CHAPTER NINETEEN

Understanding Attributes that Contribute to Pleasure in Product Use

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ABSTRACT

In recent years the concept of usability has been broadened from its original concerns with comfort, convenience and ease of use to include notions of pleasure and delight. Specifically these notions of pleasure and delight have been applied to the experience of actual use rather than to that attributed to the ownership or outcome of the use of a product, e.g. the pleasure of listening to music produced by an operated audio system. There is now interest among ergonomists and human factors practitioners concerned with evaluating the usability of products in including criteria which relate to pleasure and its opposite 'displeasure' in the experience of using a product.

But what is 'pleasure' or 'delight' in product use? How can it be described and hence included in product evaluation?

A number of studies have been carried out in the Ergonomics and Design Group at Loughborough University to develop methods for understanding what is meant by pleasure in the use of products. The research has looked at how people describe the attributes that contribute to the experience of pleasure or displeasure in using a product. It has also looked at whether there are generic concepts which can be applied to different products, or whether the concepts are product specific. Ways of assessing the strength of the association of the concepts generated with pleasure have also been investigated. Products have included such things as pepper grinders, nut crackers and bottle openers. A variety of methods have been used to investigate what is meant by pleasure in product

use, including focus groups, questionnaires, user trials and semantic differentials. Research results so far have not conclusively shown generic attributes that relate to pleasure and displeasure in product use. The product attributes or features which have been identified as being most closely linked with pleasure are aesthetics, effectiveness, grip, ease of use and control of the product. The features thought to be most important in judging displeasure are related to uncomfortable grip, unacceptable force, ineffectiveness and safety issues.

Certainly this is a start in our attempts to understand what contributes to pleasure or lack of pleasure in using products. There is a long way to go yet.

19.1 INTRODUCTION

In recent years, the concept of usability has been broadened from its original concerns with comfort, convenience and ease of use to include notions of pleasure and delight. Specifically these notions of pleasure and delight have been applied to the experience of actual use rather than to that attributed to the ownership or outcome of the use of a product; for example, the pleasure of listening to the music produced by operating an audiosystem. There is an increasing interest among ergonomists and human factors practitioners concerned with evaluating the usability of products including criteria which relate to pleasure and its opposite 'displeasure' in the experience of using a product.

There seems to be a trend in society to focus upon aspects of product use other than 'plain' usability. An example is a report from ISTAG (Information Society Technologies Advisory Group) Working Group 3 which is advising the EU Commissions 5th work programme (Ayre 1999), which suggests '(...) that there needs to be a greater recognition that the devices carried by users or the products, content and services that they interact with, have values other than a mainly practical one (...).'

There is clearly a commercial interest in investigating pleasure in the use of products (e.g. electronic games). User friendliness alone is not enough in a competitive market place. Products need to have other qualities in order to sell and be characterised as a good product in our commercialised world. One of these qualities is probably the feeling of pleasure in use.

Human factors research into ease of use has shown that the fact that something is easy to use is due to several attributes of a product and how these attributes are arranged. It is therefore not unlikely that the feeling of pleasure is created by several product attributes. But what are these attributes and how can they be measured and described and hence included in product evaluation and design? Jordan (1996) defines pleasure in product use: 'The emotional and hedonic benefits associated with product use'. And the opposite, 'displeasure' in product use: 'The emotional and hedonic penalties associated with product use'. These definitions were used as the basis for the studies presented here.

In this chapter, three studies carried out at the Ergonomics and Design Group at Loughborough University are presented. The studies discuss how traditional human factors methods can be used for the investigation of pleasure in the use of products. Further, we discuss how the results from the studies can be applied to the design of new products. Finally, there is a discussion on generic principles that describe the feeling of pleasure in product use.

19.2 WHAT SHOULD THE STUDIES INVESTIGATE?

Traditionally, human factors research has sought to identify generic principles for user friendliness, including concepts of learnability, memorability, efficiency, intuitiveness,

error tolerance and ease of use. Today one can say that there are some generic overall principles for user-friendliness that can be applied to most products and settings as, for example, the importance of consistency in a user interface. However, studies performed by Grundin (1989), discuss that the concept of consistent user interfaces is both context and product specific. The question is whether pleasure in product use is specific or generic. Thus, it is important to investigate if there are some overall principles for pleasure in the use of products that can be applied in product design and development.

The aim of most usability studies is either to develop methods or to use these methods to gather user specific information for the development of more user-friendly products and systems. The results from these studies must be applicable for those who design products, namely designers. For the methods and results to be applicable for designers they must be put into the context of the design process. The design process consists of several more or less defined phases. The name, number and content of the phases vary between designers, organisations and the products to be developed. In this chapter we will refer to a design process consisting of five phases, including an analytical phase, specification phase, concept development, detailed design and, finally, production. The studies presented in this chapter end at the specification phase.

If methods for the investigation of pleasure are to be of any use to designers, they must be easy to perform and require few resources. This is a problem for some traditional human factors methods for usability investigation. However, there are some generic principles of usability that designers have been able to take advantage of. Thus it has not always been necessary to conduct a complete study for every new developed product. Therefore, we also strive towards some generic principles concerning pleasure in the use of products and the development of 'quick and dirty' methods that can be used by designers directly.

The three studies presented in this chapter apply traditional human factors methods for the investigation of pleasure in the use of products. Three methods that should be well known by most designers were chosen: Focus group, questionnaire and user trial. The aims of the studies were both to evaluate the applicability of the methods to the investigation of pleasure and to identify attributes that contribute to pleasure in the use of products.

19.3 DESCRIPTION OF THE STUDIES

The three studies described below addressed a number of issues for increasing our understanding of the concept of pleasure in product use. The first issue was 'How can the concept of pleasure in product use be described – what are the key attributes?' This was addressed in word generation exercises. The second issue was 'How strongly are those words and concepts associated with pleasure in product use?' This was addressed in questionnaire exercises. The third issue was whether any of the words and concepts generated could be considered generic and hence applicable to other products. This was addressed in studies using two different products. A fourth issue was how the information gathered can be translated into design characteristics and information of value to designers, with the intention of designing products that are pleasurable to use. A more pervading issue addressed in the studies was whether current practice methods in human factors could be used to successfully investigate the topic of pleasure in product use. Although the studies were limited in scope they have produced evidence that leads us towards some positive conclusions.

All three studies where carried out at Loughborough University and the participants were all students at the same university. The products used as stimuli were nutcrackers and pepper grinders.

In our study, all three methods were interdependent. This means that data from the first focus group was used further in the questionnaire and data from the latter was used further in the user trial. Figure 19.1 below shows a simplistic view of the data flow between the three methods.

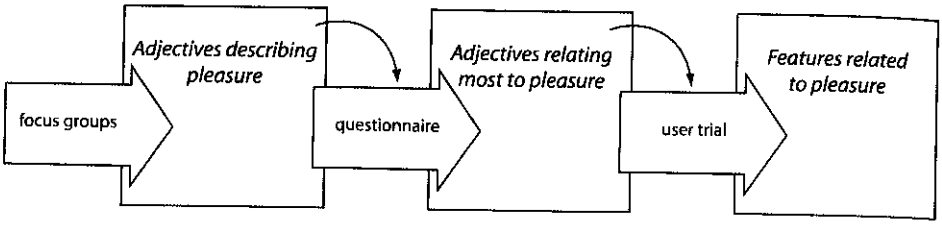

Figure 19.1 Data flow between the methods (studies)

19.4 STUDY ONE: FOCUS GROUPS

The aim of this study was to generate and study words that people use to describe pleasure and displeasure in the use of products. Four focus groups with five to six participants were involved. All four sessions were audiotaped. During the session the participants were first asked to use the three nutcrackers placed on the table in front of them, while individually filling in a form. The form asked them to write down as many words as possible that they related to pleasure and displeasure in the use of each of the nutcrackers. After completing this the participants discussed what they had each written down and tried to agree on three words that described pleasure and displeasure in the use of all three nutcrackers.

The focus groups generated many words (mainly adjectives) and phrases, which the participants used in describing pleasure and displeasure in the use of nutcrackers. These words were sorted into nine groups, depending on which attributes of the product they described. For example, if a participant wrote that the nutcracker had a 'nice colour' this would be regarded as applying to 'good aesthetics'. The nine-word groups are shown in Figure 19.2.

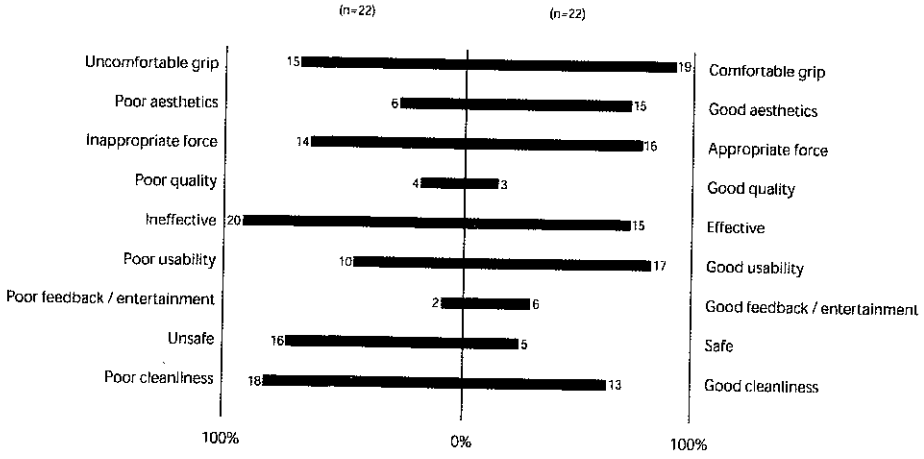

Figure 19.2 Word groups that relate to pleasure and displeasure
The number of participants mentioning one word or more in the respective word groups are shown beside the bars

19.5 STUDY TWO: QUESTIONNAIRE

The aim of the study was to investigate the strength of association of words generated in the focus groups to do with pleasure and displeasure in product use. The words generated in the focus groups were all given a suitable opposite and distributed randomly. This means that all the opposite pairs were split and randomly mixed with all the other words. The participants were asked to think about the words as product properties and rank each word on a scale from 1 (least pleasurable) to 7 (most pleasurable) in respect to how this word would relate to pleasure when using the product. Before the questionnaire was distributed to the participants it was pilot-tested by potential participants, and words that were difficult to understand were removed. At the end there were 29 pairs of words left (all together 58 words) (Figure 19.3).

	1 least pleasure	2	3	4 neutral	5	6	7 most pleasure
comfortable							
difficult							
smooth							
cold							

Figure 19.3 An example of how the questionnaire was constructed

The mean score of each word was calculated and opposites tested for consistency. This was done by counting the number of times each pair scored on the opposite sides of the scale. Figure 19.4 shows the words found to be most and least strongly associated with pleasure in the use of a product. The words shown in Figure 19.4 were also found to be the most consistent opposites.

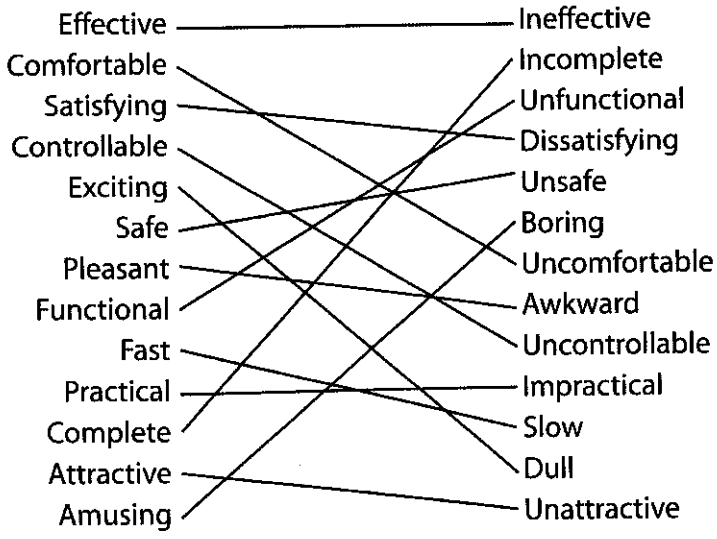

Figure 19.4 The words found to be most and least related to pleasure sorted with the most extreme first (by mean). The lines between the words connect the pre-defined opposites

19.6 STUDY THREE: USER TRIALS

The aim of this study was to investigate which features people relate to pleasure in the use of products and if the words found to relate to pleasure in the focus groups with the use of nutcrackers are also applicable to other products. Pepper grinders were chosen as the new product to be tested. There were ten participants in the pepper grinder trial and nine in the nutcracker trial. The participants took part one at a time and were asked to use the products while talking about the pleasure or otherwise of using them. After using the products for 5-10 minutes they were asked to pick out the product they found to be the most pleasurable to use and to fill in a form based on the 18 words most strongly related to pleasure from the questionnaire study. The participants were asked to write down the product properties of the chosen product that they found related most to the 'pleasure' word given.

The properties generated in the user trials were sorted into nine groups based on the attributes of the product the property described. Frequency counts were done to see how many participants mentioned each word under each of the 18 given words from the questionnaire study, and in total independent of the given words. Figure 19.5 shows the frequency of attribute groups in total.

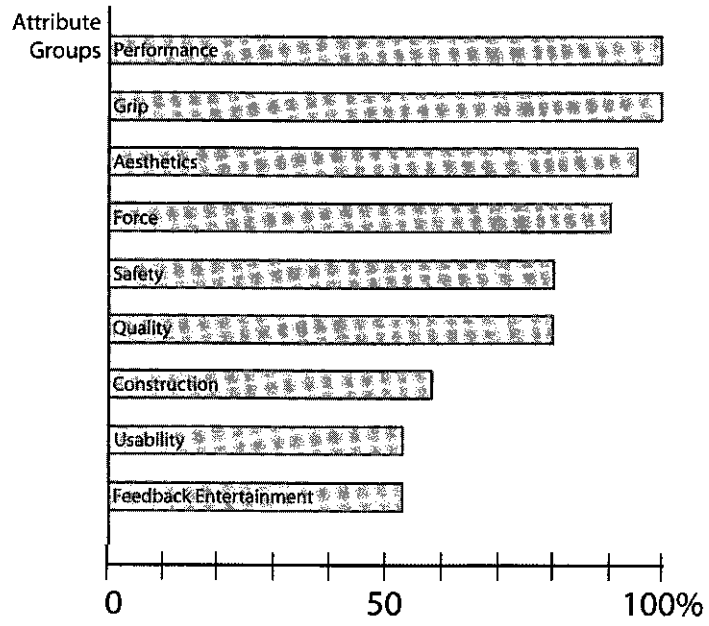

Figure 19.5 Total frequency of attribute groups (in percent) mentioned under the 18 given words

19.7 HOW CAN THE RESULT BE APPLICABLE TO DESIGN?

What do these three studies tell us about pleasure in the use of products and how can the results be applicable to designers? Let us start with the applicability for design. As mentioned before, the studies generated several words that were found to be important for the feeling of pleasure in the use of nutcrackers and pepper grinders. These words can be used to formulate a product specification for the pleasurable nutcracker and pepper grinder, which can be used directly in the design of new, more pleasurable products.

Figure 19.6 shows the product specifications generated for the pleasurable pepper grinder and nutcracker.

The pleasurable pepper grinder	The pleasurable nutcracker
Grip * Nice, smooth, warm and rounded touch. * Should give a firm and secure grip, so user feels that it will not slip out of their hands, and so that it is possible to control where the pepper ends up on the plate. * Should fit into any hand. * Wood was preferred to touch. *Aesthetics* * Should be a nice thing to look at, should blend into the kitchen, should not stick out too much. * Most participants preferred wood or see-through plastic. *Force* * Easy to turn, that is should not require too much force, but should feel resistance. *Quality* * Should have no wobbly parts, should feel solid. * Should give a sturdy impression, smooth and solid. * Should not easily tip over. * Must withstand being dropped or tipped over in the kitchen. *Feedback/entertainment* * Should give a nice grinding sound, and resistance so one can feel the mechanism working. *Safety* * Should be no small loose part that could be lost, or eaten by small children. *No chance of getting fingers into the grinding mechanism. *Usability* * Should be obvious how to fill it (most participants thought it to be from the bottom, and not the top). * Should be easy to get the pepper corns into the container. *Performance* * Should give enough pepper, not too much or too little. * The pieces ground should be small, no big shucks allowed. * Should be fast, should not have to turn many times. *Cleanliness* * Should not spill too much when putting it back on the table after use. *Construction* * All parts should fit perfectly together, so they slide naturally together when assembling. * The opening mechanism should stay fastened when grinding, should not be necessary to re-tighten it. * Should not be too small so it gets lost, but not too big either. * Should hold enough pepper so do not have to fill it very often.	*Grip* * Long (10-15 cm), smooth, rounded handles, which are not too thin. * Should fit any handsize, and should not open so wide that small hands cannot grasp it. * Wood was preferred to touch. *Aesthetics* * Should have some aesthetic value, should be able to be left on the table with the nuts. * Wood is said to blend in with the nuts, natural look. * Should look sturdy, smooth surfaces. *Force* * Should be able to control the force, so the nut does not crack into pieces. * Should not require too much force, anybody should be able to use it. *Quality* * Should give a sturdy impression, no wobbly parts. * Metal was preferred when thinking of durability. * Should not break when dropped. * Must withstand the pressure from the nut. *Feedback/entertainment* * Should be able to watch the nut being cracked, and see when it is ready cracked. * Should give a satisfying crunching sound. * Should be fun and not a hassle *Safety* * Should not shoot out nutshells. * It should not hurt to use the nutcracker, due to too much force or uncomfortable handles. * Should not be any hazard, or threat of hazard, to pinch fingers, skin, or palm of hand. *Usability* * Should be obvious where to put the nut, and how to use it. *Performance* * Should crack the nut on first attempt. * Give a whole nut. * The nutcracker should hold the nut safely. * Should be adaptable to different nuts. *Cleanliness* * Should not shoot out nutshells, but keep them contained. *Construction* * Should not be too big, so could fit into the bowl of nuts.

Figure 19.6 Product specifications for the pleasurable pepper grinder and nutcracker

These product specifications are rather vague. This means that the specification can result in very different solutions, depending on the designer. However, this does not mean that the specification cannot result in a pleasurable product. It might be that the specification is detailed enough. Thus a recommendation for future studies would be to carry through the whole design process. This study ends at the specification phase. However, it would be very useful to test prototypes based on the specification for pleasure in the use of products to establish if the new products are more pleasurable to use than the original ones.

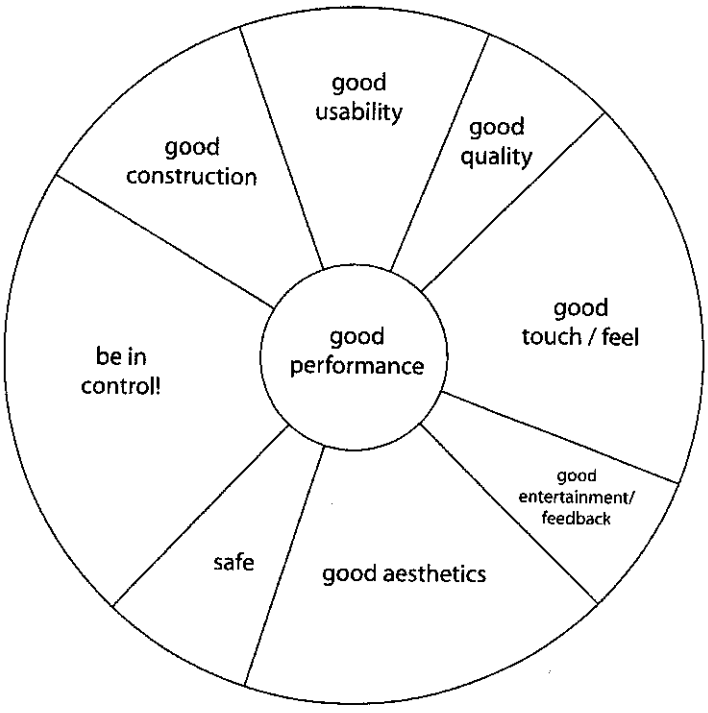

Figure 19.7 The pleasurable cake

The figure shows the attributes that contribute to pleasure in short-term use. The most important attribute for the feeling of pleasure seems to be good performance and it is therefore placed in the middle (the best slice of a cake).

So the results can be used to design a pleasurable nutcracker and pepper grinder, but does it tell us anything about pleasure in use in general? The results from our studies suggest that there are some attributes that contribute more strongly to pleasure in the use of products than others. It also suggests that there are attributes that must be present to create the feeling of pleasure in the use of the product. The 'pleasurable cake' (Figure 19.7) illustrates the results by the size of a cake slice. The bigger the slice, the more important for the feeling of pleasure. Our study only looked at short-term use. Most of the users had never used a product exactly like the ones in the trial. This means that the participants did not have the time to develop a relationship to the products. When a product is used and owned over months and years, other attributes like pride and nostalgia could be present (Jordan and Servaes 1995; Jordan 1996; 1998a).

19.8 IS THE FEELING OF PLEASURE PRODUCT SPECIFIC OR GENERIC?

The next important question to ask is whether the feeling of pleasure in the use of products is generic or product specific. Our study shows clearly that there are several attributes that contribute to pleasure in product use and that some contribute more than others. Thus it is interesting to investigate if the importance of the attributes is the same, independent of the products. Our last study attempted to investigate this by including a second product, pepper grinders. Pepper grinders and nutcrackers are very similar. They are both hand held, are operated by muscle force and are used to grind or crunch something to be eaten. This might suggest that in the case of these two products the feeling of pleasure should depend on the same attributes.

In the user trial, a frequency count was performed of the number of times the different words most associated with pleasure (from the questionnaire study used in the user trial) were related to the different attribute groups. The results from this frequency count show that there are similarities, but also some slight differences between nutcrackers and pepper grinders when it comes to the feeling of pleasure. Attributes that seem to be generic (at least for pepper grinders and nutcrackers) are comfortable grip, controllable force, performance, safety, aesthetics, ease of use and quality. Some of the attributes that show differences between the products are firm grip, little force and construction. These three attributes all seemed to be more important for the nutcrackers than the pepper grinders. This might be explained by the fact that to crack a nut requires more force than grinding pepper. Thus a firm grip, little force and a sturdy construction are important. However, these are speculations. What it does show is that one can hardly conclude that the feeling of pleasure is completely generic. There are probably some attributes that will always contribute to the feeling of pleasure in product use. However, the importance of each attribute is likely to vary between products. We anticipate that all the attributes in Figure 19.7 (the pleasurable cake) will contribute to pleasure to some extent even though the importance will not always be distributed as in this study. A good example would be the 'good feel/touch' which was very important in our study. That the product is nice to touch and feel is possibly only of importance in the case of hand held products. It would not be so important for a TV but rather more important for the remote control.

Although it is possible to conclude that some attributes will contribute to pleasure in the use of product, it is not clear what it is that makes an attribute pleasurable. As mentioned earlier, this has also been a topic of discussion for the concept of usability, as with consistency, which is context and task specific. The feeling of pleasure is probably task, context and product specific. In addition, we have to deal with attributes concerning aesthetics and entertainment which depends on individual taste and feelings. Jordan (Jordan and Servaes 1995; Jordan 1996; 1998a) also concludes that in long-term use attributes like pride and nostalgia contribute to the feeling of pleasure, which again are probably individual. For less individual attributes like usability, safety, performance, control, construction, touch/feel and quality it should be possible to find some general principles as to what makes it pleasurable. Today there exist several guidelines on how to make a user-friendly product, which can be used also for the purpose of pleasure. To make a product nice to touch and feel it should, for example, not have any sharp edges or be too cold or too hot. The performance of a product has to be seen in relation to the task which is to be performed. These examples suggest that it should be possible to create a list of issues that should be considered when a new product is to be developed, in order to make it pleasurable. However, the importance and details of each attribute must be investigated in each case.

19.9 APPLICABILITY OF THE METHODS

Study One: Focus groups

The focus group seemed to work very well in inspiring the participants. All participants had a lot of fun during these sessions. The concept of pleasure in the use of products can be difficult for users to understand and even more difficult to talk about. Focus groups, where several people come together to discuss a topic, can create a good group dynamic and can therefore make it easier to talk about difficult topics such as pleasure. Our experience from these studies was that it was easier to make a person talk about pleasure in a group than alone in the user trial.

The amount of output was also greater in the focus group than in the user trial. The forms that the participants were asked to fill in seemed to help to keep the focus on pleasure, and it also gave the participant some time to think through the topic on their own and to prepare before they had to talk about it in public. The results from our study show that a focus group is useful if the goal is to generate a lot of words or phrases that participants use in describing pleasure in the use of products. Because the focus group allows the participants to discuss a topic it probably generates more words than a user trial with only one participant. However, this requires that the topic of the focus group is made very clear to the participants through the whole study. Well-structured focus groups can give a lot of useful and important information that can be used in the development of a new pleasurable product. However, for the purpose of more empirical studies, other methods should be considered.

Study Two: Questionnaire

Several respondents said that they found the questionnaire difficult to complete. The reason for this was that they were not asked to think about a specific product. Some respondents mentioned that they would have filled in different answers, depending on the product they were thinking about, because some characteristics can be seen as pleasurable in some products and not in others. This might have resulted in more neutral scores than would have been the case with specific products. It would be interesting to test the questionnaire with specific products, to see if the answers would differ between products. Questionnaires are useful for empirical studies where a lot of data is required and it is also not a very expensive method, although this depends on the type and the extent of the questionnaire.

Study Three: User trial

As already mentioned it was more difficult to make the participant talk about pleasure in the user trial than in the focus group. It was also more difficult to keep the focus on pleasure because the participant quickly ran out of things to say about it. For this study to be of any use it is necessary to include some kind of stimuli (as the form in our study) to give the participant hints about what he/she could talk about. A user trial is fairly costly and time-consuming in comparison with the other two studies mentioned in this chapter. Thus it is probably not the most applicable method for the purpose of gathering requirements on pleasure, when developing a new product. However, if the goal is to gather quantitative data about how people see pleasure in the use of products, then user

trials should be considered. It would not, for example, be possible to deduce much about individual differences in responses to product attributes from a focus group in which participants are free to influence each other.

19.10 APPLICABILITY TO THE WHOLE POPULATION

It must be noted that all the participants in our studies were students and that the results would not necessarily apply to the rest of the population. For a broader understanding of pleasure in the use of products, studies including groups from the whole population must be included. For example, it is reasonable to assume that elderly people will feel differently about pleasure in product use than students. Pleasure depends on different product attributes which depend on individual taste and meaning as, for example, aesthetics. Some people would like to use a product more or less only because of its appearance and others would prefer a product that worked well even though the user would consider it ugly. In addition, the task setting is important when dealing with what people find pleasurable. For example, a professional chef would be likely to find it more important for the feeling of pleasure that a knife was functional, while this would be less important to a fourteen-year-old boy. Social and cultural settings are probably also important, especially when it comes to long-time use where attributes like pride and nostalgia are present. Figure 19.8 suggests that there are at least three settings that influence what makes us feel pleasure in the use of products.

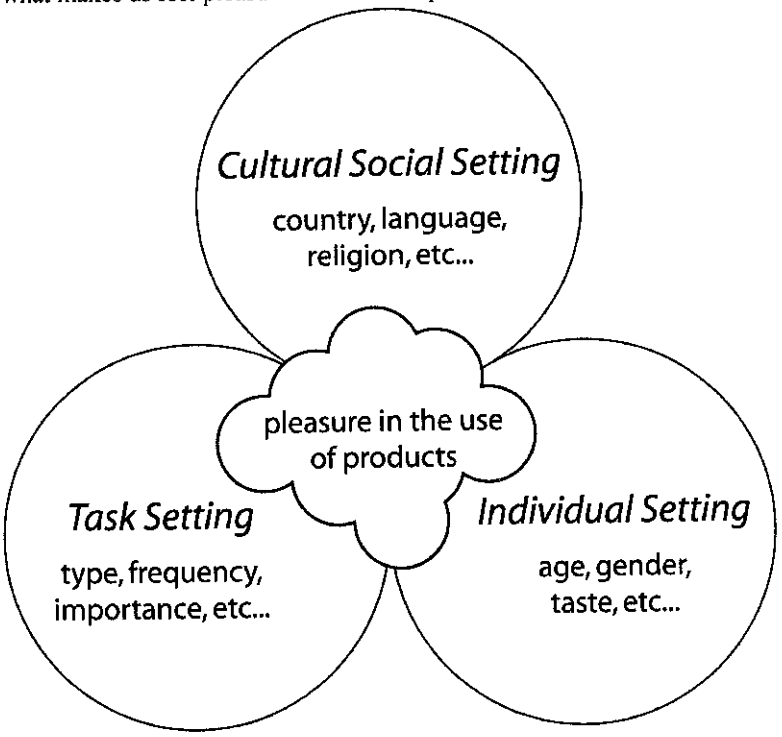

Figure 19.8 The figure shows three settings that probably influence the feeling of pleasure in the use of products

19.11 CONCLUSIONS

From the studies presented in this chapter we can conclude that the most important attributes that contribute to pleasure in short-term product use are good performance, pleasing aesthetics, good feel/touch, control of the product, good quality, safety, good construction, good feedback entertainment and good usability.

It is probably not possible to find a complete set of generic principles for the feeling of pleasure in product use that can be used directly in product development. However, it should be possible to find overall principles describing attributes, like those found in our studies, that must be considered if the goal is to create a pleasurable product. The details concerning the attribute design and importance must be investigated for each product and context.

The traditional human factors methods used had different applicability to the investigation of pleasure in the use of products. Focus groups were probably the most applicable method for use in product development when the right stimuli are given. However, both questionnaire and user trials are applicable when more quantitative data are required.

A recommendation for future studies would be to carry through the whole design process, from analysis to prototyping and testing. Testing one or more prototypes based on the results from the analysis and the specification based on it (see Figure 19.6) would give the ergonomist more confidence.

It is clear that the concept of pleasure in the use of products is complex. It is not due simply to one or two attributes of a product, and it can probably not be distinguished entirely from personal taste and values, cultural and task setting. Human factors experts do have a long way to go to find a valid and robust theory of pleasure in the use of products.

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