

온라인 쇼핑환경에서 상호작용성의 역할

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The Role of Interactivity in Online Shopping Environments

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Abstract

The purpose of this study was to examine the effect of interactivity on consumers' mental imagery, attitude toward a product, confidence in evaluation and purchase intention. The proposed model was examined by conducting an experiment using mock apparel websites. A total of 1,009 female college students enrolled at a major midwestern university in the USA participated in the experiment. A structural equation model was used to test the model. The results of the study indicate that interactivity positively influenced mental imagery, attitudes toward a product imagery, and confidence in evaluation. The structural equation model also revealed that mental imagery positively influenced attitude toward a product and confidence in evaluation. Finally, the results show that attitude toward a product and confidence in judgment positively affected purchase intention. The study provides valuable theoretical perspectives which aide in the understanding of the effect of interactivity on consumers' cognitive and behavioral responses, and helps retailers develop effective marketing strategies.

Key words: online shopping environments(온라인 쇼핑 환경), interactivity(상호 작용성), mental imagery(정신적 상상).

I. Introduction

The Internet is an effective tool for direct marketing and generates significant retail sales volume. Compared to in-store shopping, online shopping provides different characteristics in terms of physical environments. Online shopping allows consumers to shop from worldwide stores and to save time associated with in-

formation and store searching tasks found with traditional shopping. Non-store shopping environments provide not only time saving conveniences but also economical benefits for consumers by offering relatively low price products. Favorable and pleasant environments in which online shopping occurs (i.e., at home, 24/7 convenience) attract consumers and allow them to efficiently search for information and enjoy the shopping process^{1,2)}.

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1) Stephen K. Koering, "E-Scapes: The Electronic Physical Environment and Service Tangibility," *Psychology and Marketing* Vol. 20 No. 2 (2003), pp. 151-167.

In spite of benefits of online shopping, consumers still have difficulties making purchase decisions when shopping online because there is no opportunity for them to directly inspect a product and to evaluate specific product features. Indirect experience occurs in an online shopping environment because consumers cannot fully interact with a product³⁾. On the other hand, direct experience occurs in an in-store shopping environment because consumers directly interact with a product by touching fabrics and trying on garments to see how they fit their bodies. Direct product experience tends to enhance consumers' ability to process product-related information and is more likely to increase positive attitudinal confidence over indirect experience⁴⁾.

Online retailers try to reduce the lack of direct experiences and to stimulate a virtual experience by increasing online shoppers' interactions with the contents of online shopping environments. In a virtual environment, online shoppers indirectly examine products but are allowed to interactively control and manipulate contents and to freely navigate through a website. High interactive features (e.g., moving images, product rotation, zoom in or out function) can be associated with more active cognitions and affects, more favorable attitude toward a product, and greater purchase intentions versus low interactive advertising (e.g., indirect experience, static information presentation)^{5,6)}.

In spite of the importance of identifying possible roles of interactivity in online shopping environments, there is a lack of empirical research examining the impact of interactivity on online shoppers' responses. Therefore, the study focuses on addressing this research gap. The purpose of the study is to investigate the effect of interactivity on online apparel shoppers' cognitive and behavioral responses.

II. Review of Literature

I. Interactivity

Interactivity is defined as "interaction with media, a communication process and a method of controlling a message"⁷⁾. In online shopping environments, two dimensions of interactivity are classified: human-message interaction and human-human interaction⁸⁾. Human-message interaction refers to Internet users' interactions with contents (e.g., colors, sizes, graphics, sounds) and involves multi-media features, such as click function, zoom-in/out function, and hyperlinks⁹⁾. Human-human interaction occurs when online shoppers interact with retailers or other shoppers¹⁰⁾. Online retailers can provide product and service information (e.g., detailed style descriptions, return policy) to consumers, and consumers can give their feedback on products to marketers, request more information about products and service, and claim online problem diagnostics. These activities involve unique features of the

2) C. Ranganatha and Shobha Ganapathy, "Key Dimensions of Business-to-Consumer Web Sites," *Information and Management* Vol. 39 (2002), pp. 462-465.

3) Sylvia C. Mooy and Henry S. J. Robben, "Managing Consumers' Product Evaluation through Direct Product Experience," *Journal of Product and Brand Management* Vol. 11 No. 7 (2002), pp. 433-434.

4) *Ibid.*

5) Ann M. Fiore and Hyun-Jeong Jin, "Influence of Image Interactivity on Approach Responses toward an Online Retailer," *Internet Research: Electronic Networking Applications and Policy* Vol. 13 No. 1 (2003), pp. 44-47.

6) Hairong Li, Terry Daugherty and Frank Biocca, "Characteristics of Virtual Experience in Electronic Commerce: A Protocol Analysis," *Journal of Interactive Marketing* Vol. 15 No. 3 (2001), pp. 13-30.

7) Ching-Jui Keng and Hung-Yuan Lin, "Impact of telepresence Levels of Internet Advertising Effects," *Cyber Psychology & Behavior* Vol. 9 No. 1 (2006), p. 83.

8) Hanjun Ko, Chang-Hoan Cho and Marilyn S. Roberts, "Internet Uses and Gratifications: A Structural Equation Model of Interactive Advertising," *Journal of Advertising* Vol. 34 No. 2 (2005), p. 59.

9) *Ibid.*

10) *Ibid.*

Internet, such as email, chat rooms, and real-time feedback¹¹⁾.

Schlosser¹²⁾ explained object interactivity and navigation interactivity which can be classified as human-message interactions. Object interactivity refers to users' direct manipulation of a product in a virtual environment. For example, in online apparel shopping contexts, using a mouse and clicking a button to see a closer view of fabrics, different colors and alternative views (e.g., side and back views) of a product would be a direct manipulation. Navigation interactivity refers to the extent which users move freely through a website in terms of searching, accessing, and retrieving activities. The search engine and hyperlink functions facilitate navigation interactivity so that users freely move back and forth through a website and actively explore information about products at deep levels. These functions help shoppers easily compare various products by selecting and controlling contents displayed on websites.

Keng and Ling¹³⁾ described interactivity characteristics in Internet environments using four dimensions: participant equity characteristics, dynamic communication process characteristics, mutual understanding characteristics, and message controlling characteristics. Participant equity characteristics are associated with the ability of the Internet to support exchanges of consumers' opinions and communication linkages between consumers. The communication follows dynamic pro-

cesses. In online environments, Internet users can exchange and express their opinions and stop the communication process at anytime. Through mutual communication processes, Internet users perceive others to be psychologically present and understand the contents of communication. The Internet also allows consumers to control messages by selecting to choose and add messages.

2. Mental Imagery

Imagery has been investigated in cognitive psychology and consumer behavior research and has been found to be important in information processing, generating affect and cognition, and forming intention¹⁴⁾. Imagery is defined as "a mental event involving visualization of a concept or relationship"¹⁵⁾ and "a process by which sensory information is represented in working memory"¹⁶⁾.

Past research investigated vivid and interactive pictures and concrete words as imagery eliciting strategies. Vivid pictures tend to facilitate visual imagery and cognitive elaboration of stimulus-relevant information in memory and enhance consumers' judgments about a purchase^{17,18)}. Babin and Burns¹⁹⁾ found that a concrete picture in a print advertisement influenced imagery processing more positively and resulted in more favorable attitude toward a brand and an advertisement than a less concrete picture or no picture. Childers and Houston²⁰⁾ studied the effect of pictorial

- 11) Heesook Hong and Gieuk Kim, "The Relationship between Interactions and Needs Satisfactions in Apparel Brand On-line Community," *Journal of the Korean Society of Clothing and Textiles* Vol. 29 (2005), p. 68.
- 12) Ann E. Schlosser, "Experiencing Products in the Virtual world: The Role of Goal and Imagery in Influencing Attitudes versus Purchase Intentions," *Journal of Consumer Research* Vol. 30 (2003), pp. 184-188.
- 13) Ching-Jui Keng and Hung-Yuan Lin, *Op. cit.*, pp. 82-94.
- 14) Deborah J. MacInnis and Linda L. Price, "The Role of Imagery in Information Processing: Review and Extensions," *Journal of Consumer Research* Vol. 13 (1987), pp. 473-487.
- 15) Kathy A. Lutz and Richard J. Lutz, "Imagery-Eliciting Strategies: Review and Implications of Research," *Advances in Consumer Research* Vol. 5 No. 1 (1978), p. 611.
- 16) Deborah J. MacInnis and Linda L. Price, *Op. cit.*, p. 473.
- 17) Jolita Kisielius and Brian Sternthal, "Detecting and Explaining Vividness Effects in Attitudinal Judgment," *Journal of Marketing Research* Vol. 21 (1984), pp. 54-64.
- 18) Deborah J. MacInnis and Linda L. Price, *Op. cit.*, pp. 473-487.
- 19) Laurie A. Babin and Alvin C. Burns, "Effects of Print Ad Pictures and Copy Containing Instructions to Imagine on Metal Imagery that Mediates Attitudes," *Journal of Advertising* Vol. 26 No. 3 (1997), pp. 40-43.

and verbal information on immediate and delayed recall, and found that pictures were more quickly recalled than verbal information when memory was measured over time. Lutz and Lutz²¹⁾ found that interactive pictures were superior to noninteractive pictures and words in terms of recall and learning features of a product and a brand.

In general, pictures are considered to be a relatively vivid type of information and to be more attention-getting and easier to process as compared to words. However, researchers have found that concreteness and vividness of verbal information also activated mental imagery processes. In a study by Rossiter and Percy²²⁾, concrete copy was more effective than abstract copy. High imagery words help people evoke images in their minds, understand the message, and are superior for memory retrieval as compared to low imagery words²³⁾.

3. Stimulus-Organism-Response (S-O-R) Paradigm

Mehrabian and Russell²⁴⁾ reasoned that physical environmental cues (S) influence consumers' cognitive and emotional responses (O) which finally intervene between physical environmental cues (S) and behavioral responses (R). Baker, Parasuraman, Grewal, and Voss²⁵⁾ classified in-store shopping environmental cues into three categories: Social factors (e.g., employee perceptions), design factors (e.g., layout, style), and

ambient factors (e.g., music, scent). Based on the S-O-R paradigm, Eroglu, Machleit, and Davis²⁶⁾ developed a model and explained that online environmental cues (e.g., pictures of a product, descriptions of products, webpage background) affect online shoppers' affective (e.g., pleasure, arousal, dominance) and cognitive internal states (e.g., attitudes, beliefs), which ultimately influence online shoppers' behavioral responses (e.g., purchase intention, word-of-mouth intention).

III. Methods and Procedure

1. The Development of The Model and Hypotheses

(Fig. 1) illustrates the model of the study. The S-O-R paradigm provided the theoretical framework because the study focused on how interactivity (S) influences consumers' mental imagery, attitude toward a product, and confidence in evaluation (O), finally affects purchase intention (R).

Past research has found that vivid and concrete pictures stimulate consumers' mental imagery and positive cognitive responses²⁷⁾. Interactive features (e.g., zoom-in/out and close-ups) in online shopping may play a role in increasing the vividness of product presentations. When people manipulate and interact with contents, people may perceive that the mediated

20) Terry L. Childers and Michael M. Houston, "Conditions for a Picture Superiority Effect on Consumer Memory," *Journal of Consumer Research* Vol. 11 (1984), pp. 643-655.

21) Kathy A. Lutz and Richard J. Lutz, "The Effects of Interactive Imagery and Learning: Application to Advertising," *Journal of Applied Psychology* Vol. 62 (1977), pp. 493-498.

22) John R. Rossiter and Larry Percy, "Visual Imaging Ability as a Mediator of Advertising Response," *Advances in Consumer Research* Vol. 5 (1978), pp. 621-662.

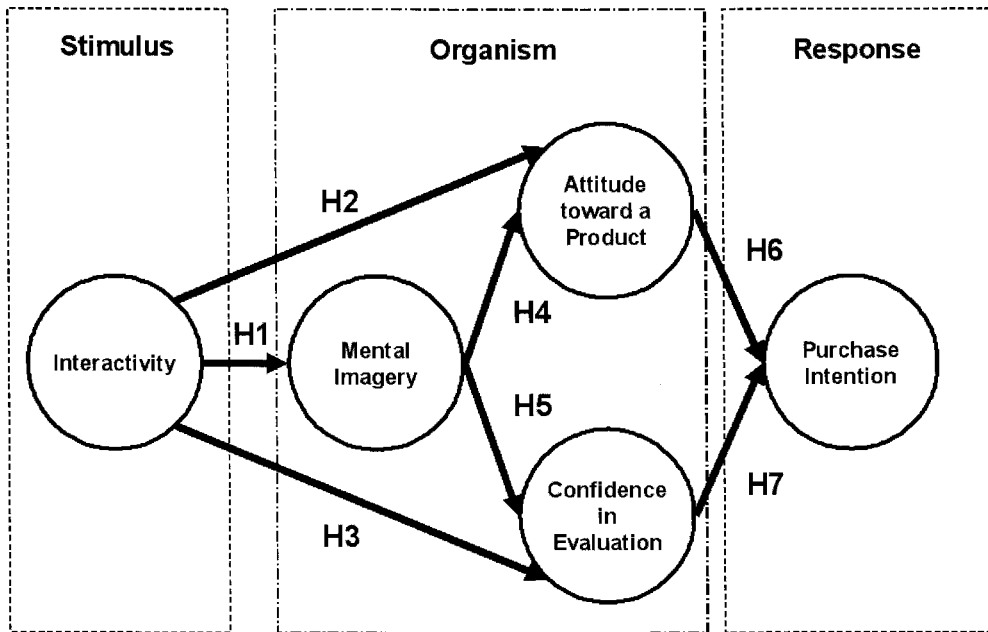
23) H. Rao Unnava and Robert E. Burnkrant, "An Imagery-Processing View of the Role of Pictures in Print Advertisements," *Journal of Marketing Research* Vol. 33 (1991), pp. 226-231.

24) Albert Mehrabian and James A. Russell, *An Approach to Environmental Psychology* (Cambridge, MA: MIT Press, 1974).

25) Julie Baker, A. Parasuraman, Dhruv Grewal, and Glenn B. Voss, "The Influence of Multiple Store Environment Cues on Perceived Merchandise Value and Patronage Intentions," *Journal of Marketing* Vol. 66 (2002), pp. 120-141.

26) Sevgin A. Eroglu, Karen A. Machleit and Lenita M. Davis, "Atmospheric Qualities of Online Retailing: A Conceptual Model of Implications," *Journal of Business Research* Vol. 54 (2001), pp. 177-184.

27) Deborah J. MacInnis and Linda L. Price, *Op. cit.*, pp. 473-487.



<Fig. 1> The Proposed Model of the Study.

contents satisfy their information needs. Increased opportunities to process information by using interactive features may stimulate perceived mental imagery and positively influence consumers' decision making activities (e.g., attitude toward a product, confidence in judgment). Research has studied the effectiveness of interactivity on the Internet and found positive effects of interactivity on consumer responses. Keng and Lin²⁸⁾ found that high levels of interactivity positively influenced recall and recognition for Internet advertising. Ko, Cho and Roberts²⁹⁾ found that the more consumers engage in human-message interaction on a website, the more positively consumers evaluate websites and brands. Schlosser³⁰⁾ found a positive relationship between object interactivity and mental imagery. It is expected that perceived interactivity associated with interactive features (e.g., zoom-in/out, close-ups)

will enhance vivid mental imagery and lead to positive attitude toward a product and confidence in evaluation. Therefore, the following hypotheses were developed.

- H1: Interactivity will positively influence mental imagery.
- H2: Interactivity will positively influence attitude toward a product.
- H3: Interactivity will positively influence confidence in evaluation.

When online shoppers are unable to directly examine a product in online shopping contexts, high mental imagery may play an important role in compensating for the lack of physical contact, attracting shoppers to explore websites, and leading to favorable product evaluations^{31,32)}. Peck and Childers³³⁾ found that high

28) Ching-Jui Keng and Hung-Yuan Lin, *Op. cit.*, pp. 82-94.

29) Hanjun Ko, Chang-Hoan Cho and Marilyn S. Roberts, *Op. cit.*, pp. 66-68.

30) Ann E. Schlosser, *Op. cit.*, pp. 196-197.

31) Deborah J. MacInnis and Linda L. Price, *Op. cit.*, pp. 473-487.

imagery information tends to reduce frustration associated with product evaluations and positively influence perceptions of product quality. Fiore and Yu³⁴⁾ found that imagery copy and fabric samples positively influenced pre-purchase approach responses and attitudes toward a product in a catalog apparel shopping context. Branthwaite³⁵⁾ maintained that mental imagery plays an important role in influencing emotions and confidence in a product benefit. Based on this rationale the following hypotheses were developed.

H4: Mental imagery will positively influence attitude toward a product.

H5: Mental imagery will positively influence confidence in evaluation.

Past research has found relationships between attitude toward a product and purchase intention and between confidence in evaluation and purchase intention. Yoh, Damhorst, Sapp, and Laczniak³⁶⁾ discovered that attitude toward internet shopping is positively related to apparel buying intention on the Internet. If customers are uncertain about a product and have negative attitudes toward a retailer, they tend to postpone purchase decisions, reduce purchase intention and engage in complaining and switching behavioral responses³⁷⁻³⁹⁾. Thus, it is expected that favorable atti-

tudes toward a product and confidence in evaluation will increase purchase intentions. This discussion led to the development of the following hypotheses.

H6: Attitude toward a product will positively influence purchase intention.

H7: Confidence in evaluation will positively influence purchase intention.

2. Experimental Design

An experiment was designed based on the online apparel shopping context. To manipulate levels of interactivity, three mock apparel websites were developed using different levels of interactivity (low, medium or high interactivity). In the high interactivity condition, a close-up function and a larger view function were provided. The functions allowed participants to select diverse close-ups of garment parts (e.g., shoulder, hem, waist). In the medium interactivity condition, only a close-up function was provided. Both the high and medium interactivity conditions contained a basic picture of garment. The low interactivity condition provided only the basic picture of the garment without any detailed functions (e.g., close-ups, larger views). A pretest was performed to select the stimuli (two dresses) used in the main experiment. Pictures of ten dresses were chosen from apparel websites and

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- 32) Vicky McKinney, Kanghyun Yoon, and Fatemeh M. Zahedi, "The Measurement of Web-Customer Satisfaction: An Expectation and Disconfirmation Approach," *Information Systems Research* Vol. 13 No. 3 (2002), pp. 296-315.
- 33) Joann Peck and Terry L. Childers, "To Have and to Hold: The Influence of Haptic Information on Product Judgments," *Journal of Marketing* Vol. 67 (2003), pp. 38-46.
- 34) Ann M. Fiore and Hong Yu, "Effects of Imagery Copy and Product Samples on Response toward the Product," *Journal of Interactive Marketing* Vol. 15 No. 2 (2001), pp. 36-46.
- 35) Alan Branthwaite, "Investing the Power of Imagery in Marketing Communication: Evidence-Based Techniques," *Qualitative Market Research* Vol. 5 No. 3 (2002), p. 170.
- 36) Eunah Yoh, Mary L. Damhorst, Stephen Sapp, and Russ Laczniak, "Consumer Adoption of the Internet: The Case of Apparel Shopping," *Psychology and Marketing* Vol. 20 No. 12 (2003), pp. 1095-1118.
- 37) Alan S. Dick and Kunal Basu, "Customer Loyalty: Toward an Integrated Conceptual Framework," *Journal of the Academy of Marketing Science* Vol. 22 No. 1 (1994), pp. 99-113.
- 38) Leo R. Vijayarathy and Joseph M. Jones, "Print and Internet Catalog Shopping: Assessing Attitudes and Intentions," *Internet Research: Networking Applications and Policy* Vol. 10 No. 3 (2000), pp. 191-202.
- 39) Valerie A. Zeithamal, Leonard L. Berry, and A. Parasuraman, "The Behavioral Consequences of Service Quality," *Journal of Marketing* Vol. 60 No. 4 (1996), pp. 31-46.

evaluated by a convenience sample of 32 female college students in terms of attractiveness, fashionability, likableness, and likelihood of purchase using 7-point Likert-type scales. The two dresses which retained the fifth and sixth ranks with medium mean scores were selected for the main study.

3. Sample and Procedure

The sample selected for the study consisted of female college students because young, well-educated women are known as the main customers of apparel online retailers⁴⁰. A list of 4,800 female college students enrolled at a major midwestern university was randomly selected and provided by the Office of the University Registrar. The sample received an email which explained the purpose of the study and included a URL link to one of three mock websites. After agreeing to participate in the experiment, participants were instructed to browse a website and to complete a questionnaire which included items tapping demographics, interactivity, mental imagery, attitude toward a product, confidence in evaluation, and purchase intention.

4. Measures

The dependent variables used in the study were interactivity, mental imagery, attitudes toward a product, confidence in evaluation and behavioral intentions. Five items developed by Schlosser⁴¹ were used to measure interactivity. Mental imagery was measured by using seven items from Ellen and Bone⁴². Two items developed by Peck & Childers⁴³ were used to measure confidence in evaluation. Interactivity, mental

imagery, and confidence in evaluation were measured using 7-point Likert scales (1 strongly disagree, 7=strongly agree). Attitudes toward a product were measured with Bruner's⁴⁴ 6-item 7-point semantic differential scale (e.g., the dress is 'bad-good', 'unappealing-appealing'). Purchase intention was measured by using an item (i.e., I would purchase the dress which I evaluated) with 3-item 7-point semantic differential scales (e.g., 'unlikely-likely', 'improbable-probable', and 'impossible-possible'). All scales had adequate reported reliabilities reported in the literature (Cronbach's α s=0.80 -0.93).

IV. Results

1. Sample Description

The total of 1,385 female college students participated in the experiments for a response rate of 21.64%. After eliminating 86 unusable responses, 1,299 responses were used for the analyses in the study. The average age of participants was 21 years old. About 80% of the participants were Caucasian.

2. Preliminary Analysis

A manipulation check on interactivity was performed. ANOVA results revealed significant differences in perceived interactivity among the high interactivity condition ($M_{high}=5.23$, $SD=1.05$), the medium interactivity condition ($M_{medium}=5.21$, $SD=1.08$), and the low interactivity condition ($M_{low}=4.96$, $SD=1.05$), [$F(2, 1006)=7.03$, $p=0.001$].

According to Anderson and Gerbing's⁴⁵ two-step

40) Internet Retailer, *Women make up nearly two-thirds of online apparel and beauty shoppers* [database online](12 March 2004[retrieved 10 October 2005]); available from World Wide Web@: <http://internetretailer.com/dailynews.asp?id=11521>.

41) Ann E. Schlosser, *Op. cit.*, p. 188.

42) Pam S. Ellen and Paula F. Bone, "Measuring Communication-Evoked Imagery Processing," *Advances in Consumer Research*, Vol. 18 (1991), pp. 806-812.

43) Joann Peck and Terry L. Childers, *Op. cit.*, p. 39.

44) Gordon C. Bruner II, "Standardization and Justification: Do Ad Sales Measure Up?" *Journal of Current Issues and Research in Advertising* Vol. 20 No. 1 (1998), pp. 1-18.

45) James C. Anderson and David W. Gerbing, "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," *Psychological Bulletin* Vol. 103 No. 3 (1988), pp. 411-423.

modeling approach, confirmatory factor analysis (CFA) was conducted in order to assess the convergent validity and discriminant validity of the measurements. Using AMOS, a Maximum Likelihood function was employed to estimate parameters for the CFA. The measurement model was evaluated and then respecified based on theoretical and statistical considerations. The measurement model for the study was finalized and a final CFA model and factor loadings are presented in <Table 1>. The overall fit of the measurement model was assessed. The chi-square statistic was significant ($\chi^2=242.26$, $df=94$, $p=0.00$), indicating that the proposed model failed to fit the data. Since chi-

square statistics tend to be sensitive to a large sample size, other fit indices were considered and provided the evidence of good overall model fit (RMSEA=0.05, TLI=0.98, GFI=0.96, AGFI=0.94). Significant t -values of path coefficients provide evidence of convergent validity ($p=0.00$). Reliabilities of the latent variables were calculated and achieved (all Cronbach α s>0.80. See Table 1).

In order to assess discriminant validity, chi-square difference tests were conducted. Significant chi-square differences indicate that the constrained models are not equivalent to the unconstrained model, implying that two constructs are not perfectly correlated¹⁶⁾. Since all

<Table 1> Results from CFA of the Finalized Measurements

	Standardized Item Loading	Item Loading	SE	t	Cronbach's α
Interactivity (ξ 1)					0.91
(I1) The website provides tools to help me find what I was looking for.	0.88	1.15	0.04	28.12***	
(I2) I liked the ease of finding whatever I sought.	0.91	1.19	0.04	29.37***	
(I3) I found what I wanted to very quickly.	0.84	1.11	0.04	26.35***	
Mental imagery (ξ 2)					0.80
(M1) The imagery which occurred were unclear.	0.75	1.04	0.05	20.74***	
(M2) The imagery which occurred was detailed.	0.66	0.90	0.05	14.69***	
(M3) The imagery which occurred was vague.	0.88	1.26	0.05	24.85***	
Attitude toward a product (ξ 3)					0.93
(A1) good/bad	0.82	1.00	0.04	25.29***	
(A2) unappealing/appealing	0.89	1.27	0.04	28.98***	
(A3) unpleasant/pleasant	0.86	1.04	0.04	27.57***	
(A4) unattractive/attractive	0.88	1.19	0.04	28.58***	
(A5) likable/dislikable	0.78	1.00	0.04	23.70***	
Confidence in evaluation (ξ 4)					0.86
(C1) I was confidence in evaluating the dress.	0.92	1.14	0.05	24.29***	
(C2) I was sure of my judgment on the dress.	0.82	1.10	0.05	21.50***	
Purchase intention (ξ 5)					
I would purchase the dress which I evaluated.					
(PI1) likely/unlikely	0.92	1.81	0.06	30.56***	
(PI1) probable/improbable	0.97	1.83	0.06	33.26***	
(PI1) possible/impossible	0.80	1.46	0.06	24.89***	

*** $p<0.001$.

〈Table 2〉 Chi-Square Difference Test for Discriminant Validity

Constraint	Chi-square	df	Chi-square Difference	df Difference
Unconstrained model	242.26	94		
Interactivity & Mental imagery	805.28	95	563.02***	1
Interactivity & attitude toward a product	1417.12	95	1174.86***	1
Interactivity & confidence in evaluation	691.79	95	449.53***	1
Interactivity & purchase intention	1481.26	95	1239***	1
Mental imagery & attitude toward a product	827.89	95	585.63***	1
Mental imagery & confidence in evaluation	730.51	95	488.25***	1
Mental imagery & purchase intention	845.11	95	602.85***	1
Attitude toward a product & confidence in judgement	776.60	95	534.34***	1
Attitude toward a product & purchase intentions	1555.22	95	1312.96***	1
Confidence in evaluation & purchase intention	793.14	95	550.88***	1

*** $p < 0.001$.

chi-square difference tests were significant in this study, discriminant validity is achieved (See Table 2).

3. Hypothesis Testing

In testing hypotheses, structural equation analysis was performed via AMOS. The overall model showed a satisfactory fit: $\chi^2(97)=263.31$ ($p=0.00$), RMSEA = 0.05, GFI=0.95, AGFI=0.94, TLI=0.97).

Hypotheses 1, 2, and 3 address the effect of interactivity on mental imagery, attitude toward a product and confidence in evaluation. The results of the SEM showed significant positive effects of interactivity on mental imagery ($\gamma_1=0.36$, $t=8.06$, $p=0.00$), attitude toward a product ($\gamma_2=0.30$, $t=7.07$, $p=0.00$), and confidence in evaluation ($\gamma_3=0.41$, $t=9.45$, $p=0.00$). Therefore, hypotheses 1, 2, and 3 were supported (See Fig. 2).

Hypotheses 4 and 5 posit that mental imagery will positively influence attitude toward a product and confidence in evaluation. The results show a positive effect of mental imagery on attitude toward a product ($\beta_1=.24$, $t=5.43$, $p=0.00$) and confidence in evaluation

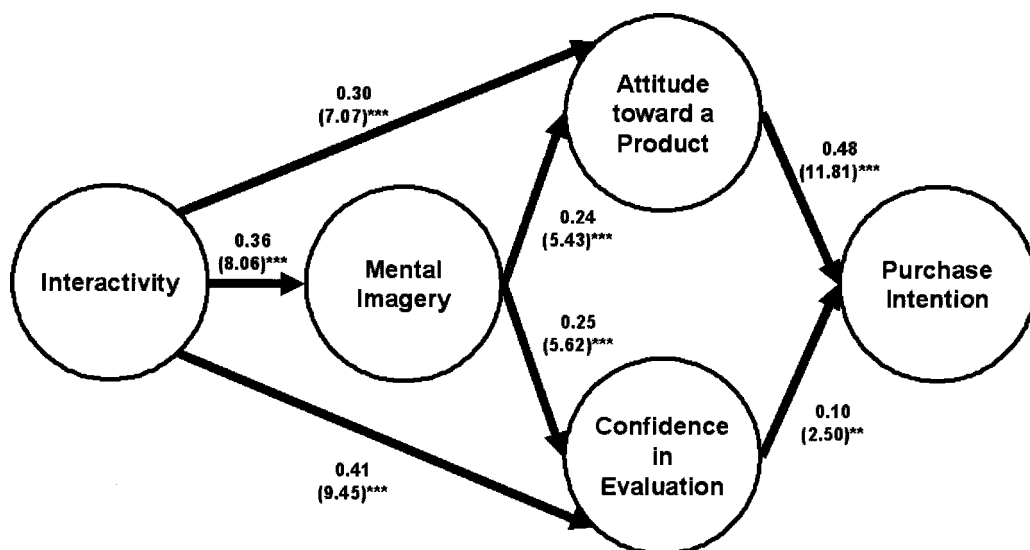
($\beta_2=0.25$, $t=5.62$, $p=0.00$). Thus, hypotheses 4 and 5 were supported (See Fig. 2).

Hypotheses 6 and 7 address the relationship among attitude toward a product, confidence in evaluation, and purchase intention. The results revealed that attitude toward a product ($\beta_3=0.48$, $t=11.81$, $p=0.00$) and confidence in evaluation ($\beta_4=0.10$, $t=2.50$, $p=0.01$) positively influence purchase intention. Therefore, hypotheses 6 and 7 were supported (See Fig. 2).

V. Discussions and Implications

This study investigated the roles of interactivity in online apparel shopping environments. The results of the study make contributions that advance our theoretical understanding of interactivity in online apparel shopping environments and online apparel retailing. Environmental psychologists have examined the effect of physical environmental cues on customers' affective, cognitive and behavioral responses based on the S-O-R paradigm. Applying the model used in the study to the S-O-R paradigm, evidence was provided in

46) Richard P. Bagozzi, Youjae Yi and Lynn W. Phillips. "Representing and Testing Organizational Theories: A Holistic Construal," *Administrative Science Quarterly* Vol. 27 (1982), pp. 459-489.



*** $p < 0.001$.

<Fig. 2> Results for Hypotheses 1 through 7.

the support of the ability of interactivity (an environmental cue) to influence mental imagery, attitude toward a product, and confidence in evaluation (cognitive responses) which ultimately affected purchase intention (behavioral responses). While online shoppers control and manage content in online shopping environments, they are likely to perceive interactivity, influencing active cognitive evaluations and behavioral responses. This study demonstrates that when participants use close-up and larger view functions, they virtually experience interactivity and vivid images by clicking on multiple times. When participants are exposed to websites containing high levels of interactive features, perceived interactivity was increases and positively influences mental imagery, attitude toward a product, and confidence in evaluation, and subsequently affects positive behavioral intention.

The results also provide practical implications by documenting the powerful roles of interactivity. In particular, this study focused on examining the effects of close-up and larger view functions as strategies for enhancing interactivity and found that interactivity elicited mental imagery, increased positive attitude to-

ward a product, and improved confidence in evaluation. Online apparel retailers need to identify which interactive features are effective in creating pleasant shopping experiences for online apparel shoppers, facilitate their active shopping tasks, and establish competitive advantages in online shopping environments. Online retailers try to create effective websites by using diverse interactive features and advanced multimedia functions (e.g., virtual models, three-dimensional graphics, product rotation, mix and match function, zoom-in/out function) because they believe that those features will attract customers and provide efficient shopping environments. For example, LAND'S END (www.landsend.com) and LANE BRYANT (www.lanebryant.com) provide a three-dimensional simulation function (My Virtual Model) which allows shoppers to create a virtual model by selecting body sizes, hair color and style, and facial shape, and try products on the model. However, the appropriate level of interactivity might be questionable. It is possible that complex online shopping environments with too many interactive features might negatively influence consumers' shopping processes and consumer responses. Advanced

multi-media features can influence download times online. Thus study suggests that online retailers need to explore and test the optimal level of interactivity.

Several limitations of this study were identified. The study used a female college student sample to conduct an experiment; which may limit generalization of the findings to other population groups (e.g., 40 year old females, 20 year old males). In addition, as mock apparel websites were developed for use in this experiment; the findings of the study might not be directly applicable to real-world settings and cannot be generalized beyond the experimental environments and manipulations. In addition, another limitation is the use of only one product category (i.e., dress). As a result, these findings may not be generalizable to other product categories (e.g., sweaters, shirts, and pants). Therefore, future studies may explore the effect of interactivity on consumers' responses by employing other product categories and real apparel websites.

This study focused on investigating the impact of human-message interactions which are facilitated by multi-media features (e.g., close-up and larger view functions). In order to create pleasant shopping environments and facilitate shoppers' purchase decisions, online retailers strive to enhance not only human-message interactions but also human-human interactions which occur when online shoppers communicate with online retailers and other consumers by using email, review and chat functions^{47,48}. Lee and Koo⁴⁹ emphasized that retailers need to understand which characteristics of interactivity might be used as effective marketing strategies. Since apparel or beauty product

shoppers tend to consider their or others' past experiences using and purchasing products, it might be effective for online apparel and beauty product retailers to enhance human-human interactions⁵⁰. For example, drugstore.com provides a "customer reviews" service which allows consumers to write reviews of beauty products which they have used. Alloy.com provides an opportunity for consumers to write their opinions of current fashion trends and styles and allows them to email their friends about product information on the website. Therefore, future research may examine which functions enhance human-human interactions and finally influence shoppers' positive responses.

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