

# STUDY ON USER'S EMOTIONS AND NEEDS TO DESIGN A NEW PRODUCT FOR CARRYING SKI EQUIPMENTS

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## ABSTRACT

Users judge a new product on a series of product features based on their knowledge and expectation. Products with emotions are more usable and desired. To integrate emotions into products, designers need better understanding of people's emotions in relation to products.

The aim of this paper is to study on user's emotions and needs to design a new product for carrying ski equipments. The important issue is to identify the users' emotional orientations and demands in order to find out what their expectation of this tool would be.

In order to achieve an appropriate result, the approach of 'Emotional Design' was adopted. It addresses user's needs and desires which is at the center of product development.

Existing ski carriers were evaluated, and research theories and methods on Emotional Design were also reviewed. Research data were collected through interviews and surveys of more than 100 skiers between 15 and 45 years of age. Questionnaires were prepared based on existing and new arrival ski equipments. Skiers not only were to answer the questions about their existing problems, but also had to choose from a list of ski equipments pictures which facilitated the assessment of their taste on color and pattern. Research findings were produced by analyzing the data and led to develop a new, advanced product based on existing alternatives.

*Keywords: Emotional Design, Product Design, User's need, Ski Equipments*

## 1 INTRODUCTION

The issue of relation between emotion and design has gained significant interest within design practice and design research over the last decade. More and more professional designers and researchers are beginning to realize the important role of emotions play in product design, development, production, purchase, and final use. To integrate emotions into products, there needs to be better understanding of people's emotions in relation to products. In other words, there needs to be an understanding of how product features fulfill user emotions.

Users judge a new product on a series of product features based on their knowledge and expectation. Products with emotions are more usable and desired. Designers can create product emotions by designing product aesthetics, functionality and interaction.

The aim of this paper is to study on user's emotions and needs to design a new product for carrying ski equipments. The most important issue in this regard is to identify the users' emotional orientations and demands to find out what their imagination and expectation of this tool would be.

In order to achieve an appropriate result, the approach of 'Emotional Design' was adopted which implies studying users' emotional response and stimulating emotions such as pleasure and satisfaction in them. It addresses user's needs and desires which is at the center of product or technology development.

User Needs are conditions or situations in which something is required or wanted by the users. The increasing emphasis on human subjects in design practices requires ID designers to re-think how one user changes his or her needs under different contexts. In order to do so, designers first have to define the user and use context first. Then, can they research and analyze the user needs.

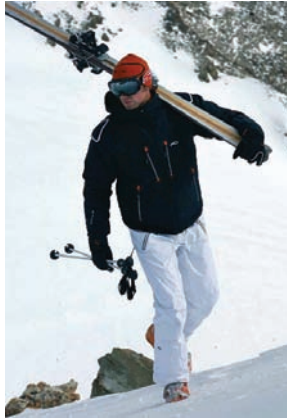
In order to describe user's need, it's better to take a brief look on common ski equipments. Skiing, one of the most energetic types of sports is highly influenced by new technologies. Ski equipments have been improved over time due to their technology of production, safety and aesthetic values. Apart

from main ski equipments, some accessories have been designed to promote comfort and safety of users.

While using a pairs of skis, ski boots and poles are essential; too many equipments and accessories, like gloves, helmet, protecting glasses, and ski suits are usually used by ski players. Skies have equal length of ski player's height, and are made of specific hard and heavy materials. Made by injected foam, ski boots are designed to bear under high pressure in different position while skiing, so they are heavy and voluminous. On the other hand ski players often keep pair of poles in high about half their length.

Usually access to Piste Gate from parking needs to pass through long and pitched roads and carrying ski equipments in this situation are so hard.

According to advanced studies, 97% of ski players carry their skies in their shoulders and 37% of them carry their ski boots on hand and remaining prefers to put on their boots during going to piste. In addition since there is no any other option, almost all of ski players carry their poles by hand. (Picture 1)



*Picture 1 carrying ski equipments*

Because all of these equipments are heavy (the average of ski equipments' weight is between 8 and 15 kg), carrying them by hand will cause pain and bad position in back and shoulders. Moreover, slippery snow covered surfaces and pitch of piste access roads make more problems.

As we recognized the problem, we studied all existing products in the market in order to find out why skiers are reluctant to use them anymore. The results shown that although they are useful in function, they could not make an emotional relationship with users. Thus we studied on users' needs and emotions to design an emotional product.

Skiers were investigated about their existing problems and needs. In addition a list of ski equipments pictures presented to them, which facilitated the assessment of their taste on color and pattern.

Color is one of the most significant stimuli delivered from the outside physical world. The colors we use or are surrounded by can often be a gauge of profession, age, sex, social position, standard of education and so on. In design, specific characteristics of objects are expressed through sensitive use of color [1].

## **EMOTION AND DESIGN**

Design methodology should address psychological and cognitive aspects based on human emotion and feeling as well as physical and functional aspects based on product structure.

Since the 1960s, it has been observed that corporations and designers have focused on creating user-friendly products leading to, among other things, softer organic forms and more vivid colors [1].

In today's highly competitive consumer market it has become increasingly difficult for organisations to gain competitive advantage on the basis of price, quality and technology [2].

Aesthetic design has therefore become a key factor in product differentiation. Furthermore, previous studies have identified that consumer's emotional responses to products have a

considerable influence on purchase decisions [3]. This knowledge has driven organizations to challenge designers to manipulate the emotional impact of their products through design.

Emotional design, as human centered approach, addresses people's needs and desires which is at the center of product or technology development. There are three major purposes of emotional design 1) identify and measure the contextual appraisals through research; 2) translate the appraisals to product attributes, and 3) embed the identified attributes in products through design practice.

Emotion is a mental state of the human mind. It is a person's quick judgment based on his or her personally relevant information. Emotional design has strong relation to users' knowledge (technology knowledge, previous experience, etc) and personal relevant information (financial status, self esteem, etc). It is hard to design emotion in product because it is hard to predict on individuals' emotional reactions. People's emotions are sensitive to the changes of time and environment. So, the research problems related to emotional design consist of how to collect data objectively from individuals and how to analyze the emotion-reaction data in a quantitative way. Product emotion is an attribute of a product and it prompts users' emotion. Product emotions are the anticipated emotional responses from users and they are related to identifiable product attributes. As all mass produced products are designed to accommodate a large number of users' needs, the challenge of emotional design is that a product should be able to evoke positive emotional responses among many users.

## **2 MATERIAL AND METHODS**

This project has been done in 2 steps: First, we focused on design research through literature review and survey. Second, we developed final product based on design researches and innovative methods.

### **2.1 research process**

The research processes are to:

1. Investigate literatures on Emotional Design Background, Ergonomic Studies, materials and manufacturing methods and etc.

The research process begins with the literature review that is very important to this study. Emotional design requires enormous amounts of data from different aspects which are impossible to be gathered by individual designers or from individual studies. There is no established design method since the concept of emotional design is still relatively new to the field of industrial design. A review of other research studies in emotion in design provides a background to investigative methods.

2. Study on users' need and taste through observation, interview, and questionnaires.

This paper has been sequentially organized in accordance with the result of those mentioned processes.

At first, in order to become familiar with skiers needs, a series of site observations and interviews were conducted during a whole day skiing, from skiers arriving with their cars till departing, between February 1<sup>st</sup> and March 6<sup>th</sup>, 2008, both in day and night shifts.

116 random elected skiers, male and female aged between 15 and 40 were investigated through a questionnaire, which it was prepared based on existing and new arrival ski equipments. Figure 1, 2 and 3 shows target group's information. According to figure 1, the number of males and females questioned was approximately same, although because there were more male ski players, their frequency is a little more.

Figure 2 shows that the frequency of males older than 25 years old was more than females in this range. Thus, the majority of questioned females were between 15 and 25 years old. Totally, 63 per cent of those sampled were between 15 and 25 years old and the remaining were between 25 and 40 years old.

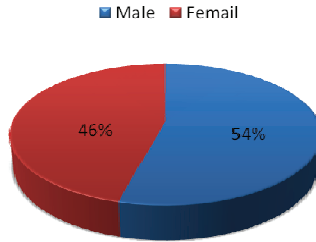


Figure 1. Gender frequency of samples

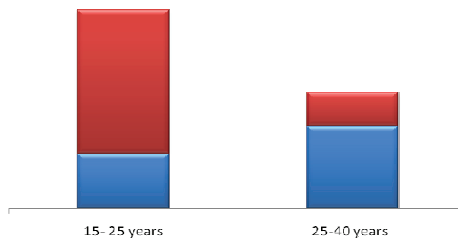


Figure 2. Age frequency of samples

Functionality of this sky carrier is one of the most important factors of this product. As figure 3 illustrates, the majority of those questioned had more than 10 years experience which helped us to develop our product features based on true needs of users. Among remaining, both samplers with less than 3 years old experience and samplers with 5 to 10 years experience had a frequency equal to 13.5 percent and samplers with 3 to 5 years experience were 11 per cent of all.

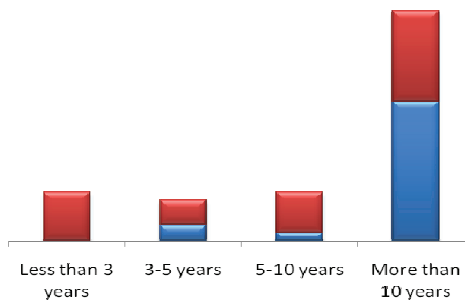


Figure 3. samples' experience in ski

Skiers were investigated about their existing problems and needs. In addition a list of ski equipments pictures presented to them, which facilitated the assessment of their taste on color and pattern. They asked to find their preferred ski suits colors among main 12 colors palette. Also the pictures of new fashion collections of ski suits, promoted with most famous ski brands, collected and categorized in two main plain (picture 2) and patterned groups (picture 3) that each group has 8 suits.



Picture 2. Plain suits

They asked to rated suits by giving a number among 1 to 8 which 1 used as lowest attraction and 8 used as highest attraction. We scanned the market to collect existing unused ski carriers. KJ Method was used to categorize products into 4 major groups. Skiers were asked to “Why they do not use existing models?” and “what are the advantages and disadvantages of each group?” We studied these questions in order to find out questionnaires taste and attractions. Base on above studies results and literature review information, we prepared a list of users’ needs and attractions that makes our design criteria. That list would work as a check list in design process to ensure that final product will be applicable in the most cases of use; even more, it will emotionally raise enjoyment and satisfaction of costumers.



Picture 3. Patterned suits

## 2.2 Design

Since we achieved users’ respects and desires, we have been able to develop our own ideas in different sketches. According to the holistic problems and the results of design research, design process starts with innovative methods such as brain storming and WH questions. Innovation, not only to create a functional product, but also to satisfy a high level of users’ emotions brought us varieties of sketches and forms which they were merged together later in order to develop the most capable concept. However the used method includes a wide range of applications, and it is able to encompass further functions. As you can find later, we add some more skier’s need and additional functions in finalizing phase.

### 3 RESULTS

As literature reviews, Figure 4 shows the correlations between product features and users' emotional reactions [5].

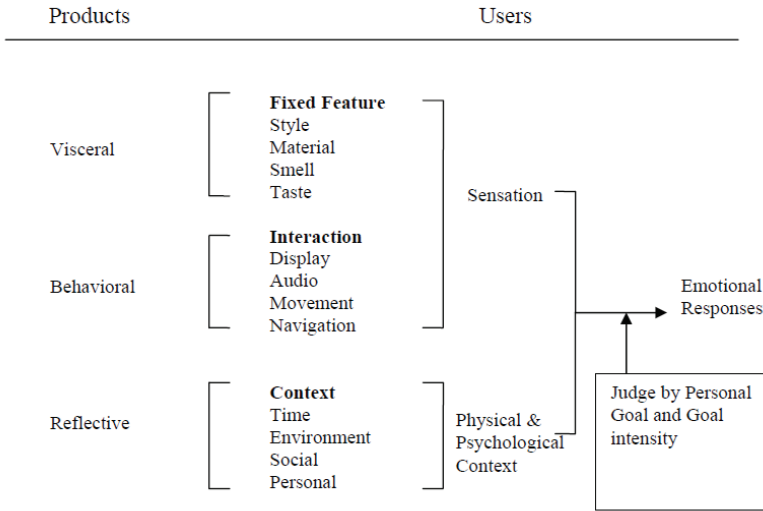


Figure 4. Correlations between Product Expression and Human Emotion

After analyzing observations, questionnaires and interviews, results of our researches categorized in three major group: (1) Primary needs, (2) Secondary needs, and (3) psychological needs. Below table 1 presents some concluded items in 3 major groups:

Table 1. User's need

Primary needs	Secondary needs	Psychological needs
Carrier for skies	Carrier for ski boot Easy to use Good function Easy to carry Economic Ergonomic Easy to fix	Enjoyable product Beautiful product Safety

As the figure 5 shows 65 per cent of those questioned believed that carrying skis is difficult. However, 35 per cents, who the majority of them were male, suggested that carrying ski boots are more difficult. Since the majority of samplers had more than ten years experience, carrying skis on shoulder might become ordinary for them and so they are seeking for a solution to carry their ski boots.

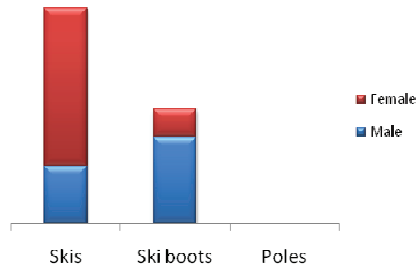


Figure 5. Carrying skis is more difficult for skiers than other equipments

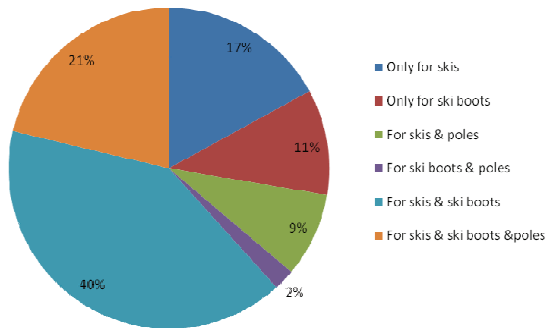


Figure 6. Expected functional preference in percent

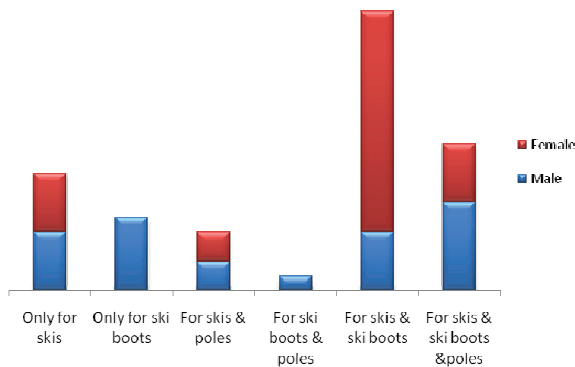


Figure 7. Expected functional preference

Also figure 6 and 7 show that most of samplers preferred to have a one product to carry ski and ski boots simultaneously. Among samplers, 17 per cent seek an equipment to carry their skis only, 21 percent seek an equipment to carry skis, ski boots, and poles all together, and 40 per cent seek an equipment to carry both skis and ski boots. These results persuade us to design a carrier for skis and ski boots. Skiers do not prefer use existing products because the time of carrying skies is too shorter than ski time and existing products are not suitable to carry during ski.

Investigation presents that skiers prefer ski carrier in form of back pack instead of other forms because of more functionality particularly during ski.

According to the results of questionnaire, figure 8 shows the taste of target group about color. As you see using dark colors ski equipments are more common, probably to make more contrast with snow. The results have shown that dark color which has been most chosen color by target group.

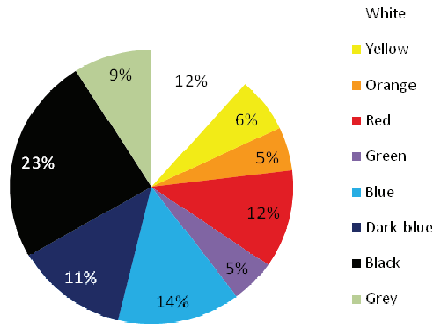


Figure 8. Samples color preference for ski suits

As the figure 9 and 10 show, target group prefer plain suits more than patterned suits.

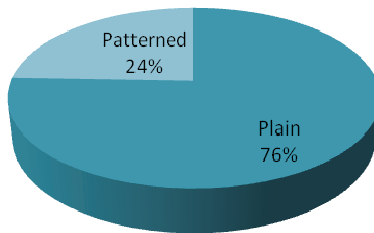


Figure 9. Samples' pattern taste for ski suits in percent

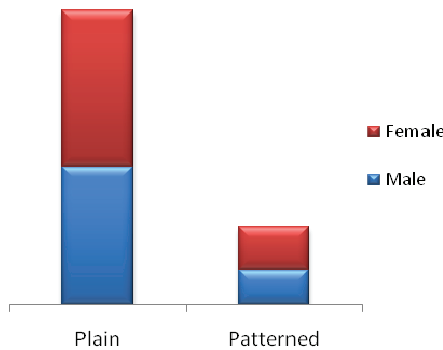


Figure 10. Samples' pattern taste for ski suits

Following table presents the results of questionnaires specifically for plain ski suits for both men and women. Skiers were asked to rank 8 suits in each group. They asked to rated suits by giving a number among 1 to 8 which 1 used as lowest attraction and 8 used as highest attraction. We analyzed information with weighted average method in order to find out more interested ski suit.

Results showed that women ranked suits number 2, 1 and 5, and men ranked suits number 3, 2 and 1 respectively as the most preferred suits. Concluding results of both groups, men and women, shows that suits number 2, 1 and 3 were best ranked suits.



Table 2. The results of questionnaires for plain ski suits

Plain suits	Suite 1	Suite 2	Suite 3	Suite 4	Suite 5	Suite 6	Suite 7	Suite 8
Female	3.46	2.42	4.92	5.5	4.69	5.76	6.65	6
Male	4.61	4.28	4.23	5.19	4.71	6.19	5.42	6.57
Average	4.035	3.35	4.575	5.345	4.7	5.975	6.035	6.285

Following table presents the results of questionnaires specifically for patterned ski suits for both men and women. Skiers were asked to rank 8 suits in each group. They asked to rated suits by giving a number among 1 to 8 which 1 used as lowest attraction and 8 used as highest attraction. We analyzed information with weighted average method in order to find out more interested ski suit. Results showed that while suits number 8 and 1 were ranked as the most preferred, women were rated suits number 1 and 5 for their second and third choices. In this case, men ranked suits number 3 as the most preferred, number 2 and 1 as the second choices and number 8 as the third one. Concluding results of both groups, men and women, shows that suits number 7, 1 and 8 respectively were best ranked suits.

Table 3. The results of questionnaires for patterned ski suits




Patterned suits	Suite 1	Suite 2	Suite 3	Suite 4	Suite 5	Suite 6	Suite 7	Suite 8
Female	3.69	5	5.42	4.69	6.73	6.88	4.42	3.69
Male	5.33	5.33	6.33	6.57	7.09	7.38	4.61	6.09
Average	4.51	5.165	5.875	5.63	6.91	7.13	4.515	4.89

#### 4 CONCLUSION

Designers should design products that function and that are understandable and usable, but that also bring other aspects, such as joy, excitement, pleasure, fun, and beauty, to people's lives [2][4]. Design for user experience aims to satisfy human needs beyond the merely instrumental, and to focus on how to create positive experiences.

According to the above-mentioned investigations and analyzes, we found out our product should be considered by the users as a friend and they would want to carry that whole day long. To ensure that, the product should satisfy skiers in both view points, emotionally and functionally.

Table 4. Color analyzing on most preferred ski suits

	First preference	Second preference	Third preference
Plain suits			



Our samplers preferred a back pack to carry skis and ski boots, with distinct emotional features. According to Figure 9 and 10, our market and target group prefer plain designs. Our investigation clarified a list of colors and patterns that users mostly prefer (Table 4) based on their background and social milieu. This information helps us to develop a ski carrier more acceptable and preferable.

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