온라인 제품정보와 시각적 심상 :
감정과 제품품질지각에 미치는 영향

Online Product Information and Visual Imagery:
Effects on Mood and Perceived Product Quality

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<Abstract>

The purpose of this study was to examine the effect of visual imagery stimulated by product information on consumer responses in online shopping contexts. Dual coding theory provided the theoretical framework of the study. The proposed model of the study was examined by conducting an experiment using mock apparel websites with a between-subject factorial design: [2 (pictorial information: detailed views vs. no detailed views) x 2 (verbal information: detailed descriptions vs. abstract descriptions)]. A total of 439 female college students participated in the experiment, and 433 responses were ultimately used to test the hypotheses. The findings from the results revealed: (1) the main effects of the pictorial and verbal information on visual imagery, and (2) positive relationships between (a) visual imagery and mood, (b) visual imagery and perceived product quality, (c) mood and perceived product quality, and (d) perceived quality and purchase intentions.

본 연구의 목적은 온라인 쇼핑 환경에서 제품정보에서 유발된 시각적 심상이 소비자의 반응에 미치는 영향에 관하여 조사하는 것이다. 본 연구는 이중부호화이론을 이론적 기반으로 하고 있으며, 2 (세밀한 vs. 비세밀한 시각적 정보) x 2 (세밀한 vs. 추상적 언어적 정보) 집단 간 실험설계를 통해 연구가설을 조사하였다. 여대생 439명이 실험에 참여하였고, 최종적으로 433명의 응답이 연구결과 분석에 이용되었다. 연구 결과를 살펴보면, (1)시각적 정보와 언어적 정보가 시각적 심상에 영향을 미치는 것으로 나타났으며, (2)시각적 심상과 감정 간에 정(+)의 관계를,(3)시각적 심상과 제품품질지각 간에 정(+)의 관계를, (4)감정과 제품품질지각 간에 정(+)의 관계를, (5)최종적으로 제품품질지각과 구매의도 간에 정의(+)관계를 갖는 것으로 나타났다.

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I. Introduction

Online shopping is one of the important marketing channels for retailing. The continuous increase in online retail sales has been shown over the years. From 2001 to 2006 the average annual growth rate for US online retail sales was 35.4% for total retail sales, as compared to 4.8% for total retail sales. Online retail sales accounted for about $107 billion in 2006 with an annual gain of 22% over 2005 (U.S. Census Bureau, 2008) and are expected to reach $329 billion in 2010 (Twice, 2005). In 2006, as the leading merchandise category for online retail sales, clothing and accessories generated $12 billion, followed by other merchandise with $11 billion and computer hardware with $9 billion.

As compared to in-store shopping, online shopping involves different retailing activities. In online shopping environments, consumers can save time and costs associated with information search and travel to physical stores since online stores are accessible 24 hours from anywhere (Kaufman-Scarborough & Lindquist, 2002). On the other hand, in-store shopping environments allow shoppers to walk into a physical store during only business hours. Since apparel and textile products are displayed on hangers and tables, shoppers are able to directly touch and interact with them in in-store shopping environments. Although product experimental information (e.g., garment fit) and haptic information (e.g., fabric hand) that consumers gather from actual touch and trials are important in apparel shopping, it is impossible for online shoppers to directly examine garments because products are presented online through a small computer screen. Due to the lack of actual experiences in online shopping environments, online retailers strive to present product information effectively and create pleasant web interface designs (Hong, Thong, & Tam, 2004; Park, Stoel, & Lennon, 2008).

Online apparel retailers look for ways to effectively use elements of websites to reduce perceived risks and to entice consumer to have approach responses toward products. Under the online shopping environments, pictorial and verbal product information may play a role in facilitating visual imagery (i.e., a process by which visual information is imaged in working memory) and compensating for actual product experiences. For example, advanced visual product presentations (e.g., close-ups, rotations, larger views) tend to enhance interactivity between products and consumers and virtual experiences of products and contribute to positive mood and favorable attitude toward the products (Park, 2008; Park, Stoel, & Lennon, 2008). Descriptions of products associated with garment fit and fabric hand may help shoppers recall their memories of past purchases and experience in wearing and touching similar garments and enhance consumers' positive responses to the products. Thus, effectively presenting pictorial and verbal information of garments will be a way to substitute for direct product experiences and to entice shoppers online.

Researchers have maintained the importance of product information in online shopping contexts, however there was no empirical research on the effect of visual imagery stimulated by product information on consumers' affective, cognitive and behavioral responses in online shopping contexts. Therefore, the study focused on examining (1) the role of pictorial and verbal information of products in stimulating visual imagery, and (2) the influence of visual imagery on mood and perceived product quality which finally affect purchase intention.

II. Literature Reviews

1. Dual Coding Theory and Visual Imagery

Dual coding theory is used as the theoretical framework of this study to examine comprehension of information processing. According to the dual coding

theory, nonverbal and verbal coding systems handle cognitive activities (Paivio, 1971; 1975). The nonverbal system deals with processing information related to nonverbal objects and events (e.g., images and pictures of products, background images), whereas the verbal system involves processing linguistic information (e.g., descriptions of products and services). Two systems are independent but partially interconnected (Paivio, 1971; 1975). Verbal and nonverbal systems are independently activated without the other. For example, we can remember an event with nonverbal images and without verbal descriptions. At the same time, since the two systems are interconnected, one system can activate the other system. For example, verbal descriptions stimulate our memory regarding images of an event and an object (Paivio, 1986; Paivio & Desrochers, 1980).

Nonverbal (pictorial) information is simultaneously processed because it tends to be more easily and rapidly encoded and switched among parts and wholes as compared to verbal information. On the other hand, verbal information is sequentially processed in the way that smaller units are organized into larger units. The simultaneous processing of pictorial information tends to be facilitated more quickly than the sequential processing of verbal information (Paivio, 1986; Paivio & Desrochers, 1980).

The dual coding theory explains picture superiority effect which refers to the fact that pictures are more likely to be remembered than words. Childers and Houston (1984) found that pictorial information were more quickly recalled than verbal information. Rossiter and Percy (1978) found that visually oriented advertising (a large picture of a product with small verbal copy underneath) had a significant impact on positive attitude toward a brand as compared to verbally oriented advertising (large verbal copy with a small picture of the product underneath).

The picture-superiority effect on memory is explained by visual imagery (Childers & Houston, 1984). Imagery refers to "a process by which sensory information is represented in working memory" (MacInnis & Price, 1987, p. 473) and is associated with multisensory imagery processing (i.e., sight, hearing, touch, taste, and smell). In particular, visual imagery processing has been known as

stimulating cognitive elaboration and increasing the likelihood that information will be remembered (Paivio & Foth, 1970). Imagery processing is facilitated by vivid and concrete sensory representations of feelings and memories. Research has found that concrete and vivid pictures are likely to facilitate visual imagery processing and to positively influence attitude toward a product or a brand and consumers' judgments about a purchase as compared to less concrete and vivid pictures or no pictures (Babin & Burns, 1997; Kisielius & Sternthal, 1984; MacInnis & Price, 1987). Similar to pictorial information, concreteness and vividness of verbal descriptions of an object may help shoppers visualize an object and activate imagery processing (Hong, Thong, & Tam, 2004). Research has found that concrete and vivid descriptions more effectively evoked images in individuals' mind as compared to abstract and no detailed descriptions (Rossiter & Percy, 1978; Unnava & Burnkrant, 1991). Based on the literature, the following hypotheses were proposed (See Figure 1).

H1 : Pictorial information associated with detailed views will evoke greater visual imagery than pictorial information associated with no detailed views.

H2 : Verbal information associated with detailed descriptions will evoke greater visual imagery than verbal information associated with abstract descriptions.

2. Visual Imagery and Mood

Mood refers to "an affective state which is transient and particular to a specific time and situation" (Jeon, 1990 cited as Park, Lennon, & Stoel, 2005, p. 699). Mood plays an important role in evaluating a situation and an object by serving as additional information (Barone & Miniard, 2002; Schwarz, 1986). People may think that their positive feelings are attributed to characteristics of an object, such as a product or a brand, and evaluate it favorably (Spies, Hesse, & Loesch, 1997).

Liu, Arnett, and Litecky (2000) found successful websites were enjoyable, exciting, and charming and attracted users to enjoy and visit the websites. In order to make effective shopping environments, retailers need to design store atmospherics which create positive mood and increase purchase intention (Kumar & Karande,

2000). Eroglu, Machleit, and Davis (2003) found that increasing site atmospheric qualities led to the high level of pleasure felt by online shoppers. One way to increase the quality of site atmosphere is providing effective product information, finally contributing to evoking consumers' positive mood and behavioral responses (Eroglu *et al.*, 2003). While consumers browse a website and search product information, perceived visual imagery is likely to influence consumers' positive mood. Inability to directly feel and use a product make visual imagery an important tool for obtaining positive emotion and gratification (MacInnis & Price, 1987).

Researchers have found that visual images related to product presentations (e.g., visual images with diverse angles of a product, mix and match, zoom-in and zoom-out) had a significant impact on mood. Park, Lennon, and Stoel (2005) found that people who are exposed to websites with products in motion exhibited positive mood as compared to people exposed to websites with products not in motion. Fiore (2002) and Fiore, Jin and Kim (2005) found that in online shopping, enhanced visual presentations (e.g., mix and match) and elaborated verbal descriptions (e.g., colorful stories about product features or experiences of the product users) influenced consumers' pleasure. Detailed and vivid images of a product and detailed descriptions of a product are likely to increase visual imagery by helping consumers recall their memories of past experiences in consuming and touching similar products. Since actual touch and consumptions are not available in online shopping contexts, high visual imagery is likely to be most useful as a substitute experience and increase consumers' positive mood and satisfaction. On the above understanding, the following hypothesis was developed (see Figure 1).

H3 : Visual imagery will be positively related to positive mood.

3. Visual Imagery and Perceived Product Quality

Consumer psychologists have studied the factors which influence consumers' perceptions of product quality and commonly divide product evaluative cues into two classes: intrinsic and extrinsic cues (Jacoby, Olson, & Haddock, 1971; Olson & Jacoby, 1972). Intrinsic cues refer to the product's inherent characteristics that cannot be manipulated without altering the physical attributes of the product itself, such as design or style, whereas extrinsic cues are defined as non-physical product properties that can be changed without altering the functional nature of the product, such as price, brand name or store name (Eckman, Damhorst, & Kadolph, 1990; Olson & Jacoby, 1971). Many studies on perceived product quality have used a single-item scale (Valenzi & Andrews, 1971; White & Cundiff, 1978). Several researchers have tried to use and develop multi-item measures of perceived product quality. Davis (1985) used a scale measuring perceptions of apparel quality in terms of construction quality, fabric quality, quality of the notions, quality of design, overall quality, fashionability, status and uniqueness. Eckman *et al.* (1990) identified four categories for assessing customer perceptions of apparel quality: (1) aesthetic criteria (e.g., color/pattern, styling, fabric, and appearance), (2) usefulness criteria relating to utilitarian concerns (e.g., versatility, matching, and appropriateness), (3) performance and quality criteria (e.g., fit, comfort, care and workmanship), and (4) extrinsic criteria (e.g., price, brand, and competition).

Perceptions of product quality are improved by distinctiveness of a product regarding increased price of a product, positive store image, and well-known brand names (Stone-Romero, Stone, and Grewal, 1997). Forsythe (1991) examined the effect of intrinsic and extrinsic cues on evaluations of apparel quality and found intrinsic cues (actual garment characteristics) are more important factors than extrinsic cues (brand names) in evaluating garment quality. In particular, when consumers evaluate product quality and perceive particular information about products as being missing, consumers tend to use visual imagery processing to fill in missing information about a product (MacInnis & Price, 1987). Apparel shoppers may want to obtain information about fabric hands and the fit of a garment by directly trying on it. In online shopping contexts, due to the lack of direct experience apparel shoppers are likely to infer the missing attributes of a product (e.g, fabric hands and a garment fit) based on existing information about the product. When consumers want to deal with missing

information, visual imagery processing is likely to be used to evaluate product quality as a decision making strategy (MacInnis & Price, 1987). Based on the review of the literature, the following hypothesis was developed (see Figure 1).

H4 : Visual imagery will be positively related to perceived product quality.

4. Mood and Perceived Product Quality

While processing and understanding information, consumers utilize emotions associated with a product or a brand and evaluate it regarding their affective responses (Ruth, 2001). When consumers are uncertain about evaluating product quality or are provided with an extensive amount of information, they tend to engage in selective processing of information. Under the product evaluation situation, positive mood is utilized as a source of information that sometimes replaces the evaluation of the product (Schwarz, 1990). Positive mood is attributed to characteristics of the product and thus the product is more positively evaluated. Gorn, Goldberg, and Basu (1993) found that people who were in positive moods evaluated a new product more positively than those who were in negative moods. Fiore (2002) emphasized that cognitive pleasure can be generated from experiencing in vivid imagery associated with aesthetic attributes (e.g., texture and color) of a textile or apparel product and is

an important factor in influencing attitude toward the product. Therefore, it is assumed that positive mood generated from visual imagery processing may increase consumers' perceived product quality. On the above understanding, the following hypothesis was developed (see Figure 1).

H5 : Positive mood will be positively related to perceived product quality.

### 5. Perceived Product Quality and Purchase Intention

Purchase intention refers to an intention of a consumer to purchase a product in a shopping situation. Past research has found relationships among perceived product quality and purchase intention (Boyer & Hult, 2006; Reichheld & Sasser, 1990). When consumers have positive perceptions of product quality, they are likely to purchase the product. Therefore, the following hypothesis was developed (see Figure 1).

H6 : Perceived product quality will be positively related to purchase intention.

III. Methods

1. Experimental Design

An experiment was conducted in a 2 (pictorial information: detailed views vs. no detailed views) x 2
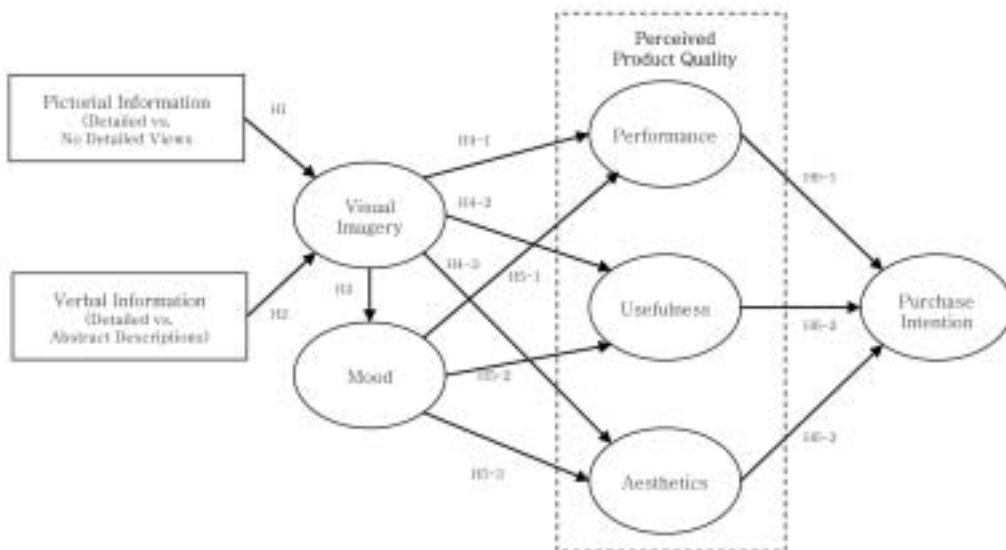
⟨Figure 1⟩ Theoretical Framework of the Study

(verbal information: detailed descriptions vs. abstract descriptions) between subjects design. The first pictorial information condition provided detailed views of a product (e.g., a larger view and close-ups of a product), while the other pictorial condition did not provided any additional detailed views of the product. All pictorial information conditions provided a basic picture of the product. Verbal information was also manipulated with product descriptions: the first verbal information condition provided detailed descriptions of fabric (e.g., softness, lightness, silkiness) and style (e.g., shape and fit), while the other verbal information condition provided descriptions of the product which are not related to fabric or style (e.g., care, country of origin). Both conditions provided basic information of the product (e.g., price, color, size).

2. Procedure and Sample

Each subject was randomly assigned to one of the four experimental conditions. Among apparel product categories, dresses were selected and two dresses were used in the main experiment. Before developing the manipulations, pretests were conducted with 50 female college students. Twenty pictures and fifty verbal descriptions of two dresses were evaluated and rated on visual imagery-evoking ability (imgery provoking/not imagery-provoking). On the basis of the results of the pretest, stimuli for product and verbal information were developed. Four mock apparel websites were developed regarding four different experimental conditions: detailed views/detailed descriptions, detailed views/abstract descriptions, no detailed views/detailed descriptions, no detailed views/abstract descriptions). A random sample of female college students who enrolled at a Midwestern university in the U.S. were the sample of this study. An invitation letter was emailed to a total of 2,200 female college students. The invitation letter explained the purpose of this study and a URL link which is connected to one of four experimental conditions.

3. Measures

Perceived visual imagery was measured by 4 items (i.e., imagery which occurred was vivid, clear, vague, weak) with 7-point Likert-type scales ranging from 1(strongly disagree) to 7(strongly agree). The four items were adopted from Ellen and Bone (1991)'s Communication-Evoked Imagery Processing scale. Mood was measured by assessing participants' feelings after browsing products. Three items (i.e., happy, delighted, joyful) applied 7-point Likert-type scales ranging from 1(strongly disagree) to 7(strongly agree). Perceived product quality was measured by assessing 14 attributes of a garment with 7-point Likert-type scales ranging from 1 (low quality) to 7 (high quality). Eckman *et al.*'s (1990) 14 criteria for women's general garment evaluations were used including color/pattern, style, fabric, uniqueness, appearance, versatility, matching, appropriateness, utility, fit, comfort, care, workmanship, and price. Three items of purchase intention were measured by using an item (i.e. I would purchase the dress which I evaluated) with 7-point semantic differential scales: 'unlikely-likely', 'improbable-probable', and 'impossible-possible' (Kwon, 2005).

IV. Results

1. Sample Characteristics

The total of 439 completed the questionnaire of the study (response rate = 19.95%) and 6 were eliminated because they contained many missing responses. Finally, 433 responses were used to test hypotheses. Participants' average age was 21 years. About 78% of the participants were Caucasian, followed by African American (7.2%), Asian (6.5%), and Hispanic (3.3%). The majors of participants were diversely distributed. Among various majors, Social and Behavioral Sciences (14.5%), Human Ecology (13.9%), Business (11.2%), and Medicine/Nursing/Optometry/Pharmacy (10.2%) represented high proportions of majors of participants. The participants for the four experimental conditions were 109 (detailed views/detailed descriptions), 107 (detailed views/abstract descriptions), 111 (no detailed views/detailed descriptions), and 106 (no detailed views/abstract descriptions).

2. Manipulation Checks

Manipulation checks were performed to examine if

participants perceived different experimental conditions as intended. Visual imagery-evoking ability of pictorial and verbal information was assessed. The results of t-tests found that there were significant differences between two conditions of pictorial information [$t(431)$ = 3.07, $p < 0.001$] and between two conditions of verbal information[$t(431)$ = 2.27, $p < 0.05$]. The mean for the detailed view condition (M = 5.07, SD = 1.36, N = 216) was significantly higher than that for the no detailed view condition (M = 4.66, SD = 1.43, N = 217). The mean for the detailed verbal descriptions (M = 5.01, SD= 1.40, N = 220) was significantly higher than that for the abstract verbal descriptions (M = 4.71, SD = 1.39, N = 213). Therefore, manipulations of pictorial information and verbal information were perceived as intended.

3. Validity and Reliability

Convergent validity was measured by confirmatory factor analysis (CFA) (Bagozzi, Yi, & Phillips, 1991). According to Anderson and Gerbing's (1988) two-step modeling approach, the measurement model was refined and respecified based on theoretical and statistical considerations. Several indicators were deleted because indications contained low factor loadings (e.g., lower than 0.60) and low squared multiple correlation values (e.g., lower than 0.40). Fit indices provided the evidence of goodness of the model. The CFA results revealed that the measures achieved convergent validity because all the t-values of path coefficients were significant ($p = 0.00$).

The overall fit of the measurement model was assessed. Although the significant chi-square statistic indicated the measurement model failed to fit the data in an absolute sense (x^2 = 207.98, df = 120, $p = 0.00$), it is sensitive to the large sample size (Bagozzi & Yi, 1988). Thus, other fit indices were considered and provided the evidence of the good overall model fit (RMSEA = 0.04, TLI = 0.98, GFI = 0.95, AGFI = 0.93). The CFA results revealed that the measures achieved convergent validity because all the t-values of path coefficients were significant ($p = 0.00$) (see Table1).

Chi-square difference tests were conducted to test

〈Table 1〉 CFA Results

	Standardized Item loading	Item loading	SE	$t-value$	Cronbach's α
Visual Imagery					0.76
Vivid	0.57	0.86	0.07	11.66***	
Clear	0.77	1.10	0.07	16.19***	
Vague	0.83	1.21	0.07	17.51***	
Mood					0.89
Happy	0.84	1.06	0.05	20.84***	
Delighted	0.89	1.15	0.05	22.46***	
Joyful	0.85	1.07	0.05	21.00***	
Perceived Product Quality					
Performance					0.83
Matching	0.74	1.00	0.06	17.22***	
Appropriateness	0.90	1.10	0.05	22.50***	
Utility	0.74	1.03	0.06	17.03***	
Usefulness					0.77
Fit	0.75	1.13	0.07	16.88***	
Comfort	0.80	1.00	0.06	18.41***	
Care	0.67	0.85	0.06	14.47***	
Aesthetics					0.86
Color/pattern	0.79	1.00	0.05	18.91***	
Style	0.91	1.15	0.05	23.26***	
Appearance	0.79	1.03	0.05	18.90***	
Purchase Intention (I would purchase the dress which I evaluated)					0.92
Likely/unlikely	0.91	1.80	0.07	24.23***	
Probable/improbable	0.98	1.85	0.07	87.68***	
Possible/Impossible	0.80	1.45	0.07	19.82***	

Note. ***$p < .001$.

⟨Table 2⟩ Chi-square Difference Test for Discriminant Validity

	Chi-square	df	Chi-square Difference	df Difference
Unconstrained model	207.984	120		
Constrained models[1]				
Visual Imagery & Mood	522.00	121	314.02***	1
Visual Imagery & PQ[2](Performance)	504.95	121	296.97***	1
Visual Imagery & PQ(Usefulness)	467.35	121	259.36***	1
Visual Imagery & PQ(Aesthetics)	503.06	121	295.08***	1
Visual Imagery & Purchase Intention	512.83	121	304.84***	1
Mood & PQ(Performance)	668.76	121	460.78***	1
Mood & PQ(Usefulness)	540.16	121	332.17***	1
Mood & PQ(Aesthetics)	761.40	121	553.41***	1
Mood & Purchase Intention	889.77	121	681.78***	1
PQ(Performance) & PQ(Usefulness)	286.36	121	78.37***	1
PQ(Performance) & PQ(Aesthetics)	457.53	121	249.55***	1
PQ(Performance) & Purchase Intention	671.47	121	463.48***	1
PQ(Usefulness) & PQ(Aesthetics)	361.35	121	153.37***	1
PQ(Usefulness) & Purchase Intention	524.33	121	316.35***	1
PQ(Aesthetics) & Purchase Intention	756.88	121	548.90***	1

Note. [1]A contrained model sets the correlation between two latent variables to 1.0.; [2]PQ = Perceived Product Quality ; ***$p < .001$.

⟨Table 3⟩ ANOVA Results for Hypotheses 1 and 2

Source	M	SD	N	MS	F (1, 429)	p	Partial η²
Pictorial Information				10.11	7.13	0.008	0.016
Detailed Views	5.09	1.16	216				
No Detailed Views	4.78	1.23	217				
Verbal Information				7.87	5.56	0.019	0.013
Detailed Descriptions	5.07	1.22	220				
Abstract Descriptions	4.80	1.18	213				

Note. Dependent Variable: Visual Imagery

whether each of the factor correlations was significantly different from unity by comparing between an unconstrained model and a constrained model which sets a correlation between two latent variables to 1.0. All the chi-square differences were significant, suggesting that perceived visual imagery, mood, perceived product quality (performance, usefulness, and aesthetics), and purchase intention were mutually distinct constructs. Reliabilities of the latent variables were achieved because all Cronbach's αs were bigger than 0.70 (see Table 1 and 2).

4. Hypothesis testing

Hypotheses 1 and 2 addressed the effect of pictorial and verbal information on visual imagery. The data were analyzed by using a 2 (pictorial information: detailed views vs. no detailed views) x 2 (verbal information: detailed descriptions vs. abstract descriptions) ANOVA

using SPSS. The ANOVA results revealed significant main effects of pictorial [$F(1,429) = 7.13$, $p < 0.01$] and verbal information on visual imagery [$F(1,429) = 5.56$, $p < 0.05$]. When people were exposed to detailed views of products ($M = 5.09$, $SD = 1.16$), they perceived more visual imagery than when they were exposed to a basic picture of products without any detailed views ($M = 4.78$, $SD = 1.23$). In addition, participants who were exposed to detailed product descriptions scored higher on perceived visual imagery ($M = 5.07$, $SD = 1.22$) as compared to those who were exposed to abstract product descriptions ($M = 4.80$, $SD = 1.18$). Therefore, hypotheses 1 and 2 were supported (see Table 3).

Hypotheses 3 through 6 addressed the relationships among visual imagery, mood, perceived product quality and purchase intention and were tested by performing structural equation modeling (SEM) analysis via AMOS.

Note. ***p < .001

〈Figure 2〉 Results for Hypotheses 3 through 6

V. Discussion and Conclusion

The present study investigated how different visual and verbal information formats influence consumers' perceived visual imagery in online shopping contexts. The study found that both pictorial and verbal information have significant effects on consumers' perceived visual imagery. Detailed views (i.e., larger view and close-ups of a product) and detailed descriptions (i.e., detailed descriptions of fabric and style) of a product played a significant role in evoking consumers' perceived visual imagery which subsequently enhanced positive mood and perceived product quality. The results were supported by previous research which studied on the effect of vividness or concreteness of pictorial information and/or verbal information (Babin & Burns, 1997; Kisielius & Sternthal, 1984; MacInnis & Price, 1987; Rossiter & Percy, 1978; Unnava & Burnkrant, 1991). Since detailed product and verbal information is perceived as being vivid and concrete, the information helps participants interpret the product images and thus stimulate visual imagery processing. The past research investigated the effect of pictorial and verbal information on recall, recognition and attitude toward a product or a brand, whereas the present study extended research on pictorial and verbal information into online shopping contexts and focused on the role of pictorial and verbal information in evoking visual imagery. The results of the present study further provide the evidence of dual coding theory regarding product information presentation in online shopping contexts. The dual coding theory postulates that two types of information are interconnected and independent when they are activated (Paivio, 1986). The study found that both pictorial and verbal information is effective in stimulating vivid visual imagery processing.

The study contributes to providing knowledge about product information for apparel e-retailers and website designers. While past research on imagery focused on theory building in psychology, the present study
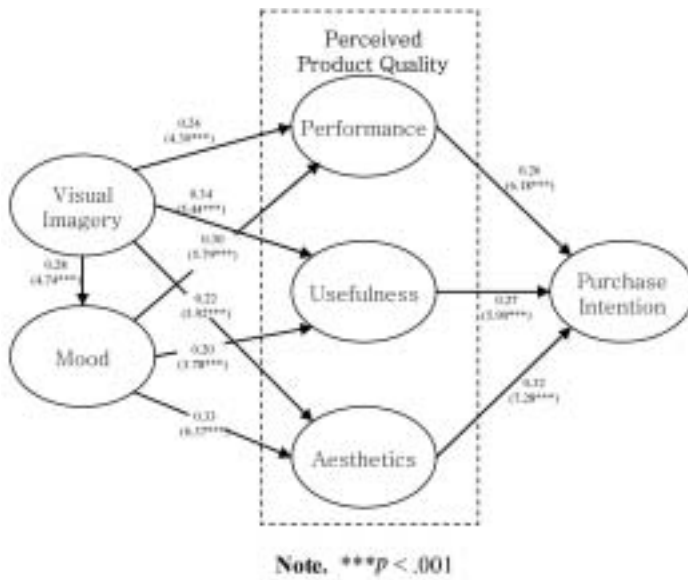
Fit indices suggested a good fit of the model (RMSEA = 0.04, TLI = 0.98, GFI = 0.96, AGFI = 0.93). Given the sample size it is not surprising to find a significant x^2 (x^2 = 169.61, df = 98, p = 0.00). The results of SEM analysis showed the path from visual imagery on mood was significant ($\gamma 1$ = 0.28, t = 4.74, p = 0.00), implying that the higher the perceived visual imagery evoked, the more positive mood generated. Thus, hypothesis 3 was supported. Path coefficients of the SEM also revealed the significant positive influences of perceived visual imagery on perceived product performance ($\gamma 2$ = 0.24, t = 4.30, p = 0.00), perceived product usefulness ($\gamma 3$ = 0.34, t = 5.44, p = 0.00), and perceived product aesthetics ($\gamma 4$ = 0.22, t = 3.92, p = 0.00). Therefore hypotheses 4-1 through 4-3 were supported. The results of the SEM also showed the significant positive effects of mood on perceived product performance (β_1 = 0.30, t = 5.79, p = 0.00), perceived product usefulness (β_2 = 0.20, t = 3.78, p = 0.00), and perceived product aesthetics (β_3 = 0.33, t = 6.37, p = 0.00). Thus, hypotheses 5-1 through 5-3 were supported. In addition, the results showed that perceived product performance (β_4 = 0.26, t = 6.18, p = 0.00), perceived product usefulness (β_5 = 0.27, t = 5.90, p = 0.00) and perceived product aesthetics (β_6 = 0.32, t = 7.28, p = 0.00) significantly and positively influenced purchase intentions. Therefore, hypothesis 6 was supported (see Figure 2).

provided more valuable and practical implications by testing the effect of pictorial and verbal information in online shopping situations which is close to real shopping contexts. Since the amount of product information immediately perceived by online apparel shoppers is limited, it is important to provide effective and detailed product information on screen. Larger views and close-ups of a product and detailed descriptions of fabric and style help apparel shoppers visualize a product and imagine fabric hands and fit of the garment without directly trying on and touching it.

The results from the present study also revealed evidence for the role of mood in affecting consumers' cognitive and behavioral responses. The more visual imagery people perceive, the more positive moods they experience, the more positively they evaluate product quality. Positive mood facilitated by good information and pleasant shopping environments was found to be important to increase favorable attitude and purchase intention and decrease perceived risk in online shopping (Park, Lennon, & Stoel, 2005; Park, Stoel, & Lennon, 2008). When consumers process product information and perceive risks of purchasing a product, mood plays a critical role in influencing the evaluation of product quality. Thus, to attract and keep more consumers, apparel e-retailers need to consider whether their websites provide sufficient and effective product information which evoking visual imagery and enhancing positive mood.

However, apparel e-retailers need to consider that advanced product presentations can be costly if the product presentation methods are associated with advanced web design systems and high-tech software programs. Based on the relationships between costs and revenues, e-retailers will need to consider whether the advanced product presentations can increase profitability and to decide whether to utilize them. In addition, the increasing volume and diversity of information tend to influence consumers' response to information load in online shopping (Huang, 2000). The high level of information complexity and diversity negatively influence product evaluations and purchase decisions. It is possible that information complexity and diversity can be enhanced by using diverse types of advanced product presentations(pictorial information) and the increased amount of product descriptions(verbal information). Participants with less experience may perceive advanced visual presentation of a product too complex, which will likely to lead to avoidance rather than approach responses. Since the amount of information which can be perceived by a consumer at a time is limited, the excessively increased amount of verbal descriptions may enhance perceived information load and negatively influence consumer's emotional, cognitive and behavioral responses. Thus, future research may need to focus on examining how perceived information load stimulated by advanced pictorial information and detailed verbal information of a product influences consumers' negative mood and perceived product quality.

Another interesting research avenue includes questions regarding other possible sensory imagery as it is stimulated by product information. The present study focused on visual imagery, but imagery is not limited to visual imagery. It is possible that apparel websites may be available to prompt haptic imagery, olfactory imagery and auditory imagery through detailed pictures and descriptions of a product. Thus, future research may need to examine whether product information evoke diverse types of sensory imagery in online shopping contexts.

Several limitations of the present study was acknowledged. The sample of the study (female college students) does not permit generalization of the results to all online apparel shoppers. Future research may need to prove the external validity of results by using samples from the general population. A mock website was designed and simulated instead of using real websites. By using the mock website, it was possible to carefully design experimental conditions (i.e., pictorial and verbal information conditions) and control other factors (e.g, brand names, prices, webpage backgrounds) that may influence participants' responses. However, it seemed that under the experimental situations participants were not highly motivated to search product information and purchase products. The future research may need to examine apparel purchasers under real online shopping situations.

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