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The study of tactile feeling and It's expressing vocabulary

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ABSTRACT

Tactile feeling is an important sense of people's use of products in our daily life. However, how people express and verbalize their tactile feeling has hardly been systematically studied. Thus, the purpose of this study is to investigate how people describe their tactile feeling and how this expression will be affected by visual experience. To achieve the purpose a focus interview was conducted for this study. A set of 51 samples of various textures based on a literature review and a pilot study was prepared as reference stimuli in the interview to evoke respondents' tactile feeling and experience. Six blind and 5 blindfolded respondents were recruited for the interview. In each interview session the respondent was guided and encouraged by the interviewer to exhaustively describe his/her tactile feeling on freely touching the reference samples only, without the aid of vision. The Kawakita Jiro method (KJ method) then was used to sort, classify and analyze the collected vocabularies of tactile feeling. The results showed that the expressed vocabularies of tactile feeling can be classified into five dimensions: "objective/measurable", "evaluative/aesthetic", "social status and positions", "emotional" and "interface quality". Among them, vocabularies of "objective/measurable" and "interface quality" were the most frequently mentioned by respondents, while those of the "evaluative/aesthetic" were the least. The expressed vocabularies between the blind and the blindfolded respondents were also found to be significantly different in the five dimensions.

Relevance to industry: The results of this study can help researchers to further understanding tactile feeling and help designers in selecting appropriate vocabularies of tactile feeling to express in their product designs.

1. Introduction

With increasing emphasis being given to product emotion, designers no longer have a need to satisfy only functional requirements, but also to meet emotional needs as well (e.g. Cardello and Wise, 2008; Malnar and Vodvarka, 2004; Schifferstein and Desmet, 2008; Van Egmond, 2008). However, most of the emotion design approaches in the past focused on product appearance, through which emotional appeal was achieved. Although the visual sense is the primary channel for absorbing information from the outside, recent researchers have pointed out that other senses (such as the tactile sense) are also important or are even more important factors during a product experience. For example, according to the research conducted by Schifferstein (2006), the relative importance of the different senses is determined by the product type. When visually evaluating and judging the quality of a lamp, the visual sense may be the most important sense; when sensing perfume, the sense of smell is the most important; when using a hand tool, the tactile sense is the most important. Even, the tactile feeling can affect the manipulation of hand-held object (Jones & Piateski, 2006; Kilbreath et al., 1997; Augurelle et al., 2003; Cadoret & Smith, 1996).

The majority of product uses are operated through physical contact with products. Hence, the tactile sense is generally considered as the most important, while the visual sense has a key influence only when the consumer makes a product purchase. According to the research conducted by Millar and Tesser (1986), when the consumer's overall evaluation of a product is formed through a direct experience, a higher emotional evaluation will be produced. Breckler and Wiggins (1991) also believe that the more product-related direct experiences the consumer has, the higher his acceptance toward product recognition, emotion, and image will be. The tactile sense is often people's direct product experience. The importance of the tactile sense affecting people's purchase behaviors was found in Peck and Childers's investigation on the tactile sense in decision-making (Peck and Childers, 2003, 2006).

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The importance of the tactile sense in product design has been recognized over time. Relevant researches have also been conducted as a result, many of which focus on investigations of the relationship between touch and material, or investigations of materials and feelings of materials through the three senses; the tactile sense, the visual sense, and the mixed senses (visual sense and tactile sense). For instance, Heller (1982) explored the feeling of materials through the visual and tactile sense. Hollins et al. (1993) on the other hand conducted investigation on materials felt through the tactile sense. Picard et al. (2003) studied people's descriptions of tactile sensations of common textures from memory based on tactile stimuli. Picard (2006) investigated the perceived visual sense and tactile sense of texture, which served as a basis for research on equal (equivalent) material information. Karlsson and Velasco (2007) investigated the relationship between surface structure and preference, etc. These researches generally explored tactile sense experiences through emotional wording. It was found that the emotional vocabulary used for the tactile sense in these researches was mostly collected from relevant literature, newspapers, and magazines. Then, through experts or focus groups, screening and filtering were done to obtain the vocabulary instead of directly obtaining first-hand information from the user. Thus, the emotional vocabulary used usually has a similar framework and scope. The vocabulary acquired through these methods can accurately and comprehensively describe the tactile sense experience, however, lead to some common questions, too. First, where has the emotional vocabulary originated? Have the vocabularies been collected and compiled based on the tactile sense related characteristics rather than borrowing from other senses (visual sense)? Also, do they fully cover the tactile sense experiences, and have they been systematically organized and classified? Furthermore, according to numerous relevant researches, a sensory experience is interactive (Katz and Krueger, 1989; Klatzky et al., 1993; Kosslyn, 1994; Reisberg, 1992). For example, the visual experience will influence tactile expressing and tactile experience will create an expected of visual expression on product colors (Dagman et al., 2010). For most people, when expressing a sensory experience, their visual sense experience has an effect on the tactile sense experience, and the visual sense experience usually dominates. Therefore, past researches only targeted regular people (individuals with normal vision), thus whether or not the implementation of research on tactile feelings to evaluate the tactile feelings can be steered clear of the visual sense experience is yet to be verified. At present, researches on this aspect are not available.

Thus, in this study we want to systematically investigate how people describe their tactile feeling and how this expression will be affected by visual experience. Then through systematic compilation and classification on data a more accurate and all-around tactile sense related emotional vocabulary will be constructed to serve as a reference for follow-up research. On the other hand, Karlsson (1996) indicated that congenitally blind people can use the sense of touch to make up their visual sense function in getting information from real world. This phenomenon of making up for the deprived visual sense of blind individuals through their tactile sense is called sensory compensation (Kuo, 2007). Thus, to see how this phenomenon of sensory compensation affects the expression of tactile feeling this study also proposed to compare the differences in tactile sense experiences of blind and sighted respondents.

2. Method

To achieve the purpose of understanding how blind and sighted people express and verbalize their tactile feeling and how this expression will be affected by visual experience a focus interview was adopted in this study as the main data collection method. The respondents in this focus interview were individuals with a keen tactile sense so that they could express their tactile sense experiences easily and clearly, including blind individuals and sighted individuals with a keen tactile sense, such as sculptors.

The tactile sense experiences of the totally blind, the half blind, and those with congenital and acquired blindness vary. The research of Monegato et al. (2007) on comparing the effects of congenital and late visual impairments on visuospatial mental abilities showed congenital blindness could process visuospatial more efficiently than acquired blindness. This implied that congenital blindness had better ability on sensory compensation than acquired blindness. Furthermore, individuals with acquired blindness may still retain memories of their visual experience. Therefore, the totally blind individuals with congenital blindness are mostly suitable for the blind respondents in this study. However, since the born blind individuals are comparatively rare, the congenitally blind individuals or individuals became blind at a young age were selected as blind respondents in this study. On the other hand, sighted individuals who relied on their keen tactile sense at work, such as modelers, sculptors, or material designers, were selected as sighted respondents in this study.

In the research process, the interview outline and script were first developed. Then pre-test interviews were conducted on 3 respondents: two totally blind individuals and one blindfolded individual with a keen tactile sense. The interview content included items designed to: 1. understand the importance and significance of the tactile sense for individuals with a keen tactile sense; 2. understand the items and characteristics of the vocabulary used to express and describe the tactile sense; 3. understand how the interviewees touch a given material on exploring it; 4. determine the materials corresponding to various tactile feelings; and 5. determine the characteristics of the preferred tactile feelings. Based on the pre-test interview results, the researcher modified the interview outline and script for use during the formal interviews. It was also found from the interview results that without any prompts or references as stimuli, it was difficult for the respondents to express their perceived tactile sense. Hence, in accordance with the pre-test interview results and literature reviews, 51 tactile sense stimuli with different physical characteristics, as shown in Fig. 1, were collected as prompts for the formal implementation of the focus interviews in order to elicit the respondents' expressions of their perceived tactile impressions. Except for the stimuli of special materials such as bamboo which is cylindrical and other natural materials which retained their natural shapes, the remaining stimuli were set as the size of a piece of A4 paper (210 mm × 297 mm).

Under the condition that the visual sense was excluded, the formal interviews of the tactile sense stimuli were implemented using 6 individuals with total blindness and 5 blindfolded individuals with a keen tactile sense. The interview process was divided into two stages as follows.

1. The respondents were requested to describe and share their tactile sense experiences, according to the interview outline. This part was conducted for approximately 1 h. Voice and video recording were used to record the respondents' dialogs, intonation, and facial expressions. The recordings were then used for transcript compilation and content analysis.
2. With the stimuli samples as an aid, the respondents were requested to mention their tactile sense and association for every stimuli sample. In this interview stage, the respondents with normal vision wore goggles in order to obscure their vision. As the tactile sense may have included perceived cold and heat, the temperature of the interview room was maintained at 27 °C.