



A conceptual network analysis of user impressions and meanings of product materials in design

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ABSTRACT

This paper focuses on tactile interactions with product materials to approach the essence of users' interaction. We propose a framework for analysing tactile interactions based on users' association-based in-depth impressions and interpretation-based created meanings. The aim of the study is to determine how in-depth impressions activate created meanings in tactile interaction and how they affect users' preferences with regard to product materials. To detect and identify in-depth impressions and created meanings, this study applies original methods that analyse concept networks. To collect users' freely expressed impressions and preferences, we conducted an experiment that involved seven material samples. The identified in-depth impressions and created meanings are connected with preference evaluations during a tactile interaction with product materials. According to the findings, the generation of fewer yet affect and abstraction-based in-depth impressions produces high-preference evaluations and gives rise to diverse created meanings with respect to a material. These findings should contribute to designs that lead users to form emotional bonds and gain meaningful experiences with products.

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1. Introduction

This paper pays attention on products that are expected to correspond with human impressions [1,2]. Professionals involved in product design must provide designs according to users' sensorial perceptions, emotions, and product experiences [3–7]. In previous studies, sensorial perceptions, emotions, and experiences have been conceptualised as components of users' impressions of a product. Many attempts have been made to understand the impressions that products generate, but most fail to grasp the changing nature of such impressions.

1.1. Tactile interaction

Tactile user-material interaction has been recognised as a prominent topic in experiencing man-made objects [3,4,8]. It is important for designers to develop methods and a conceptual framework for the tactile sensory experience, particularly with respect to product materials. It has been suggested that an approach can be based on cognitive and perceptual learning [3, p. 62]. How-

ever, product design practices do not yet offer such tools and methods.

The issue of the provision of methods for analysis of tactile sensory experience is related to understanding the formation of users' sensory experiences and providing an effective approach to assessing this experience. In product design, designers have to understand how user impressions of materials are formed. Furthermore, an effective assessment approach (technology) would contribute to the development of products and materials by fitting the products to expected tactile experiences (various products with which users interact everyday).

People interact with various materials, perceive various characteristics of these materials, manifest different affects from these materials, and create different meanings from the materials [8], ultimately accumulating experiences and building bonds with, attachments to, or dislike of products. Previous studies have shown that the users' impressions of materials in tactile interactions depend on how accustomed they are to the materials and how natural the materials are perceived to be [9].

Recent work on tactile experience, with respect to product materials, has represented these experiences using systematic approaches to the materials' sensorial properties [10]. The findings of this work show that the meanings are attributed to materials depending on factors, such as meaning type, material type, the product, its usage, and the user's background. Tools for facilitating material selection on the basis of these findings have been developed [8].

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