Product Pleasure Enhancement: Cultural Elements Make Significant Difference

Tyan-Yu Wu

Chang Gung University, The department of Industrial Design,
Tao-Yuan, Taiwan
tnyuwu@mail.cgu.edu.tw

Abstract. The aim of this paper is to examine the following arguments: 1) Products embedded with cultural elements have a greater chance to evoke a consumer's pleasure response than ones without; 2) A consumer perceiving the meaning of a cultural product in advance has a greater chance to evoke his/her pleasure than the one without perceiving; 3) Electromyography (EMG) is able to objectively assess consumers' pleasure evoked by a product. In this paper, EMG signal activity was collected as women (n=60) were exposed to three different stimuli. The results revealed that a product with cultural elements, (e.g. pictographic patterns) has a greater chance to evoke participants' pleasure than the one without. It also demonstrated that a consumer, perceiving a product's cultural meaning ahead of time have a stronger pleasure response than those without perceiving the meaning advance. The result shows that pleasant products are able to elicit greater activity over zygomaticus major.

Keywords: Emotional design, Facial Electromiography, Cultural product.

1 Introduction

Emotions play an important role in product design [1], [2], [3], [4]. Consumers, nowadays require a product not only to provide functional and ergonomic satisfaction, but also to fulfill users' pleasure status when interacting with a product [4]. Particularly, when a product is involved a decent cultural meaning, it can elicit users' pleasure if the meanings attached to a product are understandable.

A product with local appeal appears is becoming an important component for the development of a successful product [5]. For example, in 2007 Alessi cooperated with Taipei's National Palace Museum for the development of a series of kitchenware objects including pepper and salt shakers, cooking timer and egg holder. These designs patterned a powerful image of the Chin dynasty emperor and turned out to become very unique cultural products. These products communicate emotional semantics, which derive from remembered experience, including social experience and interpreted experience [6], memory of Chinese history. So, the product acts as an agent [3] of evoking users' pleasure when connecting to users' wonderful memory or experience during conversation. Hence, to create a product with pleasure, a designer should understand that, beside functions and usability, the cultural meaning is

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equalized important in designing a product for pleasure [7]. However, the lack of an empirical study in this aspect has lead to this paper. This paper aims to prove that a product patterned with cultural elements has a greater chance to evoke a consumer's pleasure response than the one without.

Product with cultural contents can enhance a user's pleasure after he or she comprehends the meaning of its particular form [8]. In fact, comprehension of product meanings involves users' cognition and previous experiences. This means the cognitive process and experience may affect the way users value the objects around them. In this paper, we argue that a consumer should have a pleasure response great, if they perceive the meaning (e.g. content, context, historical value or semantic meaning) of a product "positively". Hence, we assume that participants receiving a product's cultural meaning in advance (i.e. by watching a film related to the meaning of product) should have a greater influence on their pleasure responses than participants who do not perceived ahead of the time. In this paper, differently, we exclude traditional self-report and purpose to use Electromyography (EMG) as a tool because of its objective matter and success in evaluating positive and negative emotions in the base of facial muscles reactions.

2 Cultural Products Can Elicit Emotion

All aspects of human life are influenced by culture [9]. In fact, products with cultural form which we use in the daily life can be something with social meaning. In which can best fit the social belief systems, values and custom contexts [10], [8]. Hence, products can convey a strong information/ meaning [11], in certain cases about the human being who owns it [7]. For instance, by enforcing cultural value and emphasizing user's identity, Swatch conveys something personal; their products just about trendy colors or matching to various outfits, but say something about the personality of the wearer, which somehow make users feel pleasant.

Through product semantic content and expression, owning a product can affect a users' positive (i.e. strengthen the role) or negative (i.e. weaken the role) perceptions, emotion, value and associations [12]. From a user's point of view, decoding symbolic qualities of artifacts involves the cognitive and social context of their use [13]. As known, users from different culture have different cognitive and social context may strengthen or weaken users' social context and cognition, which affect their perception towards the product value and further evoke their pleasures. For instance, a product with Chinese elements can convey a stronger association, imagination, and interpretation to a Chinese viewer (e. g. Taiwanese participants) and further evoke a greater emotional response. Hence, to indicate users' emotion intensity involves their capabilities in translating/decoding artifact meaning in the product. In this paper, we assumed that a consumer watching a film related to product meaning advance can reveal greater pleasurable response than the one without watching. Additionally, to measure positive emotion, researchers have been particularly interested in facial EMG measures of activity over zygomaticus major, which pulls the corners of the mouth back and up into a smile, and corrugator suercilii, which draws the brow down and together into a frown[14], [15].

3 Method

Sixty Chang Gung Junior College female students (Ave. age = 17.5) took apart the test. They were divided into two groups: thirty for controlled and another thirty for experimental groups. Three physical stimuli were used in the experiment. Among these three, both S3 (i.e. pepper and salt shakers) and S2 (i.e. ice block lamp) demonstrate a strong pleasure, while S1 repeated S3, but without patterns on. In the experiment, MP 150, Biopac system was employed to catch EMG facial signals.

Procedure: Participants were asked to seat on a comfortable chair with relaxed gestures. Electrodes were fixed to the subjects to capture facial signals. In experimental group, two films were displayed before observing real stimuli, S2 and S3. The experiment was started with a 20-s calm period (i.e. preparation phase); then, participants were asked to watch the physical stimuli (S1) appeared for lasting 20-s. After the observing of S1, continuously ice scenario film was played on the screen and, after the film stopped, S2 was displayed in front of participants for another 20-s. Continuously, last process was repeated on S3. Repeat the same process experimental group gone through in controlled group. The only difference is that the films input sections were controlled and omitted.

Data acquisition: EMG signals were collected and transform into digital data. The EMG signals were submitted to a 20-Hz low pass and 500-Hz high-pass filter to reduce movement and blink-related artifact, then full-rectified. Following Larsen et al. (2003), EMG reactivity was measured during the first 6000-ms stimulus period and the 1000-ms immediately prior to stimulus on set. Total of measured period was 7000-ms. All data were subjected to a root mean square (RMS) transformation. EMG values were normalized to enable comparison of the values of two groups of each subject. Normalization formula is shown as $N = \overline{X} / \overline{P}$. Where $\overline{X}$ is the signal in the 6000-ms (i.e. after stimulus displayed) + 1000-ms (i.e. before stimulus displayed). $\overline{P}$ is the signal in the any 7000 ms before exposure of S1 (i.e. among 20s of calm period at preparation phase).

4 Results and Discussions

Control group: In Table 1, a repeated measure of general linear model was used to test three stimuli. In the activity of zagomatic major, a significant differences were found in three stimuli ($F=3.17$, $p= .05$). The result of zagomatic major signal activity demonstrates that participants can distinguish the difference significantly among S1, S2, and S3. Extensively, through paired test, the result of the signal activity of zagomatic major shows that both S3 and S2 elicited higher signal activity than S1 in zagomatic major activity (see Table 1-1,). It implied that pepper and salt shakers (i.e. S3) patterned cultural elements has a greater impact than pepper and salt shakers (i.e. S1) without cultural elements. In sum, the result implied that products attached with culture elements/ meaning have a greater influence on participants' pleasure responses than the one without.

Table 1. Statistic result of EMG value from Zagomatic major, elicited by three stimuli (Controlled group) (n=26)

Source	SS	df	MS	F	*P*
S1, S2, S3	.78	2	.39	3.17	.05*
Bet.-Sub.	12.80	25	.51		
Error	6.16	50	.12		
Total	19.66	77			

Table 1-1. Paired test of EMG value from Zagomatic major, elicited by three stimuli (Controlled group) (n=26)

(I) Real stimulus	(J) Real stimulus	MD (I-J)	Error	*p*
S1	S2	-.14*	.06	.03*
S2	S3	-.10	.09	.30
S3	S1	.24	.12	.06

Note: S3(Mean=1.07) >S2(Mean=.97) > 1(Mean=.83)

Experimental group: In Table 2, a repeated measure of general linear model was utilized to test three stimuli along with watching a film. In the activity of zagomatic major, a significant differences were found in three stimuli (F=4.26, $p< .02$). The result in zagomatic major signal activity demonstrates that participants can distinguish the difference significantly among S1, S2, and S3. Furthermore, in the Table 2-1, paired test result shows that S3 has higher signal activity than S1 does significantly in zagomatic major. However, there is no significant different between S2 and S1, although the mean of S2 has higher signal activity than the mean of S1 does. The result of this paper supported the theory, that people find pleasure and meaning in the use of their eyes and have delighted in them, when the product content has associated with history and in every known culture [16].

Table 2. Statistic result of EMG value from Zagomatic major, elicited by three stimuli (Experimental group) (n=26)

Source	SS	df	MS	F	*P*
S1,S2,S3	36.03	2	18.02	4.26	.02*
Bet.Sub	244.36	25	9.78		
Error	211.45	50	4.23		
Total	491.84	77			

Table 2-1. paired test of EMG value from Zagomatic major, elicited by three stimuli (Experimental group) (n=26)

(I) Real stimulus	(J) Real stimulus	MD (I-J)	Error	*p*
S1	S2	-.65	.42	.130
S2	S3	-1.00	.59	.10
S3	S1	1.65*	.68	.022*

Note: S3(Mean=2.50) >S2(Mean=1.49) > S1(Mean=.84)

In table 3, to identify the effect derived from the cultural element, independent-samples T test was carried out to exanimate the effective difference between watching film in experimental group and without watching film in controlled group. In the examination of signal activity between two groups, △S2 and △S3 represent the value derived from the enhancement of watching film in experiment group and △S2' and △S3' represent the value without watching film in controlled group. In which EMG values were normalized by △S2= $\overline{S2}$ - $\overline{S1}$, △S3= $\overline{S3}$ - $\overline{S1}$, △S2'= $\overline{S2}$' - $\overline{S1}$' and △S3'= $\overline{S3}$' - $\overline{S1}$'.

Table 3. Independent-Samples T Test between Experimental and Controlled Group

	△S2 & △S2'						△S3 & △S3'					
	Mean	F	Sig.	t	df	Sig.(2-tailed)	Mean	F	Sig.	t	df	Sig.(2-tailed)
EG	.65	5.73	.02*	1.21	50	.23	1.69	15.98	.00*	2.01	50	.05*
CG	.14						.24					
Note: " * " indicates significant, EG= Experimental Group (n=26), CG= Controlled Group (n=26)												

Moreover, independent-samples t test was conducted to test the effective between experimental and controlled groups. The result shows that there is a significant

difference (F=15.98, p=.00) between △S3 & △S3'. Consistently, between △S2 & △S2' also demonstrated a significant difference (F=5.73, p =.02). The results implied that participants' pleasure towards product have a greater influence by their perceptions of watching films in both S2 and S3. In accordance of means, the result indicates that S3 carried out with Chinese cultural element/ meaning, in which Taiwanese participants can associate with their cultural root more and further may evoked a greater pleasure response, while S2 carried out with less familiar scenario (e.g. icy images) which reduced participants' imagination and further resulted in less pleasure response. The result explained why the cultural experience may influence a viewer's perception to a product, particularly when a product carried out a strong cultural meaning.

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