[Original Article]

Does need for touch matter in the context of apparel online shopping?
- Compensatory role of online aesthetic and instrumental cues -

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Abstract

The purpose of this study is to examine the compensatory role of instrumental (e.g., product information) and aesthetic (e.g., website background) online cues presented within apparel websites where touch is unavailable. The moderating role of two need for touch (NFT) dimensions (i.e., autotelic and instrumental NFT) between online cues and consumer responses was also investigated. Results demonstrate that personal differences in autotelic and instrumental NFT moderate the relationship between online cues and affective responses. It was found that consumers high in autotelic NFT (i.e., who need to touch for fun) seek more instrumental cues to compensate for lack of touch when shopping apparel products online. Surprisingly, consumers high in instrumental NFT (i.e., who need to touch for product evaluation) use aesthetic as well as instrumental cues to supplement the absence of touch. In contrast, for the low NFT groups, only aesthetic online cues showed significant effects on consumer arousal. Further analysis shows that instrumental NFT is negatively related to purchase intention while autotelic NFT has a positive effect on purchase intention. This implies that need for hedonic-oriented touch is no longer a barrier for online apparel shopping. However, the instrumental NFT seems a significant obstacle for the adoption of online apparel purchasing.

Keywords: apparel online shopping, need for touch, affective responses, purchase intention

I. Introduction

In a physical store, touch plays a significant role in enhancing positive attitudes toward the store and influencing consumer's purchase behavior (Hornik, 1992). Unlike the traditional store setting, online shoppers are unable to utilize a tactile sense for evaluating products and such restriction has possibly affected their purchase decision. Previous research also emphasized the varied degree of shoppers' motivation to touch a product during the purchasing process (Citrin, Stem, Spangenberg, & Clark, 2003; Peck & Childers, 2003b). For instance, consumers high in need for touch (NFT) tend to use more haptic information in product evaluation because

touch is routinely more important for them (Cho & Workman, 2011). However, in an online shopping context, since touch is lacking, consumers primarily rely on visual information such as product description and images available in e-commerce sites. Therefore, when shopping online, shoppers high in NFT are likely to seek more feature by feature product information as the compensation for the lack of touch (Yazdanparast & Spears, 2012). This tendency may be greater for online apparel shopping (González-Benito, Martos-Partal, & San Martín, 2015) because apparel purchase requires greater level of tactile evaluation during the purchasing process.

According to Peck and Childers (2003b), written and visual depictions of products may serve to compensate for touch information. To supplement the deficit of online apparel shopping and to alter consumers' perception and attitude toward online stores, providing high quality (Lin, 2007) and sufficient amount of visual and verbal product information (Kim & Lennon, 2008) is essential. In addition, although website aesthetics do not convey actual tactile information, such non-haptic online cues may also serve as a compensation mechanism that minimizes or removes consumers' motivation to touch (Peck & Childers, 2003b). It is found that offering detailed product information along with pleasurable site aesthetics is liable to enhance consumer's perception of online store attributes and behavioral intentions (Childers, Carr, Peck, & Carson, 2001). Hence, examining the possible compensatory roles of both instrumental and aesthetic cues available in e-commerce website on consumer responses when touch is absent is necessary. In particular, understanding how the effect of such site cues on consumer responses differs as a function of individual variances in NFT is significant. Therefore, the purpose of this study is to advance our understanding of the consumer characteristic of NFT and its impact on online apparel purchasing behavior by examining the moderating effect of NFT in the relationship between various site

cues available in apparel websites and consumers' affective responses such as pleasure and arousal.

Ⅱ. Literature Review and Hypotheses

1. Instrumental and aesthetic site cues

Previous research has emphasized (Eroglu, Machleit, & Davis, 2001; Ha & Lennon, 2010; Kim & Forsythe, 2008; Oh, Fiorito, Cho, & Hofacker, 2008; Wu, Cheng, & Yen, 2008) significant effects of both instrumental and aesthetic site cues on consumers' affective responses such as pleasure and arousal. Kim and Lennon (2008) demonstrated that instrumental site cues such as verbal information and product pictures influence affective responses. Various aspects of ecommerce websites tend to increase pleasure and arousal in an online apparel shopping context as well (Ha & Lennon, 2010). Kim and Forsythe (2008) indicated that advanced product viewing methods minimize the uncertainties of online purchasing and increase the enjoyment of online shopping. Aesthetic features of a site are also found to influence consumers' affective responses. Websites containing both static and kinetic images may look more pleasing (Rowley, 2002) and consumers are likely to be entertained by the website atmosphere with pictures rather than texts (Oh et al., 2008). Website background color and music also show positive effects on consumers' pleasure and arousal (Wu et al., 2008).

2. Moderating role of need for touch

Online shopping research has underlined the potential moderating role of shoppers' lifestyle and personal variables (e.g., involvement, atmospheric responsiveness, motivation) in the relationship between online stimuli and consumer responses (e.g., Eroglu et al., 2001; Ha & Lennon, 2011). Related to touch, research has emphasized the significant role of individual differences in tactile information processing and its possible impact on online shopping behavior (Cho & Workman, 2011; Park, Hill, & Bonds-Raacke,

2015; Yazdanparast & Spears, 2012, 2013). The NFT, defined as "a preference for the extraction and utilization of information obtained through the haptic system" (Peck & Childers, 2003a, p.431), is a person's motivational difference in touch. Peck and Wiggins (2006) revealed that individual differences in NFT moderate the relationship between the information provided in a message and consumers' affective responses. A touch element provided in the message increases positive affective responses for people high in NFT. However, for those low in NFT, the message with the touch element has no significant impact on affective responses.

3. Compensatory role of website cues

Due to the lack of NFT research in the context of online shopping, direct evidence showing whether individual differences in NFT moderate the effect of site cues on consumer affective responses is unavailable. However, based on previous findings and the assumption that consumers who are high in NFT are highly motivated to access tactile information, consumers high in NFT possibly seek more product information to compensate for the inability to touch in an online shopping context than those low in NFT. When touch is unavailable, instrumental product information (e.g., weight) compensates high NFT consumers for the lack of physical touch (Peck & Childers, 2003b). Previous research proved that in the online shopping context, high NFT consumers are more likely to use feature by feature product information (e.g., sleeve length, design detail, color options, etc.) compared with low NFT consumers when considering a product for purchase (Yazdanparast & Spears, 2012). Therefore, detailed product information may create positive affective responses for those high in NFT, particularly in a context where touch is absent. On the other hand, touch element presented in a message has no effect on affective responses and persuasion for those low in NFT (Peck & Wiggins, 2006). This tendency implies that low NFT consum-

ers may not necessarily search for instrumental information to substitute for the lack of touch in the context of online shopping because they are not highly involved with touch in product evaluation. Instead, the absence of aesthetic cues would increase low NFT consumers' frustration (Peck & Childers, 2003b).

4. Instrumental and autotelic NFT

Peck and Childers (2003a, 2003b) also highlighted two NFT dimensions: instrumental vs. autotelic. Both groups are sensitive to touch but for different motivations. The instrumental dimension of NFT relates to goal-oriented touch to obtain information about a product. Consumers high in instrumental NFT engage in pre-purchase touch to make better judgments about a product before purchase. In contrary, the autotelic dimension of NFT corresponds to hedonic aspects of touch. Consumers high in this dimension need to touch a product for fun, arousal, and enjoyment, without intention of purchasing and seek more sensory experience through touch. Thus, autotelic processing is more spontaneous and instinctive in nature, while instrumental processing is more conscious and controlled (Peck & Childers, 2003a). Grounded on the justification above, compensatory effect of different online cues for touch is expected to be different for instrumental NFT vs. autotelic NFT. Therefore, the following hypotheses were developed.

H1. *Individual difference in autotelic NFT will moderate the effects of product information and website color on consumers' affective responses.*

H2. *Individual difference in instrumental NFT will moderate the effects of product information and website color on consumers' affective responses.*

5. Effects of affective responses on cognitive and behavioral responses

Affective responses are immediate emotional re-

actions (e.g., pleasure and arousal) to store or online cues (Eroglu et al., 2001; Olney, Holbrook, & Batra, 1991; Zajonc & Markus, 1982). Whereas cognition is an internal mental state (Eroglu et al., 2001) that can be measured by attitude, beliefs, perception, and thoughts structured in consumers' minds while exposed to such cues (Eroglu et al., 2001; Holbrook & Batra, 1987) and therefore, more related to rational responses. Due to this reason, affective responses need to be changed to alter cognitive responses in determining consumer preference and its apparent shopping behavior (Zajonc & Markus, 1982).

Previous research confirms that affective responses such as pleasure, arousal, and excitement influence cognitive responses such as store image and attitude (Eroglu, Machleit, & Davis, 2003; Olney et al., 1991; Sherman & Smith, 1987) and behavioral intention (Ha & Lennon, 2010; Hu & Jasper, 2006; Wu et al., 2008). A high level of pleasure and arousal elicited by store or e-commerce sites enhances store image perceived by consumers (Sherman & Smith, 1987) and increases a positive behavioral intention (Ha & Lennon, 2010; Eroglu et al., 2003). Previous research (Yazdanparast & Spears, 2013) confirmed that positive mood yield greater purchase intention in an apparel online shopping context. Store image developed based on the evaluation of various store attributes such as merchandising, accessibility, service, and store atmosphere influences consumer preference for the store (Thang & Tan, 2003). Researchers have noted that perceived store image is a significant contributor to store patronage (Darley & Lim, 1999; Pan & Zinkhan, 2006) and purchase intention (Van der Heijden & Verhagen, 2004; Kim, Ju, & Johnson, 2009). Based on above considerations, the following hypotheses were formed.

> **H3.** *Consumer affective responses will positively influence online store image that in turn influence behavioral intention.*

Ⅲ. Method

1. Procedure

The study employed a 2 (NFT: high vs. low)×2 (instrumental cue: high amount product information vs. medium amount product information)×2 (aesthetic cue: chromatic background vs. achromatic background) between-subjects factorial design. Four mock apparel websites that varied in the amount of product information and site background color were created. To replicate real apparel websites, the mock websites contained at least a medium amount of product information. To test for a moderating effect of difference in need for touch, the sample was divided into low and high NFT groups.

A total of 1585 US adult online consumers participated in the study. Participants were randomly assigned to one of four websites and asked to complete the survey after browsing the website. The survey questionnaire was composed of items measuring need for touch, perceived online store image (i.e., product quality, website design, convenience, price/value), and purchase intention.

2. Measures

Six pleasure and six arousal items were measured using 7-point semantic differential scales (Mehrabian & Russell, 1974). The store image measure was adapted from Chowdhury, Reardon, and Srivastava's (1998) study. Since the measure was developed in the context of the traditional retail store, items in each section were modified and/or removed to be more applicable in an online shopping context. In the final questionnaire, 12 items were used to measure four different dimensions of perceived online store image; product quality, convenience, atmosphere, and price/value. Purchase intention items included three items (Park, Lennon, & Stoel, 2005). The 12-item Need For Touch (NFT) measure including 6-autotelic and 6-instrumental NFT items was adapted from Peck and Childers (2003b). Examples include "touching prod-

ucts can be fun" for autotelic NFT and "I place more trust in products that can be touched before purchase" for instrumental NFT. To test H1 and H2 (i.e., a moderating effect of autotelic and instrumental NFT), 6 items representing each NFT dimension were summed. Then, the sample was divided into low vs. high autotelic NFT groups for H1 and instrumental NFT groups for H2 based on a median split. All items used 7-point scales and basic demographic information including age, academic standing, and ethnicity was collected.

Ⅳ. Results

1. Confirmatory factor analysis

A confirmatory factor analysis (CFA) was conducted to evaluate and purify measures. The initial measurement model was respecified based on the result of the CFA (Anderson & Gerbing, 1988). Two arousal indicators were removed from the initial model due to low squared multiple correlations (lower than .5) (Bagozzi & Yi, 1991). The final model was assessed in terms of convergent validity, unidimensionality, and discriminant validity. Significant t-values of all path coefficients (λs=.60-.96, p<.0001) and squared multiple correlations (between .52 and .91) greater than .5 supported convergent validity (Anderson & Gerbing, 1988; Bagozzi & Yi, 1991). Fit indices (RMSEA=.053, NFI=.96, GFI=.95, AGFI=.93) were within acceptable ranges. In addition, average variance extracted (AVE) for each latent variable was larger than the .50 critical value and greater than any of its squared correlation with other constructs sup-

porting the evidence of reliability and discriminant validity (See Table 1) (Fornell & Larcker, 1981).

2. Invariance of measurement model over groups

In order to estimate mean differences of latent constructs across groups in Hypotheses 1 and 2, the invariance of the model form and factor loadings for different experimental groups must be established (Bollen, 1989). A series of multiple-group structural equation modeling (SEM) showed that all experimental groups had the same model form and the same factor loadings (See Table 2). Thus, the model form and factor loadings were set equal across groups in Hypotheses 1 and 2.

3. Hypotheses testing

Hypotheses were tested using AMOS 16. To assess the moderating effects of autotelic (H1) and instrumental (H2) NFT on the relationship between website cues and consumers' affective responses, the sample was split into high vs. low NFT groups based on a median split (Autotelic: $Med.$=33, $Min.$=6, $Max.$=42, Instrumental: $Med.$=32, $Min.$=6, $Max.$=42). A series of multi-group SEM was conducted for H1 and H2. The estimated means of the group with the high amount of product information and with chromatic background are interpreted as the mean differences in pleasure and arousal between the two NFT groups. Fit indices for the models in H1 and H2 were within acceptable ranges (See Tables 3 and 4), indicating a good fit of the models. In the case of prod-

<Table 1> Squared correlations and AVEs of latent constructs

Latent constructs	Pleasure	Arousal	Online store image	Purchase intention
Pleasure	.63[a]			
Arousal	.22[b]	.51		
Store image	.41	.12	.51	
Purchase intention	.15	.12	.32	.76

Note. [a] Average variance extracted (Diagonal elements), [b] Squared correlation.

<Table 2> The results of testing the invariance of the measurement model

Hypotheses	RMSEA	CFI	Chi-square	df	Chi-square difference ($\triangle\chi^2$)	Status
H_{form} (Same model form across groups)	.053	.933	1,802.017	326		Hold
$H_{\Lambda x}$ (Same Λ_x across groups)	.052	.933	1,823.911	341	$H_{\Lambda x}-H_{form}$=21.895 ($\triangle df$=326−341=15)	Hold
$H_{\Lambda x\Theta\delta}$ (Same Λ_x and Θ_δ across groups)	.051	.933	1,894.472	361	$H_{\Lambda x\Theta\delta}-H_{\Lambda x}$=70.561[***] ($\triangle df$=361−341=20)	Not hold

Note. [***] $p<.0001$

uct information, the mean difference in pleasure was significant for the high NFT groups (both autotelic and instrumental) but not significant for the low NFT groups. The mean difference in arousal was not significant for all groups. For website color, the mean difference in pleasure was significant only for thehigh instrumental NFT group. No significant effect on pleasure was found for other groups. The results also showed the significant effect of website color on arousal for the low NFT groups (both autotelic and instrumental). Thus, H1 and H2 were partially sup-

ported (See Tables 3 and 4).

H3 was tested using the single group SEM. The model included four latent constructs (pleasure, arousal, store image, and purchase intention) with 25 indicators. Results showed an acceptable fit of the proposed model (χ^2=821.127, $p<.0001$, RMSEA=.061 [.057; .065], NFI=.95, GFI=.94, AGFI=.92). All standardized path coefficients for the measurement model (λs=.61-.95, $p<.0001$) were significant. Both pleasure (γ=.60, t=18.75, $p<.0001$) and arousal (γ= .09, t=3.20, $p<.001$) positively influenced consumer's

<Table 3> Estimated means of pleasure and arousal for autotelic NFT groups (Hypothesis 1)

		High autotelic NFT group		Low autotelic NFT group	
		Pleasure	Arousal	Pleasure	Arousal
Product information	Medium amount (n=406)	0	0	0	0
	High amount (n=439)	.243 (.066)[a] 3.689[***b]	.020 (.069) .296	.060 (.064) .950	.039 (.063) .612
	Chi-square (χ^2)	RMSEA	CFI	NFI	
Product info (high/low autotelic NFT):	1095.17[***]/942.19[***]	.049/.045	.95/.94	.92/.91	
Site background	Achromatic (n=421)	0	0	0	0
	Chromatic (n=424)	.095 (.065) 1.473	.096 (.068) 1.405	.089 (.063) 1.417	.169 (.062) 2.746[**]
	Chi-square (χ^2)	RMSEA	CFI	NFI	
Site background (high/low autotelic NFT):	1,046.04[***]/983.78[***]	.048/.047	.94/.94	.91/.91	

Note. [a] Standard error, [b] t-values; [*] $p<.05$, [**] $p<.01$, [***] $p<.001$

\<Table 4\> Estimated means of pleasure and arousal for instrumental NFT groups (Hypothesis 2)

		High instrumental NFT group		Low instrumental NFT group	
		Pleasure	Arousal	Pleasure	Arousal
Product information	Medium amount (*n*=410)	0	0	0	0
	High amount (*n*=412)	.166 (.066)[a] 2.503[*b]	.002 (.068) .024	.109 (.062) 1.750	.050 (.063) .796
	Chi-square (χ^2)	RMSEA	CFI	NFI	
Product info (high/low instrumental NFT):	1,052.31[***]/1,031.93[***]	.049/.048	.93/.94	.90/.92	
Site background	Achromatic (*n*=405)	0	0	0	0
	Chromatic (*n*=417)	.152 (.066) 2.304[*]	.100 (.067) 1.493	.041 (.062) .665	.170 (.026) 2.722[**]
	Chi-square (χ^2)	RMSEA	CFI	NFI	
Site background (high/low instrumental NFT):	1,042.97[***]/1,093.21[***]	.048/.050	.94/.94	.90/.91	

Note. [a] Standard error, [b] *t*-values; [*] *p*<.05, [**] *p*<.01, [***] *p*<.001

perceived online store image, which in turn positively affected purchase intention (β=.58, *t*=21.01, *p*<.0001). Therefore, H3 was supported. The further analysis (i.e., bootstrapping) revealed that confidence intervals of the indirect effect of pleasure (CI=(.319, .390), *p*<.005) and arousal (CI=(.023, .089), *p*<.01) on purchase intention did not include zero, implying that the effect of pleasure and arousal on purchase intention is indirect through perceived online store image.

4. Post-hoc analyses

Additional analysis was conducted to see whether individual differences in NFT have direct effect on purchase intention. Citrin et al. (2003) demonstrated that consumers' need for tactile input negatively influenced online purchasing behavior and this effect is strong for products requiring physical examination for product evaluation. Because it has been more than a decade since Citrin et al.'s (2003) study was conducted, it is worthwhile to check if this norm remains the same in current years. Multiple regression analysis revealed that autotelic NFT was positively related to

purchase intention (β=.263, *t*=8.567, *p*<.0001), while instrumental NFT was negatively related to purchase intention (β=−.317, *t*=−10.316, *p*<.0001).

V. Discussion and Implication

Although the lack of touch in online apparel shopping significantly influences shoppers' purchase decision (Yazdanparast & Spears, 2013), research in the area of need for touch (NFT) and its impact on online apparel shopping remains comparatively underinvestigated. The current study provides insight into the compound interrelationship between autotelic and instrumental NFT and consumers' responses toward ecommerce site cues. Particularly, this study highlights the compensatory role of both instrumental and aesthetic site cues for different NFT groups.

Consistent with previous research (Peck & Wiggins, 2006) tested the moderating effect of NFT in the context of print media, the results of the current study demonstrate that personal differences in autotelic and instrumental NFT factors moderate the relationship

between online aesthetic/instrumental cues and consumer's affective responses in the context of online apparel shopping. As expected, instrumental online cues such as product pictures and descriptions had a significant effect on consumer pleasure for high NFT groups. Since pre-purchase touch is critical for both high autotelic (i.e., touch for fun) and instrumental (i.e., touch for better judgment) NFT groups, they are likely to pay more attention to product information to compensate for lack of touch in the case of apparel online shopping. This result is consistent with previous research by Yazdanparast and Spears (2012). In contrast, only website aesthetics had a significant effect on arousal for low autotelic and instrumental NFT groups who are not sensitive to touch. This suggests that only non-haptic site cues such as background color play important role for online shoppers with low NFT since touch is not important for them. Therefore, lack of aesthetic online cues may negatively influence consumers low in NFT.

Post-hoc analysis further reveals that instrumental NFT is negatively related to purchase intention while autotelic NFT has a positive effect on purchase intention. The results imply that need for hedonic-oriented touch is no longer a barrier for online apparel shopping. On the other hand, the instrumental NFT seems a significant obstacle for the adoption of online apparel purchasing. Thus, providing better online services and environment for those who are high in instrumental NFT is utmost important to reduce the uncertainty about their purchase and consequently to make their purchase decision easier. Interestingly, the current study found that online shoppers high in instrumental NFT (i.e., who engage in pre-purchase touch to make better judgments) used both aesthetic (e.g., background color) and instrumental (i.e., product information) online cues to supplement the absence of touch in the online apparel shopping context. Therefore, using various non-haptic online cues such as background images and colors along with a sufficient amount of product information may be necessary to

enhance consumers' pleasure that in turn increase their perceived online store image and purchasing.

To reduce shopping cart abandonment and increase online purchase, understanding consumers' personal differences and their relation to decision making is important. In particular, this study provides valuable insights for online retailers who sell experienced goods such as clothing because pre-purchase touch is essential for this type of products. Since tactile information is critical for clothing products, individual differences in NFT may have a greater impact on online shoppers' information seeking tendency and consequently their purchase decision. In general, apparel shoppers are fairly sensitive to touch (Yazdanparast, & Spears, 2013) and this sensitivity is higher for those highly involved in fashion and women (Workman, 2010). Thus, developing a website that compensate for lack of touch may be more important for online apparel retailers selling fashionable items than those selling basic items. To attract and provide appropriate services to consumers with different demographic and psychographic characteristics, online retailers may first need to understand their interests and needs. Web analytics and surveys can help online retailers understand consumers and segment them accordingly. Based on the segmentation, online retailers may recognize consumers' sensitivity to touch. Personalized site design and information (e.g., personalized website color, mix and match suggestions, product descriptions, close-up views of color/fabric swatches) may help online retailers attract customers with different needs and expectations. Today, more online shoppers expect personalized services which better fit their taste and preference. Personalized shopping experience may increase consumer satisfaction as well as retailers' success. Further research needs to investigate the compensatory effect of personalized online services on consumer responses and behavioral intention. Touch may be less important for some clothing articles such as basic t-shirts, therefore it is also essential to know how individual differences in NFT influences consum-

ers' decision making with different clothing categories and even different product categories.

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