

I Love this Dress, It Makes Me Feel Beautiful! Empathic Knowledge in Sustainable Design

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ABSTRACT This paper presents a study on sustainable product relationships with an eye on textiles and clothing. A framework is constructed which integrates sustainable product relationships and the field and role of design. As a result, it studies how an empathic design approach could improve a sustainable design process. In order to promote sustainability, designers need to aim at enhancing long-term product relationships. By studying the user's relationships with and attachments to products, designers have the opportunity to create deeper product satisfaction and thereby long-term product relationships. This paper concludes by evaluating how an empathic approach can be of primary

importance in promoting sustainable product relationships by deepening current methods of understanding consumers' needs, values and emotions.

KEYWORDS: empathic knowledge, sustainable design, product relationships, product attachment

Introduction

 Most contemporary products are not designed for durability; instead they are throwaway articles because of their low unit price and low quality. It is no longer worthwhile to repair products, and the whole economic system in the industrialized world is actually based on products' fast replacement and planned obsolescence (Mont, 2008). The textiles and clothing field is no exception. Current industrial production and consumption of textiles and clothing function by and large on an unsustainable basis, and textile waste is increasingly going to landfill. Consumers fulfill many needs by consuming, and cheap product prices tempt them into fast and unsustainable consumption. Hence we need more knowledge about possibilities to extend product lifetimes in order to promote sustainable development.

To reach a more sustainable future path it is not enough merely to redesign existing products and make eco-efficiency improvements in products or manufacturing processes. Manzini (1994) argues that the actual focus in sustainable development should be on people's consumption behaviour, and he calls for a new radicalism to stimulate a drastic change in consumption patterns. Hence Manzini states that designers should concentrate on designing longer product lifespans, and at the same time consumers need to build a deeper relationship with the product in order to form a deeper attachment and care for the product.

Material possession represents our personality, social standing and wealth, but also our values, history and relationships with others; hence objects around us symbolize to us and others who we are. For example clothing unifies roles connected to identity, sexuality and sociality, and furthermore, clothing choices externalize the inner self (Woodward, 2005). The consumer's needs beyond functionality are of increasing interest to researchers and designers, and this has necessitated the emergence of the concept of empathic design (McDonagh *et al.*, 2002).

Emotions play a strong role in consumption. Textiles and clothing represent the desired lifestyle to which a consumer aspires (McCracken, 1988), and furthermore they are expressions of self and one's own identity. Textiles and clothing belong to the category of self-expressive products, which inspire consumption-related emotions, at least immediately after the purchase event. According

to Richins (2008) these feelings of excitement at purchase point are important for a consumer, but as consumption-linked emotions they have no link to product attachment, unlike the emotions stimulated during the use phase. At the same time, Mugge *et al.* (2008) argue that the product's utilitarian level is connected to the consumer's need fulfilment, and this process does not ensure that an emotional attachment will develop. As Mugge *et al.* (2005) point out, if the product performs according to consumers' expectations, this in itself does not lead to attachment. According to these authors some special meaning must be associated with the product or its use to inspire a deeper attachment, and through this, product replacement is postponed. On the other hand, positive use experience may lead to deeper product satisfaction, thus enabling the product's long-term use.

Many design processes are already familiar to consumer-centric designers: design styles, material choices, quality aspects, and functionality considerations. On the other hand the current system of manufacturing and doing business is based on products' fast replacement and planned obsolescence, and this system does not make it possible to design increased product longevity by increasing intrinsic quality (Mont 2008). This paper explores how an empathic approach can help to understand consumers' deeper values and needs and how such an approach can serve as a foundation for making more sustainable design. Other, deeper dimensions in product relationships – such as emotional values and the promise of future experiences – are a more problematic task to tackle with current consumer-centric methods and, this paper argues, require empathic design methods.

The present study investigates product attachments and long-term use in the context of textiles and clothing. This paper presents a framework that describes the designers' work field and role in fostering sustainable product relationships. The paper is structured in the following way. After the introduction section the data collected is presented. The many levels of product attachments with textiles and clothing are then described, and the determinants for textiles' and garments' long-term use are defined. Subsequently the study reflects this knowledge against the designers' work field and argues that it is essential to use consumer-centred empathic knowledge when aiming to extend product lifetimes. In particular, the person-product relationship needs closer study and an empathic approach to consumers' long-term product relationships. Finally a framework is constructed that unifies sustainable product relationships, emotional values in products, and the field of design.

Materials and Methods

This study focuses on the consumer perspective and is constructed on the basis of two questionnaires conducted in Finland. The study employs a qualitative case study method, and it can be described

as in-depth investigation (Anttila, 2006). The qualitative case study method has been selected in order to reveal the complexities in product relationships and to make these relationships understandable (Stake, 2005). According to Stake (2005) this can be defined to be a collective and instrumental case study, which is extended to several cases (several respondents) to offer possibilities to generalize. It is most valuable to gather insights directly from the consumers themselves; an online questionnaire makes it possible to involve a larger group of respondents. The responses from the questionnaires were content-analysed in the context of product attachment and product satisfaction, and throughout the study the empirical findings interact with theory. In the latter part of this paper the knowledge produced through the questionnaires is used to investigate designers' opportunities to use an empathic approach in offering long-term product relationships to consumers. The limitation in the case study is that the results may not be repeatable as such in other cultural contexts; nevertheless the textile and clothing consumption patterns in Finland are similar to those in other Western countries.

The first questionnaire was conducted as an online survey in April 2009. The link to the questionnaire was disseminated among design students at Helsinki Metropolia University of Applied Sciences, and Lapland University. Furthermore the link was available to staff at the University of Art and Design Helsinki, as well as on the following web pages: Fashion Finland, Eettinen Kuluttaja (Ethical Consumer), Vihreät Vaatteet (Green Clothes), and Kierrätystehdas (Recycling Factory). A total of 246 respondents participated in this questionnaire. A total of 91.8 per cent of respondents were women and 8.2 per cent were men. The majority of respondents were fairly young: 38.4 per cent being 18 to 25 years old, and 41.6% between 26 and 35 years old. One part of this questionnaire considered product attachments. Respondents were asked to write about their oldest garment as well as the oldest home textile they possess and reasons for keeping the garment or home textile. In all, 171 respondents wrote short texts about garments and 162 wrote texts about home textiles. The following section 'Product Attachments' is based on this questionnaire.

The next data collection was conducted in March 2010. This questionnaire was based on a 'snowball sampling' method with 204 respondents. The link to the questionnaire was randomly sent to about 30 people (equally male and female in different age groups) who were then asked to further disseminate the link to their acquaintances. Most of the respondents belonged to the age group under 35 years (29.4 per cent were 18–25 years old and 48.5 per cent were 26–35 years old), and 70.4 per cent of the respondents were women. This questionnaire included a section on clothing satisfaction. Respondents were asked to write short descriptions of the textiles and garments which stay long-term and also short-term in use, and further, the reasons for longevity or short-term use. A total

of 195 consumers answered the open question about long-term use, 197 answered the question about short-term use, and most of these responses considered clothing. These texts were analysed in order to identify the determinants for long-term use of textiles and clothing. The results are presented in the section 'Long-term Use and Product Satisfaction'.

Product Attachments

Schifferstein and Zwartkruis-Pelgrim (2008) define the degree of consumer-product attachment as the strength of emotionally engaged experiences a user has with a product. Durable product attachments emerge towards objects that are special and mean a lot to the user: if this kind of object is lost, the user experiences emotional loss. Hence this kind of product is unlikely to be disposed of.

Consumers create attachments to some objects whereas they easily dispose of others. From a sustainability viewpoint, it is important to lengthen the lifespan of many products. Hence designers should seek to strengthen the product attachment that consumers create in order to lengthen the lifespan of products. According to Schifferstein and Zwartkruis-Pelgrim (2008), seven determinants of product attachments can be identified: enjoyment; memories to persons, places, and events; support of self-identity; life vision; utility; reliability; and market value. The authors state that of these, only memories and enjoyment contribute positively to the degree of attachment.

Table 1 is constructed on the basis of the responses of the 2009 consumer questionnaire. Respondents were asked to write short stories about the oldest garment and home textile they possess. These replies painted a broad picture of how people emotionally bond to textiles and clothing. The oldest garments or textiles carried a strong connection to a particular person: they could be inherited, a present or simply represent a memory of someone close, be they mother, grandmother, father, another relative or a friend. Emotional value also emerges through memories that are linked to particular places, situations or life stages such as one's own childhood or even life achievements. Emotional attachments need to develop temporally, and often these meaningful and cherished products are linked to an individual's own history, some important person or memory. These emotionally meaningful textiles and garments may not even be used at all; hence they are kept for memory reasons only (Niinimäki, 2009; 2010a).

The interaction between user and object is on the basis of the aesthetic experience and at the same time pleasure that the object offers us (Lang, 1988). The dress, the body and the self in the social context are perceived simultaneously, and we can approach clothing as an embodied experience that is socially constituted and situated (Entwistle, 2000). Aesthetic attributes in clothing have an emotional

Table 1 Attachments to textiles and clothing (based on Niinimäki 2009; 2010a)

<i>Attachment attributes</i>	
Emotional values	Memories (history/past, places, people, moments, childhood) Family ties Positive associations (e.g. safe and soft tactile feeling)
Quality	High quality in design, materials and realization Durability
Functionality	Multi-functionality Fit Reparability
Design/Style/Beauty	Classical, timeless design, not too loud visual messages Strong design, represents some unique period of design style The experience of beauty in multi-sensorial ways
Material	Ageing well, aesthetically, gracefully
Connection to 'Self'/Personal values	Expression of 'self' Uniqueness Made for me One's own ideology
Effort, Achievement	Handmade Tailor-made Self-made Self-designed
Present/future experiences	Promise of experiences (e.g. modification possibility, party garments, opportunities for narratives to emerge) Family ties and continuity aspect, objects as heirlooms Suitability for gift-giving Satisfying experiences

effect on the wearer. For example, one respondent said that a dress has become important because 'I feel pretty when wearing it'. Clothing thus has a strong impact on our emotions (Raunio, 1995), and it can elevate the wearer's mood; according to Jordan (2000), this effect on a person's mood constitutes the emotional benefits of a product. We feel attached to garments because of their aesthetic beauty, as well as through beauty experiences over time that develop in social situations and through positive and multi-sensorial use experiences. The beauty of clothing is therefore not only visual, but also entails tactile, olfactory and kinetic experiences, such as the feeling of comfort, the weight of the material against our body, and pleasant touch and odour. The pleasure clothing offers to the wearer deeply involves the garment/body interaction, and this

has a strong and profound connection to tactile memory and our personal experiences and history (Niinimäki, 2010a).

According to Crozier (1994) the concept of 'home' is a complex one, and it has deep emotional significance. It represents sentimentality, affection and identity, but it also exposes a more intense emotional response. As stated earlier, material objects represent a consumer's identity, and the family level interlinks to an extended 'self' concept. This extended self concept encompasses the home and its items, including textiles. Home can thus be seen as a symbolic body for the family, and it is quite a central aspect to an individual's identity. We all surround ourselves with personal and important objects at home. Objects that include valued possessions also have 'self' wrapped up in them. Consumers link their identity strongly to objects that have been personified and kept for a long time. In contemporary consumer society home is made one's own through personal objects and decoration (Solomon *et al.*, 2002; Csikszentmihalyi and Rochberg-Halton, 1981). To illustrate this, when asked in the questionnaire what their home textiles meant to them, one respondent answered the following:

One's own home feels like one's own mainly because of curtains and carpets and because of the colours and patterns in the furniture.

When attachments to products have developed to the stage where the items have gained personal symbolic and sentimental value, they have earned cherishability (Chapman, 2009). When we value and respect the product in a deep emotional way, the product becomes meaningful, precious to us, and it deserves to be well taken care of (Walker, 2006). In this questionnaire several respondents mentioned the good care and repair of old cherished textiles and garments as reasons for longevity (Figures 1, 2 and 3). Furthermore the possibility to modify a textile or garment in the future was a reason to postpone the disposal of a product (Niinimäki, 2010a).

The textile has been saved because I want to retain these memories by taking good care of the textile.

I have a lot of basic clothes, which have lasted for years and which can be combined with more individual clothes. Moreover I have bought a lot of sensational clothes from flea markets, which can be worn as themselves or I modify them. Through them I express myself.

Long-term Use and Product Satisfaction

Meaningful attachments are not easy to embed in design, as they are personal and connected to an individual's history or personal experiences as described in the previous section. However,

Figure 1

Uniqueness is linked to the aspect of the handmade especially in home textiles. This pillow was made by the owner's mother, and it cannot be disposed of even though its style no longer fits with the home interior.



experiencing positive emotions in the use situation leads to product satisfaction, and hence positive use experience is important in long-term product relationships.

Some quality attributes contribute to long-term use, and they are strongly linked to product satisfaction. Swan and Combs (1976) argue

Figure 2

This hand-crocheted bedspread made by the owner's godmother is too emotionally valuable to be disposed of. It has taken a long time to make, and it symbolizes effort and love.

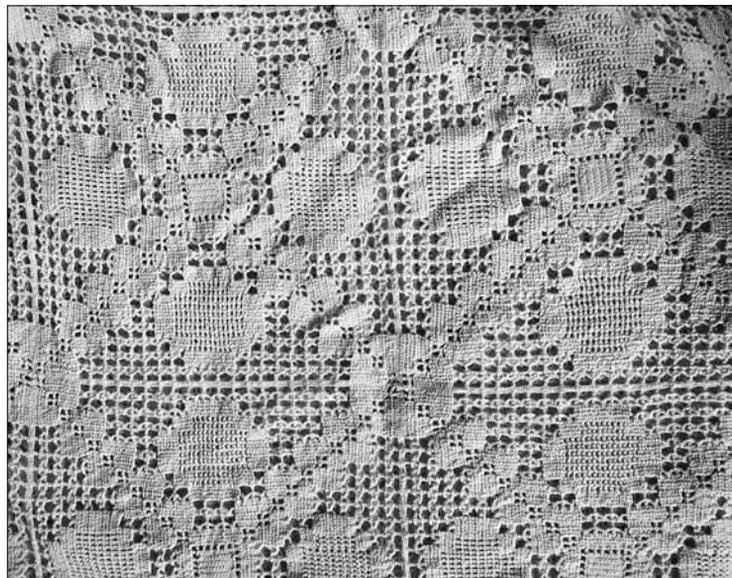




Figure 3
Objects from one's childhood have a special meaning to the owner. They represent a long-vanished period of a person's life.

that the physical properties of clothing interlink with the instrumental performance in clothing, while the consumer's psychological response to the garment is linked to its expressive performance. In product satisfaction the instrumental requirements must be satisfied first; however, fulfilling needs in instrumental performance alone will not result in satisfaction. The consumer's psychological needs with the product also have to be fulfilled. When consumers evaluate products through a limited set of attributes, product satisfaction is best achieved by ensuring a good performance in those attributes and dimensions that are important to the consumer (Swan and Combs, 1976).

The March 2010 questionnaire was conducted to gain more information about attributes in the long-term use of clothing and textiles. Respondents were asked to write about examples of garments and textiles that stay long-term and also short-term in use, and the reasons for longevity or short-term use. From the questionnaire the following attributes can be defined to be the determinants for long-term use of textiles and clothing: quality, aesthetical dimensions and functionality. According to the responses, the quality aspect includes durable materials, durability in use, stability while laundering (dimensional, material and colour stability) and high manufacturing quality. Functional aspects are also important for the consumer: that is, easy maintenance, suitability in use and satisfying use experience.

Furthermore, the following aesthetical attributes can be found as an important dimension for the consumer: beauty, style, colour, fit and positive tactile experience (good fit and especially comfortable materials in use). Moreover textiles and garments stay long-term in use due to a more classical style or colour, which looks good even when trends are changing. On the other hand a beautiful colour or special style can be the reason to keep the product. In these situations the expressive performance has been above average and

Figure 4
In leather the aging process is considered to be aesthetical.



resulted in satisfaction, and hence the reason to keep the product has been the beauty experience (Figure 4).

When considering satisfaction with textiles and clothing the main determinants are the experienced quality attributes. The product has to fulfil the consumer's expectations in quality levels: that is, a good instrumental performance is fundamental. Furthermore, an expressive performance, for instance the aesthetic experiences, must also be addressed to achieve deep product satisfaction, and this relates to the emotional response to clothing such as a sense of fashion and construction of self with external symbols.

Low durability and especially poor quality are determinants in dissatisfaction and result in short-term use of clothing according to the current study. Swan and Combs (1976) have shown that clothing quality is fundamentally linked to clothing satisfaction. They state that consumers often take the quality and durability aspects for

granted, and when asked about these issues in questionnaires, they point out that in clothing satisfaction, appearance is more important than durability. However, as mentioned, the instrumental attributes in satisfaction are most essential, as the instrumental performance requirements have to be satisfied first before satisfaction can move towards experience of expressive performance (Swan and Combs, 1976). In other words, expectations regarding the garment's physical properties and experienced quality have to be realized and fulfilled first in order to proceed to the consumers' emotional response to clothing and through this process achievement of deep product satisfaction (Figure 5).

Currently there are more and more products that do not last the optimum use time or they are discarded prematurely due to, for



Figure 5
If the textile or garment has a connection to some special person, it has a significant personal association and emotional value. In this photo is my mother's handmade dress from the 1950s.

example, changing fashions (Mont, 2008). Consumers experience a psychological obsolescence of products because of fast changing trends, social pressure or consumers' own changing emotional needs. In this dimension the discussion about consumers' deep inner needs and values could guide consumers, producers and designers towards sustainability: for example, when consumers' ethical commitment is high, the more value s/he puts on products' environmental benefits such as eco-materials, ethical manufacturing and eco-labels. 'Ethical hardliners' tend to prioritize a strong personal ideology as a primary attribute in purchasing decisions. These kinds of ideological and personal values also have to be addressed if the consumer is to gain a sense of deep product satisfaction (Niinimäki, 2010b).

Empathic Knowledge in Sustainable Design: The Designer's Field

These studies suggest that sustainable design needs to intensify the emotional bond or the satisfaction that consumers experience with the products. From a sustainability perspective it is advisable to design products that offer deep product attachment and satisfaction, which results in durable product relationships. This section maps out the design opportunities to promote sustainability through creating long-term product relationships via various design approaches. By highlighting selected quotes from the questionnaires, this section deepens the discussion on reflective attachment, discursive engagement and continuation aspects in product satisfaction.

Several studies have shown that the following design strategies offer the opportunity to create value in sustainable consumption: reliability and durability, easy maintenance and repairs, long life-guarantee, design for upgradability and variability, classic style and a strong person-product relationship (see Mugge *et al.*, 2005; Van Nes, 2003, 2006). Van Nes (2003, 2006) points out that what consumers need in the end is a well-functioning and up-to-date product that fulfils their changing needs. Accordingly the challenge in extending product lifetimes is in achieving continuing satisfaction with the product or forming deep product attachment over time.

To foster these long-term, deep product relationships, which are typically not 'designable' as such, one needs new design strategies. Here we enter a methodological problem as most of our knowledge about product attachment and long-term product relationships comes from questionnaires, that is, it is based on what people say. It does not give designers the kind of detailed information they need to promote long-term product relationships. Hence, an empathic approach to consumer-based knowledge is needed.

Empathic design approaches originally attended to the need to address precisely those hard-to-catch emotional product relationships that escape questionnaires and interviews. In empathic approaches, the idea is to let people define what is relevant rather

than working through researchers' categories. Essentially, the researcher's job is to observe, probe and listen to people in order to understand what kinds of meanings products have for them. By analysing pieces such as family jewellery, researchers can learn how they come to symbolize notions such as sorrow or connection to family over generations, both those long gone and those to come (Ahde and Koskinen, 2010). The problem with such relationships is that they are unique constructions and, correspondingly, not easy to reach through theory. For this reason, empathic designers have adopted more interpretative approaches. Instead of trying to break down the product relationship analytically, they have looked into the structure of specific product relationships, grounding theory in data.

An empathic approach provides a promising way to study the relationship between the user and the object. Consumers create a relationship with products at many levels. Some of these levels are accessible through consumer-centric industrial design techniques – especially everything related to visual appearance and tactility, quality and functionality aspects – but deeper emotional levels are not. There are several empathic techniques that can be applied here (Black, 1998; Segal and Fulton Suri, 1997). One promising way to do design differently is co-design, giving people an active role in the design process itself: that is, the designer can create proactive partnerships with end users and through this connection and knowledge thereby better understand the user and his/her individual needs (Rizzo, 2009). Another way to deepen the product attachment and postpone the product replacement is through personalization and do-it-yourself practices, which symbolize an accomplishment to the consumer and expression of one's own individuality. Halfway products, modular structures, customization, co-creation, and design services offer this dimension in textile and clothing design.

If the designer can connect the design outcome deeply with a consumer's emotions, identity construction, aesthetic needs and personal memories, that is, values and lifestyle, the design process can achieve a deep product satisfaction and product attachment (Figure 6a and 6b). The designer can influence the degree of attachment through designing products that better interlink with the consumer's needs and emotions. A design service that produces unique products, for example, with the help of digital technology, is one opportunity to produce meaningful uniqueness and emotionally durable textiles. In this way, the design process can be based on individual consumers' memories and meaningful associations (Niinimäki, 2009).

Reflective Attachments and Discursive Engagement

Positive product experience can result in product satisfaction as well as product attachment. Norman (2005) argues that there are three levels when processing product experience: the visceral, behavioural and reflective levels. The visceral level is the immediate one linked

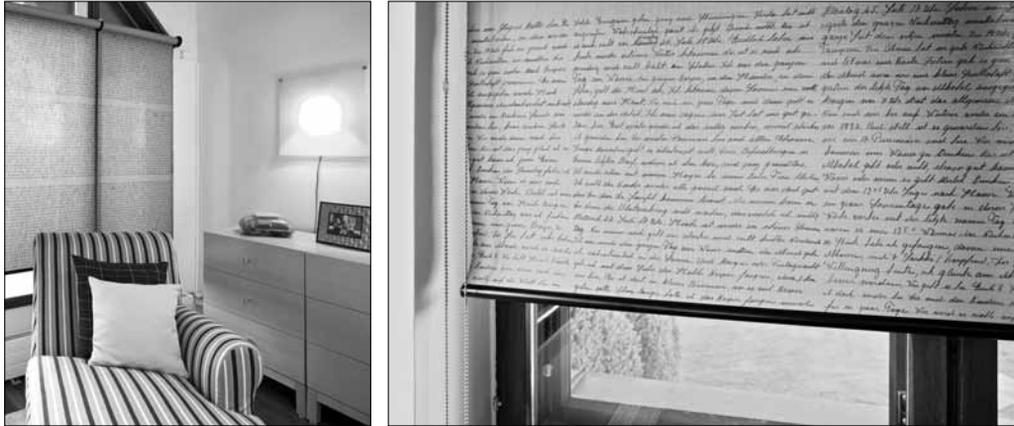


Figure 6a and 6b

A unique design process can create meaningful emotional experiences. The starting point for this roller blind design was the customer's grandfather's letters. Courtesy of Oy Vallila Interior Ab.

to appearance, where we make rapid judgements. This level is also a starting point for affective processing. The second level is the person's behaviour with the object, and at the behavioural level pleasure and the effectiveness of use are the dominant factors. The last level is the highest level, the reflective one, where a person can reflect upon his/her experience. The reflective level comprises feelings, emotions, self-image, personal satisfaction, memories and cognition. At this reflective level, therefore, both emotions and thought processes are fully operating, while at the lower level there is no interpretation, understanding or deep reasoning, only direct effect (Norman, 2005).

As Chapman (2009) highlights, the reflective level is fundamental in discursive engagement, which develops over time and connects the user with his/her inner discussion, identity construction, deep values through use, experience and satisfaction with the product. In discursive engagement new elements also act as a stimulus to sustained interaction with the product, and new elements help to focus attention on the object. Hence discursive engagement includes the change factors that develop or emerge during time and use (Chapman, 2009).

While the surprise element is important in discursive engagement, a designer should aim to embed a positive change factor in the product design. The following is a quotation from the questionnaire of 2009. When asked for the story of a long-life home textile, one respondent commented that the textile had been durable, because:

I have been involved in the design process of the textile and it includes my favourite colours. Originally the textile was designed for one of my homes, and it carries one stage of my life in it. The textile product can be reconstructed to fit the

space and you can change the shape of it. The product in a new place looks like it has been designed just for that place, and the materials have lasted well.

It can be interpreted that the owner of the textile has developed a deep product attachment, not only because the textile is unique, but also through being involved in the design process and having the possibility to influence the final outcome of the design process by embedding personal preferences in the textile. The textile carries a memory of a certain life stage. The respondent also continues the design process when moving into a new home: the user has a new experience with the product when rebuilding a new composition with the textile, which has a modular structure. The user can experience joy and thus actualize her/his creativity and be part of the continuing design process. Hence (s)he is creating meaningful uniqueness (Niinimäki, 2009).

Furthermore, discursive engagement can be catalysed through embedding in the product the promise of a future experience to come. One opportunity to accomplish this is through offering new kinds of services such as upgrading or updating, repairing or product modification systems or even more radical services such as product exchange stocks operating through the internet.

Continuing Product Satisfaction

Product satisfaction is formed from different elements according to product type. As Margolin (2002) points out it is easier to identify the operative dimensions of a product than the reflective ones. Reflective dimensions are interlinked with individuals' feelings and how they ascribe meaning, and it is therefore much more difficult for a designer to have any control over these aspects. Individuals can operate with objects according to different feelings and in any way chosen. According to Margolin (2002), someone can interact with a product through its operative value, its poetic dimension or its social significance. Hence all individuals have different experiences with products, and moreover a person's own product experience can change over time according to his/her values, attitude, personal history, past experiences and creation of meaning (Margolin, 2002).

However a satisfying use experience enables a long-term use of the product, and hence positive product satisfaction is a prerequisite for attachment to emerge in a temporal use context. Therefore through studying product satisfaction a designer can embed in product design those elements and attributes that are important to the consumer, in order to promote products' long-term use. These operative dimensions are easier to address than the reflective ones in the design process. The following is a quote from the questionnaire.

From the very beginning I felt a sense of ownership with this clothing; it works in all occasions, the quality is high, it is

timeless, I enjoy wearing it, and it ages beautifully. Moreover it has helped me create a personal clothing style through a combination with different clothes. The product expresses my personality.

One piece of clothing mentioned in the questionnaire was a man's dinner jacket that includes many levels of meanings and memories, personal association, as well as links to past, present and future promises of deep experiences. Not only has the high quality of the material and manufacturing process made the piece long-lasting, but also all the meaningful associations at the cultural and subjective level and experiences have created a unique value for this product. This jacket has a timeless design and it is multifunctional. The following is a quote from the questionnaire (Niinimäki, 2010a).

[The oldest garment I possess is] obviously the dinner jacket, which represents the 1920s. It was originally handmade for the movie *Fanny & Alexander*. Unfortunately I don't know who wore it in the movie. I bought it at the flea market in Stockholm Söder, Bondegatan [Bonde Street], sometime in 1981 or 1982. First I wore the jacket every day, and when I got bored of it I lent it to my friend, who also wore it frequently. I got married wearing that jacket (in fact twice). Now it is in the wardrobe, not used so much anymore. Sometimes I wear it at festive occasions. Now it has collected so much emotional value that it would be most difficult to give up.

The key to facilitating deeper product relationships thus lies in a better understanding of consumer-based quality attributes as well as in fulfilling consumers' emotional needs through the emotional and symbolic meanings of products. Taking a consumer-based view on eco-efficiency therefore suggests that it is important to study not only the product's environmental impacts, but also consumer satisfaction in conjunction with quality issues (Park and Tahara, 2008). This approach thereby also needs consumer-centred knowledge so that the designer can identify those attributes that are important to the consumer in different product groups and in different use contexts. Ensuring high performance in those attributes can result in deep product satisfaction and enable long-term use and the opportunity for product attachment to emerge.

Framework for Sustainable Product Relationships

The previous section mapped out the possibilities designers have to embed attachment attributes as well as product satisfaction dimensions in the design process and its outcome. This section builds on that knowledge, adding the emotional aspect into the discussion on how to frame designers' field of work in terms of sustainable product relationships.

Sustainable product relationships are constructed in temporal contexts and at many levels of meaning. Csikszentmihalyi and Rochberg-Halton (1981) distinguish certain categories of meaning related to objects. They describe objects' meanings related to the person, which are dimensions linking us to self, immediate family, kin and non-family aspects. There is also a non-person level that includes the past (memories and associations), present and future (experience, intrinsic quality of the object, style, utility and personal values). Schifferstein and Zwartkruis-Pelgrim (2008) propose that while forming an attachment to a new product, enjoyment is important, while attachments we form with old products are influenced by memories.

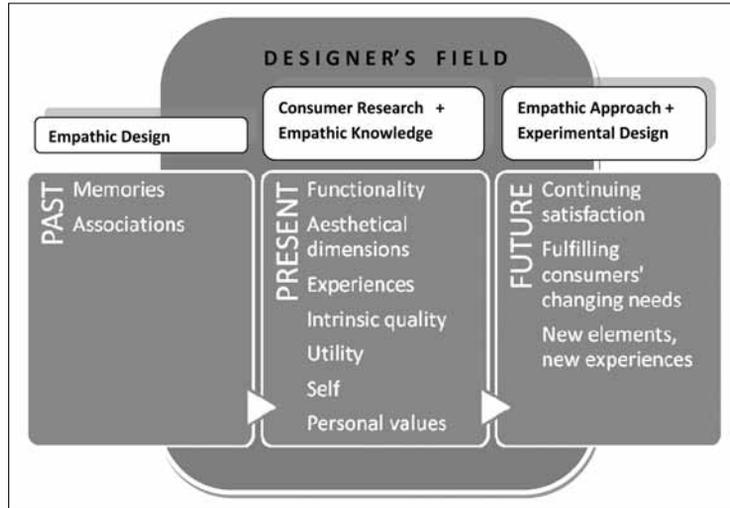
Forlizzi *et al.* (2003) highlight that the emotional product concept consists of a short and reflexive emotional response (emotional statement) and sustained and reflective response (emotional experience). When aiming for product longevity, the reflective response is more important as it is sustained and deeper.

The level of experience is very individual, and hence while the accumulation of memories is the most promising strategy regarding product attachment, it is a difficult task for a designer to achieve. Dimensions of product attachment related to the past (memories and associations) are based on individuals' own, very personal experiences. On the other hand present and future dimensions (experience, intrinsic quality of the object, style, utility and personal values) are easier to include in the design process. The designer can include these aforementioned attributes to create opportunities for emotional attachments to emerge through experiences and time (Schifferstein and Zwartkruis-Pelgrim, 2008).

A framework has been constructed that combines the attributes of sustainable product relationships and designers' empathic methods (see Figure 7). The framework is based on the temporal aspect of emotionally bonding with products. The designer can work with the present and future emotional experience levels in product satisfaction and opportunities for product attachments to emerge. However the designer can also use the consumer's personal history (individual meaningful memories and associations) as a starting point in the design process, aiming for unique design; this process needs an empathic design approach. At the level of the present the designer can provide good product performance in those attributes that are important to consumers and that are also determinants for the product's longevity. In this process the designer can combine consumer-centred research with empathic knowledge.

The future designer needs to provide satisfying and continuing use experience through, for example, high intrinsic product quality as well as satisfying aesthetical experiences. Furthermore, providing services that enable new experiences to come or new elements to emerge in the product or its use, or which fulfil consumers' changing needs, better ensures prolonged use. This future experience level

Figure 7
 Framework for sustainable product relationships, empathic knowledge and the field of design.



and especially the services mentioned earlier in this paper may be even more important than designing and manufacturing products when aiming for durable product relationships, consumers' sustained positive product experiences, as well as sustainable consumption with fewer but longer-lasting and emotionally meaningful products. When dealing with the future level in product relationships, the designer needs an empathic approach combined with experimental design and service thinking.

The field of work for designers, what designers can do, does not encompass all the levels of meaningful and sustainable product relationships as illustrated in Figure 7. It is especially difficult to capture meaningful past experiences and include them in the design process. Secondly it is problematic to ensure a long-term product relationship in the future, since consumers can act with the products in any way chosen and dispose of them despite a satisfying use experience.

Conclusions

This study described the elements in product attachments as well as determinants for long-term use in the context of textiles and clothing. Furthermore, it described the designer's opportunities to embed these levels in his/her design work to extend the product's lifetime. Moreover a framework was presented that combined sustainable product relationships, emotional values in product experiences and attachments, the empathic approach as well as the designers' role. A satisfying use experience can be achieved by fulfilling consumers' product expectations especially in the long-term use situation. The determinants for long-term use of textiles and clothing are their intrinsic quality, functionality as well as aesthetical dimensions. Fulfilling consumers' expectations at these levels enables product

satisfaction. Consumers create product attachments through many levels, such as their personal values, emotional values, memories and associations and construction of self. On the other hand some design styles, quality attributes, aesthetic dimensions including a product's aesthetical ageing process, and moreover functionality aspects enable product attachments to emerge. This paper highlighted design approaches that enable designers to embed these attachment elements and product satisfaction dimensions into the design process and its outcome.

The challenge in extending the product lifetime is in achieving continuing satisfaction with the product or forming deep product attachments through meaningful experiences over time. This challenge in sustainable design needs an empathic approach and consumer-centred knowledge. An empathic approach helps the designer to understand more deeply the consumers' needs, values and long-term product relationships, and moreover empathic knowledge enables the designer to provide deep product satisfaction as well as opportunities for future product attachments to emerge.

The task is not easy for one designer. This holistic approach to the consumer and his/her product relationships and inner emotional needs differs greatly from the approach in user-centred design or research focused on consumer preferences. In the latter the aim is for a short and reflexive emotional response instead of a sustained and reflective response, that is, emotional experience. Hence focusing on extending the product lifetime is an appropriate place to use both multidisciplinary scientific research findings as well as an empathic approach to understand more deeply the individual consumer in our contemporary consumer society. An empathic knowledge base offers a consumer-centred insight to the designer, which is of primary importance when promoting sustainable product relationships.

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Acknowledgement

The authors would like to thank the editors of this Special Issue for their constructive criticism and comments.