	<i>df</i>	<i>F</i>	Partial ETA squared	<i>P</i>
Between Subjects					
Personalization Level	A_{ST1}	1	2.18	.03	.14
(controlling for prior A_{BR})	A_{ST2}	1	.60	.01	.44
	A_{BR}	1	.02	.00	.89
	PI	1	.10	.00	.75

HYPOTHESIS 3

Hypothesis three predicted that responses to personalization would be mediated by perceived interactivity. To test this hypothesis, a MANOVA was conducted using personalization as the independent variable and perceived interactivity as the covariate for the dependent variables, A_{ST} , A_{BR} , and PI. There were no differences that resulted in significant *p* values for any of the dependent variables, as shown in Table 5. Hypothesis three was therefore not supported.

Table 5

Multiple Analysis of Variance for Personalization Using Mediating Variable

Source	DV	<i>df</i>	<i>F</i>	Partial ETA squared	<i>P</i>
Between Subjects					
Personalization Level	A _{ST1}	1	1.08	.01	.30
(controlling for perceived interactivity)	A _{ST2}	1	.12	.00	.73
	A _{BR}	1	.16	.00	.69
	PI	1	.00	.00	.98

CHAPTER 5: DISCUSSION

THEORETICAL IMPLICATIONS

It is important for researchers to identify, isolate, and study the various aspects of interactivity (communication, control, etc.) so that they can better understand the role each plays in the continued understanding of interactivity and its effects on psychological processing. This study attempted to isolate one aspect of control – personalization – and determine its effect on psychological processes including attitude toward the website, attitude toward the brand and purchase intentions. This study also examined the role of perceived interactivity on these effects. In attempting to isolate the personalization variable, this research had two groups browse a clothing website using a 3-D model, which is highly interactive by nature. The research attempted to manipulate the personalization variable by having one group of participants to change the model's appearance in order to make the model personally relevant to the participant. Despite these efforts, the manipulation of personalization was not statistically significant, and yielded no significant effects on perceived interactivity, attitude toward the site, attitude toward the brand, or purchase intention.

Previous research has identified multiple variables that contribute to the level of interactivity in new media, including features such as communication, control, and synchronicity (Sundar, Kalyanaraman, Brown, 2003; Kioussis, 2002; Liu & Shrum, 2002; Bucy, 2004). While this research identified and manipulated one aspect of one of these features (personalization as an aspect of control), there were certainly other aspects that

appear to contribute to the level of interactivity embodied by the Lands' End © 3-D model. For instance the “Help” function, “E-mail my model” function, and “Live Chat” function on MVM are all part of the communication aspect of interactivity, contributing to a high-level of interactivity within MVM. Similarly, the zoom function, rotate function, and allowing the user to change the color of clothing on the model, are all part of the control aspect of interactivity – in addition to personalization – that contribute to the high level of interactivity within MVM. Based on the results of this study, one might speculate that because both groups were exposed to interactivity at such a high level, the personalization variable was not raised to a level high “enough” to yield significant mean differences. This supports the idea, undisputed in the research, that interactivity is comprised of a number of different variables that work together to contribute to the overall interactivity of a given medium.

Thus, while personalization likely has an important role to play in interactive media (Pavlou & Stewart, 2000), there is perhaps a level of interactivity in which the effects of increasing the personalization variable to a certain degree are minimal at best. Possibly, this is the case when comparing two similar, highly-interactive models, as in the case of the present research. This brings up an interesting question: What is the threshold of interactivity in which this specific degree of increase in the personalization variable yields insignificant effects? One can speculate that in terms of Lands' End's © My Virtual Model the personalization variable's effects would become significant using one of two methods: 1) by decreasing the level of interactivity the low-personalization group was exposed to or 2) by increasing the personalization to a far greater degree than MVM allowed.

The former of the two options could be employed by comparing the attitudes and behavior intentions of a participant who is allowed to browse using a 2-D model (a product photographed on a model that cannot be rotated 360 degrees), which is inherently low-, or even non-personalized to the user, to those of a participant who uses a personalized 3-D model as used in this study. The latter of the two options could be employed by comparing the attitudes and behavior intentions of a participant allowed to browse using a low-personalized 3-D model, as used in this study, to those of a participant who uses a more immersive type of virtual reality which would increase personalization to a far greater degree than was done in this study (e.g. importing one's own picture to place clothing on, or even using a Head Mounted Display and Data Glove to virtually recreate a shopping experience).

This interpretation of the findings suggests that there are optimal levels of personalization and of other variables under the interactivity umbrella, that yield an optimal level of interactivity – a level in which attitudes and purchase intentions are increased to favor the source of the advertising (in this case, Lands' End ©). The “optimal level” concept suggests that there is a point when increasing interactivity (and its aspects, such as personalization) ceases to have a positive effect on attitudes and purchase intentions. This concept has been discussed in both academic (Liu & Shrum, 2002) and practical literature (Hespos, 2005), though not to any great extent. In order to advance theories of interactivity, it is important to not only understand instances in which increasing aspects of interactivity is preferred, but also those instances in which it is not the best option (Rodgers & Thorson, 2000). The findings in this study highlight an instance in which the personalization aspect of interactivity does not yield significant

effects on attitude and intentions. Having established this, future research can explore larger or smaller manipulations of personalization and its effects, in order to approach an understanding of what is “optimal.” This idea has practical implications, as well as theoretical.

PRACTICAL IMPLICATIONS

The findings of this study suggest a re-assessment of the investment in 3-D technology as employed by e-commerce websites, similar to that of MVM. This is not to say that the 3-D model is unimportant or that it has negative effects. In fact, for Lands’ End ©, it is likely that quite the opposite is true. Sales conversion rates actually increased with the onset of the MVM experience (Haeberle, 2002). This is to be expected as the value of MVM on the Lands’ End © site is that it allows people to visually assess a product in many ways prior to purchase (Oh, 2004). The results of this study do not dispute the value of MVM, but suggest that MVM’s value does not lie in its current personalization options. In other words, MVM’s value may lie in the user’s ability to place clothes on a model that utilizes 3-D technology, but not necessarily in whether or not that model looks similar to the user.

For e-commerce sites that use technology similar to MVM, the cost of maintaining the personalization options may not be worth the rewards of that specific aspect of the technology. Based on the speculated explanation of this study’s findings, for personalization to make a difference in effects on attitudes and intentions, the technology would have to allow for a greater degree of manipulation. Because implementing MVM already offers the user an alternative to traditional 2-D views (as

suggested in the first methodological solution previously-stated), the solution for making personalization options a worthy investment would be to further increase the level of personalization that MVM allows the user (e.g. allowing the user to import his/her own picture into the virtual fitting room). Only further research can determine the validity of these implications.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This study's benefits lie in its exploration of the effects of personalization on perceived interactivity, within a real-world technology. Isolating personalization in this technology allowed the researcher to explore personalization's specific effects on perceived interactivity, as well as attitudes and intentions, adding to the knowledge of personalization in this area of interactive advertising research and also to the practical knowledge of highly interactive technology. In some ways, this study has established a starting point for future research of personalization's role in new media. Despite these strengths, there are some limitations that are outlined here.

The first of these limitations is the use of a real-world technology. As stated previously, this is a benefit to the study because it increases external validity. However, because this technology was created and controlled by a real-world agent and not the researcher, there was no control afforded to the experimenter. This lack of control in all likelihood contributed to the findings, in that it limited the degree to which personalization could be manipulated. Fortunately, this limitation can be overcome in future studies by creating a customized stimulus, or by working with the creator of the real-world stimulus to achieve the desired manipulation. Of course, cost is always a

consideration when conducting experiments that use new technology, which is one reason the present study used an already existing interactive display. The challenge for future studies, then, is to balance the need to have realistic stimuli within the confines of a perhaps small budget, while still maintaining some level of control (i.e., internal validity) over the stimulus environment.

In addition to this lack of control, another limitation could be the use of a student population as a convenience sample. First, the student population can be considered an unlikely target audience for Lands' End © clothing. However any effects of this were minimized because attitudes and intentions were being measured and compared between groups and not within, and because there was an attempt to control for previous brand attitude. Also, student samples are usually considered to detract from the external validity of a study. However, because student populations have a high level of experience with computers and the Internet, the use of this sample was considered appropriate for this Internet-based research. In order to control for any unwanted effect contributed by a student sample, future research should consider a longer recruitment process that includes screening for Internet experience and recruitment from populations inside and outside of the Lands' End © target audience.

Future research should also consider other variables that may have contributed to the results of these findings. One of these variables is a possible effect of the participant's own body image. Some media studies suggest that women exposed to images of beauty in advertisements and television commercials become extremely dissatisfied with their own body image and attractiveness (Myers & Biocca, 1992; Freedman, 1984; Irving, 1990). Invariably, this dissatisfaction with one's own body

image may play an important role in personal satisfaction with a site that asks one to depict oneself on a computer screen, thereby possibly affecting attitudes and intentions. Studies have outlined these body image differences in race and gender (Frisby, 2004; Molloy, 1998; Franzoi & Shields, 1984), and examining the personalization of interactive models through this lens might provide a more complete picture of the consumer's interaction with this technology.

Additionally, Rodgers and Thorson (2000) suggested that perhaps traditional advertising measures, without alteration, are not wholly appropriate to measure the effects of online media. For example, attitude toward the brand (A_{BR}) is a scale that was created to measure attitudes toward traditional advertising. Is this appropriate for measuring attitudes online? While Rodgers and Thorson (2000) likely had in-mind the development of new quantitative scales, there have been few attempts to study areas of interactivity qualitatively. In her research studying the effects of PR messages on the Web, Len-Rios (2002) used qualitative textual analysis to examine how candidates attempted to identify with Hispanics through new media. Would a similar qualitative approach to studying how e-commerce sites attempt to identify with their customers, through personalization in interactivity, illuminate how this advertising tool is used? Future research should consider this.

CONCLUSION

By examining the role of personalization in interactivity, this study attempted to highlight an area of interactivity that has not been previously-illuminated, thereby attempting to further examine the relationship between these two important advertising concepts. Whether redesigning the current study or examining additional elements as

suggested here, it is clear that the research opportunities are numerous. In an age where big ideas result in rapid advances in technology, it is important to examine and understand the smaller concepts that make-up the big picture. Doing so will allow researchers and practitioners to take full-advantage of the power of those big ideas. The results of further knowledge in this area will benefit both theory and practice, whatever the findings.

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