

The Influence of the Nature of Need for Touch, Handcraft Material and Material Color on the Motivation for Touch

Si-Jing Chen¹, Chih-Long Lin², and Chiu-Wei Chien¹

¹ Graduate School of Creative Industry Design, National Taiwan University of Arts, Ban Ciao City, Taipei County 22058, Taiwan

² Crafts and Design Department, National Taiwan University of Arts, Ban Ciao City, Taipei County 22058, Taiwan

{Jing0503,Chiewei}@gmail.com, CL.Lin@ntua.edu.tw

Abstract. The main purpose of this research is to investigate the effect of user characteristic – the need for touch (NFT), handcraft materials and material colors on motivation of touch and preference. A total of 70 subjects were recruited in the study. In addition to the NFT level (high score group and low score group) was evaluated, handcraft materials (wood, glass, pottery, plastic and metal) and material colors (red and yellow) were studied in the experiment. The dependent variables including the willingness of touch, preference and 16 pairs of opposite adjectives for sense of sight were measured by questionnaire interview. The study results showed that the effect of NFT affect significantly willingness of touch ($p < 0.001$), preference ($p < 0.01$) and the sense of warm-cold ($p < 0.05$). All measures were affected significantly by handcraft material effect ($p < 0.05$). On the other hand, 11 pairs of opposite adjectives are affected significantly by material color factor. The results of regression equations showed that the willingness of touch was mainly affected by subjective preference. Moreover, the subjective preference was mainly affected by the rating of beauty for product. Therefore, the subjective preference increased for a product was followed the rating of beauty and then the willing of touch was increased. The findings of this study can give an insight into the motivation of touch, and further provide some guidelines and recommendations about the product design and selling method to increase the competitive advantage of product.

Keywords: motivation of touch, need for touch, sense of vision, preference.

1 Introduction

In recent years, the rising of online, TV and catalog shopping is due to convenient. The visual or hearing information of product is presented with image or sound on media. However, it is difficult to show the haptic information like texture, softness, weight of product on screen or catalog. An inability to physically examine products would decrease consumers' confidence before purchase. Holbrook [1] pointed out it is difficult to evaluate some product especially for sweaters by picture, because subjects

strongly depend on tactile feedback. Thus, more and more studies about marketing and product design areas pay attention to haptic experience influence on consumers' behavior and purchase decision.

The product properties including texture, softness, weight, and temperature would affect haptic experience [2, 3]. The touch behavior is different for different product. The more product property is needed to evaluate, the more motive is acted to touch the product before purchase. For example, towels differ from texture and weight will cause touch more prior to purchase than cans or bottles, which material attributes are similar. Peck and Childers [7] videotaped the hand motions of subjects while they verbalize during product evaluations at the same time. The study results showed that the behavior and oral report was correspondence. Moreover, the touch time was longest for sweater or tennis racket evaluating which product properties varied most, followed by calculator or cell phone evaluating which product properties varied somewhat, and the touch time was shortest for cereal or toothpaste which didn't need to evaluate product properties. Further, haptic experience could be compensated even touch is unavailable. McCabe et al. [4] indicated that the differences in preference between the environment where allow physical examine and the environment where touch is not feasible were reduced when the product properties were verbally described. Peck and Childers [6] also concluded that a written description about product properties on brochure could compensate for lack of touch.

In addition, there is an individual difference in the preference for haptic experience. A Need for Touch (NFT) concept brought up by Peck and Childers [6] is defined as consumer's preference and motivation for the obtainment and utilization of information through touch. Then a 12-item scale which including two dimensions, an instrumental and an autotelic dimension was developed to reveal the different goal-directed touch behavior between purchase-directed and enjoyment-directed. Peck and Childers [6] found that confidence of consumers higher in NFT before purchase was less while physical examine is unavailable during product evaluation. On the contrary, the confidence in evaluation was not affected for low NFT consumers only there was an obvious image of the product. In a related study on compensation of untouchable situation, Peck and Childers [5] found that for high NFT subjects, a written description could compensate functional tactile information, like heaviness, but not compensate pleasant sensory property, like softness. On the other hand, for Low NFT subjects, they could extract information through visual cue instead of actual haptic exploration. Furthermore, subjects high in autotelic NFT made more impulse buying than low autotelic NFT subjects while tryout activities were offered in a grocery store [8].

Most early researches used functional or useful product as stimuli to evaluate the effect of subjects' NFT or material property on touch behavior and purchasing attitude. However, the result of using beautiful yet functionless things as stimuli is less discuss. Moreover, it is also worth to find out what kind of sense play an important role to active touch motivation. Therefore, the main purpose of this research is to investigate the effect of user characteristic – the nature of need for touch, handcraft materials and material colors on subject's motivation of touch and preference.

2 Methods

2.1 Subjects

Twenty-one men and forty-nine women participated in the experiment as paid volunteers. All participants were Taiwanese and free from any known musculoskeletal disorders. The mean age was 20.8 (sd=1.08) years.

2.2 Experiment Design

This study employed a nested factorial design. The independent variables included the degree of nature of need for touch (NFT) (high score group and low score group), handcraft materials (wood, glass, pottery, plastic and metal) and material colors (red and yellow). The subject was a random factor. There were a total of ten experiment conditions for each subject. Ten sample items, as illustrated in Fig. 1, were evaluated. The size of each sample was 10*10*10 cm cube. The degree of NFT was measured using the 12-item scale [5]. Scale item descriptors ranged from -3 (strong disagree) to +3 (strong agree) with the entire range represented in the sample. Higher and lower NFT were determined by a median split, with subjects scoring at or above the median (a score of 14 in the study) classified as high NFT (thirty-five subjects) and those scoring below the median classified as low NFT (thirty-five subjects). Due to the limitation of material itself, the color of each sample was made as similar as possible.

Three different kind dependent variables were measured in the study. They were willingness of touch (5-point scale, with 1 for “I really don’t want to touch it”, 3 for “normal feeling”, 5 for “I really want to touch it”), preference(5-point scale, with 1 for “I really don’t like it”, 3 for “normal feeling”, 5 for “I like it very much”) and 16 semantic scales, defined by polar-opposite adjectives for sense of sight were measured by questionnaire interview. A 7-point Likert scale was applied on these opposite adjectives. A higher score indicates a more sense of ugly, sensibility, plain, ancient, boring, cold, popular, inelegant, wild, heavy, artificial, hard, male, peace, dark, and reserve. A lower score indicates a more sense of beautiful, sense, gorgeous, modern, interesting, warm, individuation, elegant, mild, light, nature, soft, female, excited, bright, and extroverted.

2.3 Experiment Procedure

Experiment was conducted under normal day light illumination. Before the experiment, the researcher explained the purpose and procedure to the subjects. After that, one sample was placed in front of subjects at a time. They watched the sample item 10 seconds and then were asked to assess subjective willingness of touch, preference and 16 pairs of opposite adjectives questionnaire based on its visual appearance without tactile interaction. The 10 treatment combinations were randomized for each subject and completed within 30 minutes.



Fig. 1. The sample items were used in this study. The upper row samples are red color and lower row are yellow color samples. The sample materials from left to right are wood, glass, pottery, plastic (acrylic) and metal (copper).

2.4 Data Analysis

Analysis of variance (ANOVA) was performed to analyze the NFT group, handcraft materials and material colors effect on willingness of touch, preference and sense of sight. Post hoc testing with the Duncan multiple range test ($\alpha=0.05$) was then performed to identify significant differences within handcraft materials factor. Moreover, regression analysis with a forward stepwise procedure was conducted to construct two prediction models for willingness of touch and preference with independent factors including: gender, NFT group, handcraft materials, material colors, preference and adjectives of sense of sight. The significance level was set $\alpha=0.05$.

3 Results

3.1 ANOVA Results

Analysis of variance (ANOVA) was performed to evaluate the need for touch, material colors and handcraft materials effects. The need for touch effect was only significant on the Willingness of touch ($F_{1,68}=31.98$; $p < .001$), Subjective preference ($F_{1,68}=11.82$; $p < .001$) and the sense of Warm-Cold ($F_{1,68}=4.55$; $p < .05$). Moreover, the material color factor showed significant effect on eleven opposite adjectives questions. The handcraft material effect was significant on all measures. For two-way interactions, the handcraft materials and material colors interaction effect was significant on nine of the eighteen response measures which were Willingness of touch, Subjective preference, Sense-Sensibility, Gorgeous-Plain, Modern-Ancient, Mild-Wild, Light-Heavy, Nature-Artificial, Bright-Dark.

Tables 1 present the mean values of measures for the independent variables. The Willingness of touch for high NFT score group (3.46 scores) was significantly greater than that for low NFT group (3.02 scores). Similarly, the Subjective preference was also greater for high NFT score group (3.35 scores) than low group (3.10 scores).

There was only one of the 16 bipolar adjectives (warm-cold) were rated as significantly different; the subject high NFT has warmer feeling than who low NFT. The NFT developed by Peck and Childers includes two dimensions, an instrumental and an autotelic dimension. The instrumental dimension means that touch behavior is purchase goal-directed and the autotelic dimension is enjoyment goal-directed (Peck and Childers 2003b). The average score of autotelic dimension for high NFT group is 8.86 and greater than low NFT group (6.29 score). It could be the reason the motivation of touch for high NFT group is still stronger than that for low NFT group, even the experiment sample is functionless.

Both of the measurements of Willingness of touch and Subjective preference were not significantly affected by material color effect. However, the subjects' feel were partial to gorgeous, modern, boring, individuation, elegant, wild, heavy, artificial, female, dark, and reserve while watching red color samples. For yellow samples, the sense were partial to plain, ancient, interesting, popular, inelegant, mild, light, nature, male, bright and extroverted.

The Duncan grouping results indicate that the Willingness of touch for the handcraft material can be classified into three groups. The first group, with the highest willingness was for wood and pottery material, followed by plastic, metal and glass. While watching wood and pottery samples, the subjects rated about 1.5 score higher Willingness of touch than watching glass sample. Besides, the subjective preference can be classified into two groups. The higher preference group included wood and pottery samples. While watching wood and pottery samples, the feeling of beautiful, sensibility, plain, ancient, warm, popular, elegant, nature, female, peace, and reserve were higher than watching other materials. On the contrary, the sense of sign under plastic or glass samples watching were partial to ugly, sense, gorgeous, modern, cold, artificial, excited, bright, extroverted etc.

3.2 Regression Analysis

This study obtains two regression models using a forward stepwise searching procedure (Table 2). Results show these models to be statistically significant ($p < .001$) with the coefficient of determination (R^2) 0.47 for predicting Willingness of touch and 0.52 for predicting subjective preference. Moreover, the standardized partial regression coefficient of the subjective preference is 0.45, greater than that of the sense of Beautiful-Ugly (0.25), the sense of Mild-Wild (0.11), and the sense of Light-Heavy (0.08). Subjective preference influence seems greater than other factors regardless of the handcraft material or color factor. Increase in subjective preference, the sense of beauty, the sense of mild, and the sense of heavy followed by an increase in the Willingness of touch. On the other hand, the subjective preference was mainly affected by the senses of beauty, individuation, peace and warm for a product. Therefore, the subjective preference increased was followed the rating of beauty and then the willing of touch was increased.

Table 1. Measurements under affect levels of each independent variable

	Need for touch		Material color		Handcraft material				
	Low	High	Red	Yellow	Wood	Pottery	Metal	Plastic	Glass
Willingness and preference									
Willingness of touch	3.02	3.46	3.28	3.21	3.52^a	3.54^a	3.16^b	3.01^b	2.99^c
Subjective preference	3.10	3.35	3.27	3.18	3.40^a	3.47^a	3.14^b	3.11^b	2.99^b
Opposite adjectives (1 point – 7point)									
Beautiful – Ugly	3.79	3.65	3.66	3.78	3.51^b	3.27^b	3.88^a	3.99^a	3.96^a
Sense – Sensibility	4.11	4.03	4.10	4.04	3.94^b	4.78^a	3.60^c	3.96^b	4.06^b
Gorgeous – Plain	4.20	4.25	4.07	4.38	5.41^a	4.87^b	3.75^c	3.45^c	3.64^c
Modern – Ancient	4.28	4.51	4.31	4.49	5.53^a	4.75^b	4.44^c	3.44^c	3.83^d
Interesting – Boring	4.24	4.27	4.45	4.06	4.62^a	3.84^c	4.79^a	3.92^b	4.11^b
Warm – Cold	4.13	3.83	3.94	4.01	3.31^d	3.61^c	5.16^a	3.69^c	4.10^b
Individuation – Popular	3.94	3.79	3.68	4.05	4.14^a	4.09^a	3.52^b	3.86^{ab}	3.71^b
Elegant – Inelegant	3.80	3.71	3.64	3.87	3.72^b	3.24^c	4.21^a	3.84^b	3.76^b
Mild – Wild	4.42	4.65	4.80	4.27	5.01^a	4.18^b	5.17^a	4.13^b	4.16^b
Light – Heavy	4.26	4.21	4.38	4.08	3.89^c	3.14^c	4.84^a	4.81^a	4.48^b
Nature – Artificial	4.17	4.27	4.31	4.13	3.29^c	3.10^c	5.60^a	4.52^b	4.57^b
Soft – Hard	4.61	4.82	4.76	4.67	4.44^c	3.99^c	5.76^a	4.68^b	4.73^b
Female – Male	3.88	3.89	3.74	4.04	3.91^b	3.45^d	4.64^a	3.64^{cd}	3.80^{bc}
Excited – Peace	4.06	4.29	4.15	4.20	4.95^a	4.54^b	4.55^b	3.01^d	3.84^c
Bright – Dark	3.82	3.71	4.07	3.47	4.47^a	3.55^b	4.31^a	2.79^c	3.72^b
Extroverted – Reserve	4.14	4.23	4.37	4.00	5.02^a	4.48^b	4.66^b	2.89^d	3.88^c

a, b, c: Duncan grouping code; Bold indicates significant differences between levels of a factor for that measure.

Table 2. Regression equations for Willingness of touch (WT) and Subjective preference (SP)

Equation	R ²	Significance
WT=1.73+ 0.45SP-0.25(Beautiful-Ugly)-0.11(Mild-Wild)+0.08(Light-Heavy)	0.47	p< .001
SP= 3.09- 0.60(Beautiful-Ugly)-0.14(Individuation-Popular)+0.13(Excited-Peace)-0.13(Warm-Cold)	0.52	p< .001

4 Conclusion

The objective of study is to investigate the effect of the degree of need for touch, material colors and handcraft materials on subject’s motivation of touch, subjective pre-

ference and polar-opposite adjectives for sense of sight. The main findings are that both of the motivation of touch and subjective preference were significantly affected by need for touch and handcraft materials. Increase in subjective preference, the sense of beauty, the sense of mild, and the sense of heavy followed by an increase in the Willingness of touch. The findings of this study can give an insight into the motivation of touch, and further provide some guidelines and recommendations about the product design and selling method to increase the competitive advantage of product.

Acknowledgement. The authors would like to thank the National Science Council, Taiwan, R.O.C. for financially supporting this research under Contract No. <99-2218-E-144-002->.

References

1. Holbrook, M.B.: On the importance of using real products in research on marketing strategy. *Journal of Retailing* 59(1), 4–23 (1983)
2. Klatzky, R., Lederman, S.: Stages of manual exploration in haptic object identification. *Attention, Perception, & Psychophysics* 52(6), 661–670 (1992)
3. Klatzky, R., Lederman, S.: Toward a computational model of constraint-driven exploration and haptic object identification. *Perception* 22, 597–621 (1993)
4. McCabe, D.B., Nowlis, S.M.: The effect of examining actual products or product descriptions on consumer preference. *Journal of Consumer Psychology* 13(4), 431–439 (2003)
5. Peck, J., Childers, T.L.: Individual differences in haptic information processing: The “need for touch” scale. *Journal of Consumer Research* 30(3), 430–442 (2003a)
6. Peck, J., Childers, T.L.: To have and to hold: The influence of haptic information on product judgments. *The Journal of Marketing* 67(2), 35–48 (2003b)
7. Peck, J., Childers, T.L.: Self-report and behavioral measures in product evaluation and haptic information: Is what I say how I feel? *Advances in Consumer Research* 32(1), 247 (2005)
8. Peck, J., Childers, T.L.: If I touch it I have to have it: Individual and environmental influences on impulse purchasing. *Journal of Business Research* 59(6), 765–769 (2006)