Exploring and teaching tactility in design

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Introduction

Communication is one essential part of design and can be defined as an exchange of information. Information is related to concepts like meaning, knowledge, representation and mental stimuli.[1] What a product means to us has to do with the awareness and understanding of information gained through the senses.
Traditionally focus has been on visual perception of products. Lately emphasis has been drawn to the sense of touch and the body as perceivers of information, especially in the area of design for pleasure, inclusive design and interaction design.
In addition companies are using designers to create stronger emotional connections with their customers. One way to do this is to emphasize the characteristics of materials, surface structure and the sense of touch.
This paper investigates how to develop and expand the awareness of tactile perception in the education of designers. It describes and discusses the outcome of a 6 ETCS course called Tactility in design, held by the authors for students at Oslo School of Architecture and Design during the spring semester 2006. Some of the student's works are presented and discussed.

Part 1 - The sense of touch

Tactility as ability to touch and being touched

Tactility is the capability of being touched or of responsiveness to stimulation of the sense of touch. Tactility is based on a physical contact with the surroundings via the senses of the skin. The ability to touch is one of the most basic abilities of a living organism. In a newborn touch assures security, comfort and trust and these are feelings we seek later in our lives. The most important tactile experience we gather in early childhood and it is related to strong emotional moments in our lives. Like all the other senses tactility inform us about the surrounding, prevents our body from direct danger, contributes to the exploration of an object, but most important it can give us the feeling of safety and pleasure.[2] This strong emotional impulse we get from tactile sense is what makes it so attractive and important for human life.

The somatosensory system mediates the sense of touch

The word tactile originates from Latin tactilis, which means to tangere, to touch.
The sense of touch is mediated by the somatosensory system**.** Touch may simply be considered one of five human senses; however, when a person touches something or somebody this gives rise to various feelings: the perception of pressure (hence shape, softness, texture, vibration, etc.), relative temperature and sometimes pain. Thus the term "touch" is actually the combined term for several senses.[3]

This system mediates four types of perception.[4]
Tactile perception is defined as perception mediated solely by variations in cutaneous stimulation.
Kinesthetic perception is defined as perception from joints and muscles, by limb movement alone, of hardness, viscosity and shape.
Proprioception is the sense of position of the body in relation to gravity as well as our movement through space. Receptors in the vestibular apparatus are involved.
Haptic perception is defined as perception in which both the cutaneous sense and kinesthesis convey significant information about distal objects and events.
Haptic system unifies input from many sources, e.g., position of fingers, pressure, into a unitary experience.

The haptic sense is the most complex in mechanism and least understood

The term haptics in its broadest sense relates to the study of touch and the cutaneous senses. The word itself derives from the Greek *haptikos*, able to touch. The haptic senses may be categorised in a number of ways. Most obviously we have those active tactile senses generally associated with the concept of touch, with which we 'feel' and interact directly with our external environment. Our hands are clearly key locations for this group of senses.

These haptic senses link most closely with the kinaesthetic senses, the brain's awareness of the position and movement of the body by means of sensory nerves within the muscles and joints. However, of all the senses, haptics are undeniably the most complex in mechanism and least understood, yet in many ways are the most fundamental. [5]

Dreamy and intelligent hands

The tactile experience can be divided into two aspects: Intelligent and rational; and dreamy and emotional.[6] Intelligent and rational experience is the immediate response user gets when he first comes to the physical contact with an object. It is based on physical qualities like: shape, size, texture, weight, balance, temperature and material properties. The rational information about the product then creates an affective response to the product, which involves previous associations with similar experiences and emotions connected to them. This is Dreamy and Emotional experience. The process of evaluating tactile experiences is mostly unconscious; however we are strongly aware of its results. For example while choosing a new sofa, we know which one feels more comfortable, but many times we do not know what cause our decision.
Although our body is very sensitive to the environment we many times are not reading its signals and do not have vocabulary to describe tactile experiences we have especially during the interaction with an object. Users adjust to the product and designers are focused on visual aesthetic without paying sufficient attention to the tactile perception. However the emotional effect from a tactile experience is stronger then from visual. And this is because visual perception is connected to the tactile perception. When we see wooden surface we already know how it will feel from previous experience, so the emotional response will be the same from looking on the wood or touching it. So the wooden surface looks good because we know it feels good. That leads us to the conclusion that the tactile perception is a very important part of visual aesthetic of the product and should be fully explored during the design process.

Part 2 – Teaching tactility

Tactility in design at AHO

Little is known about the tactile aspects of the users' experience of products, and how designers should deal with these aspects within design projects. But it has a big potential and can give another dimension to design.

A course called Tactility in design was held in the spring 2006 at the Oslo School of Architecture and Design. The aim of the course was to develop and expand the awareness of tactile perception of designers. In this course the students had to focus on the tactile aspects of products and make reflections on its relations to the total experience of the product.

Their tasks were:

- Define and make arguments for areas where tactile qualities play or could play an important role in the experience of the product.
- Explore the differences in the tactile elements of design.
- Compare and contrast the tactile qualities in products
- Analyze and evaluate tactile characteristics in products, suggest new methods.
- Develop ideas for improving products by identifying, synthesizing and reflecting upon tactile elements.

The course was divided into three parts: A practical and explorative one where the students were asked to choose a theme or area they where interested in and want to investigate, describe it and explain and argue for their chose. A second part where they had to find relevant literature connected to their theme read it and make a resume. In the final part they made presentations of their result in an exhibition.
The students were allowed to work in groups of two persons. 24 students fulfilled the course.

The result of the course

We would like to highlight five students' works which illustrate the connection between tactile and visual experience. You will find them on the posters.

An explorative "blind" game with textiles
Kristian Steinskog Sørnes and Joachim Sørensen

The result of their work was an experimental setup. A box was constructed where you could touch ten different types of "hidden" textiles. The textiles were also represented by visual images at photos. The task was to connect the visual images with the hidden textile you only could touch.

A "perfect" coffee cup based on tactile experiences and a user trial
Sigrun Vik and Lena Zuk

Five coffee cups were tested by users. The best characteristics from the five cups where put together in a new cup. A 3D model was constructed.

Tactility as a part of the total experience of business cards
Kristine Five Melvær and Daniel Rybakken

Seven business cards were tested with six persons. They were asked to answer some questions. First they were only alloud to touch the cards without seeing them. Then they saw the cards and finally they were asked to compare the tactile and visual impressions. A new test was presented and the task was to connect a profile, a visual expression and a tactile impression.

Using the wine vocabulary to describe the tactile experience of wooden surfaces
Erik Meyer
He asked himself if it was possible to describe the tactile experience from a wooden surface. Inspired by descriptions of wine he tried to develop a vocabulary.

A haptic puzzle
Snorre Hjelseth og Erik Horn
Starting with screwdrivers they ended up with a Haptic puzzle, a brilliant concept for a pedagogic toy and a table game.

Further work

There are many directions to go. What would you recommend?

To

- develope principles and guidelines for different tactile experiences?

- study how haptic and visual experiences are connected and what kind of implications may this have for product designers?

- develope a vocabulary for describing tactile experiences?

References

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