Abstract
This article presents a study that investigates product satisfaction in the context of clothing. The paper furthermore presents suggestions on how this knowledge can be used to create proactive fashion design for sustainable consumption. One of the main challenges in today's consumer society is how to design products that encourage consumers to engage in more environmentally responsible behaviour, sustainable consumption. This paper opens the discussion on how to change current unsustainable consumption behaviour related to clothing through a visionary, far-sighted design approach. Designers can create future-oriented sustainable designs that can transform consumption patterns towards more sustainable ones. Design for sustainability can thus be a redirective practice that aims for sustainable consumption, and the ways in which fashion design can be a proactive process with this aim will be described. This article shows why emotional satisfaction and enhancing a product's quality and other intrinsic characteristics are most important when attempting to extend the product's lifetime. Furthermore, this paper shows that services can create an opportunity to extend the enjoyable use of a product and offer satisfaction to consumers in a sustainable manner.

Keywords: proactive design, sustainable design, sustainable consumption, emotional satisfaction, PSS.

Introduction
Products configure consumer needs and use patterns; hence, design can be said to be “practice-oriented”, creating certain everyday practices and consumption behaviour (Shove et al. 2007, 134–136). Current industrial design and mass-manufacturing systems stimulate consumerism and the production of disposable products (Walker 2007, 51). Fast changing trends lead to consumers’ unsustainable consumption behaviour. To create a new, sustainable balance between design, manufacturing and consumption, alternative ways to create products are required to drive more sustainable consumption behaviour. Therefore, designers should evaluate how each design decision affects a consumer’s consumption patterns. Understood in this way, sustainable design can be a redirective or a proactive practice that aims for sustainable practices in consumption (Fry 2009, 53).

Higher production volumes and simultaneous growing consumption have caused an increase in material consumption (Throne-Holst et al. 2007). Ever-changing fashion trends, affordable product prices and low-quality products cause consumers to engage in unsustainable consumption behaviour, such as impulse purchases, overconsumption, short use time and premature disposal of products. The increase in the purchase...
This article presents a study on sustainable clothing satisfaction opportunities to decrease materialistic consumption. A PSS kind of product service system (PSS) should be developed that focuses on sustainable consumer satisfaction with a product or with other positive emotional states. The design process should sustain positive emotions in person–product relationships are from an environmental point of view, studying consumption momentarily. But it is very short term in nature and has no connection to the products, and with such products, consumption-related emotions and fashion items belong to the category of self-expressive behaviors, motivations and thought processes (Desmet 2009, 379). Emotions also play a strong role in consumption. The interplay between wants, needs, values, attitudes and experiences is emotionally meaningful for a contemporary consumer. Clothing can be categorized as artefacts of self-expression (Templeton 2009), and products, and with such products, consumption-related emotions are important to the consumer. As Richins (2009) argued, these consumption emotions are important elements in contemporary consumption and especially after the purchase event. The purchase situation becomes a strong positive experience for a consumer, positively influencing their later behavior. Emotions lie at the centre of human life, and they influence most of our behaviours, motivations and thought processes (Desmet 2009). Emotions also play a strong role in consumption. The interplay between wants, needs, values, attitudes and experiences is emotionally meaningful for a contemporary consumer. Consumption moves from momentary to deeper understanding of the opportunities to deliver satisfaction contributing to Tables 1 and 2. This study employs qualitative research methods, and information was collected through open questions has been content analyzed. Questionnaire A was conducted in April 2009 in Finland. The link to the questionnaire was disseminated among design students at Helsinki Metropolitan University of Applied Sciences and the University of Lapland. Furthermore the link was available to staff at Helsinki Metropolitan University of Applied Sciences and the Population Register Centre. For this questionnaire 137 respondents were women. Questionnaire B and C the attributes leading to satisfaction were explored through open questions. Moreover specific information on which attributes lead to short-term use of garments and dissatisfaction was collected and analyzed. This consumer-centered knowledge has been functioned for a better understanding emotional satisfaction in the field of clothing. In this study, the Attitude towards Consumption (ATC) and Planning (PL) are the main goals of their research, and these attributes were explored in these questionnaires. The evaluation frame of reference and the satisfaction attributes are formed into more sustainable ones, the ways in which design and how the enjoyable use of garments can be extended, deeper understanding of the opportunities to create a frame of reference against which they judge products (Oliver 1980). The level of satisfaction is determined by attributes connected to different use situations and the products’ symbolic meanings. For example, garments in an official work environment must meet certain expectations regarding social acceptance and social environment, clothing provides a relaxed and soft, tactile feeling, create a frame of reference against which they judge products (Oliver 1980). The first data mainly concerned young, ethically interested female respondents, the second survey also targeted male respondents and respondents without ethical interest. In this second data set most of the respondents represented rather equally different age categories: 17–18 years old 20.7 %, 20–24 years old 25.2 %, 25–36 years old 48.5 %, 36–45 years old 25.2 %, 46–65 years old 17.1 % and 46% 14.8% 56 years old.

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connected to the short-term use of clothing. The first laundering is critical in experienced quality, because garments can become stretched or the colour may fade during laundering. Low-quality garments may not be usable after the first wash because they lose fit, size or colour, or the material simply looks old after laundering. Low quality also results in garments coming apart or fading during the first laundering. Low durability, and, in particular, weak maintenance quality are key determinants for the short-term use of clothing. (Ninimäki 2011)

Hence good intrinsic quality is optimal for ensuring consumer satisfaction and to guarantee the longevity of clothing. High quality means durable materials and high manufacturing quality. The ageing process of a pleasant, aesthetic garment requires not only maintaining high intrinsic quality but also the design of a more classical style and use of durable materials. Some textile materials look old after a short use time. The material might experience pilling or may look old after a few washes. Garments needing frequent washing may look old rather quickly, therefore, recognising materials that age in a more aesthetically pleasing manner is important. Studies have shown (Ninimäki 2010) that consumers experience e.g. wool and real leather to age in an aesthetically pleasant way. Consumers report that with high-quality wool the ageing process does not show as obviously and in leather the ageing process is experienced as an aesthetic appreciation.

Consumers respect aesthetic attributes in the long-term use of clothing, and aesthetic attributes correspond to expressive performance in clothing satisfaction. Accordingly, expressive performance affects the psychological response to clothing. The aesthetic attributes that correlate to the longevity of clothing are good fit, personal cut, nice colours and comfortable materials, as well as a classical look (see Table 1). Garment quality is important to the wearer and a pleasant tactile experience during the use situation is one attribute for enjoyable long-term use of clothing. Garments stay in use for the long term not only because of a classical look but also because of a certain beautiful colour or a special style. In these situations, expressive performance is good aesthetic attributes that correlate to the longevity of clothing are good fit, personal cut, nice colours and comfortable materials, as well as a classical look (see Table 1). Garment quality is important to the wearer and a pleasant tactile experience during the use situation is one attribute for enjoyable long-term use of clothing. Garments stay in use for the long term not only because of a classical look but also because of a certain beautiful colour or a special style. In these situations, expressive performance is good for a designer to control. Table 2 presents the temporal dimensions in clothing satisfaction, combining those elements that a designer can control to avoid dissatisfaction. The previous section described the satisfaction elements in design and concentrate on design for sustainable satisfaction. The following section presents several design approaches to deeper person-product satisfaction in the field of clothing. With these design strategies the designer can aim to achieve proactive and sustainable design.

**Fashion Design for Sustainable Satisfaction**

How can a designer offer sustainable satisfaction to the consumer and how can s/he propose a prolonged use time of the product to the consumer? Firstly identifying the attributes associated with satisfaction and including them in the design is the most important strategy. Secondly identifying the determinants that lead to or diminish satisfaction and relating these determinants in design and concentrate on design for sustainable satisfaction. The previous section described the satisfaction elements in clothing:  
- **good intrinsic quality**;  
- **good functionality**;  
- **aesthetic attributes**;  
- values in the product, in manufacturing or the company’s values.

The easiest way to offer product satisfaction is to increase the product’s intrinsic quality and inform the consumer accordingly. However the clothing satisfaction process is complex and not easy for a designer to control. Table 2 presents the temporal dimensions in clothing satisfaction, combining those elements that a designer can control to avoid dissatisfaction helps the designer to avoid these elements in design and concentrate on design for sustainable satisfaction. The following section presents several design approaches to deeper person-product satisfaction in the field of clothing. These are the elements that a designer should try to embed in design if s/he is aiming for proactive fashion, deep product satisfaction and extended use time of the products.

### Table 1: Attributes that enable longevity in clothing

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Quality</strong></td>
<td>Durability, Durability in use, Durability in laundering, High manufacturing quality</td>
</tr>
<tr>
<td><strong>Functionality</strong></td>
<td>Easy maintenance, Suitability in the use situation (physiological and psychological suitability)</td>
</tr>
<tr>
<td><strong>Aesthetic attributes</strong></td>
<td>Beauty, style, colour, fit, Expressive beauty above average, Tactile experience, Comfortable materials</td>
</tr>
<tr>
<td><strong>Values</strong></td>
<td>Product’s values have to meet consumer’s personal values</td>
</tr>
</tbody>
</table>

Not only quality, functionality and aesthetics are important attributes; the values behind the product are also important to consumer satisfaction. Clothing choices must connect strongly with the wearer’s self-image, identity and values. Wang and Wallendorf (2006) have argued that consumers with high materialistic values seek novelty and evaluate their possessions more often than consumers with lower materialistic values. They also highlight that materialistic consumers have less appreciation for deeper person-product relationships that develop during longer use situations. Consumers’ materialistic values may also connect to the wearer and a pleasant tactile experience during the use situation is one attribute for enjoyable long-term use of clothing. Consumers with lower materialistic values may have greater appreciation for the personal meanings attributable to the product that emerge during long-term use (Wang & Wallendorf 2006). Consumers with high environmental and ethical interests place high importance on being able to find environmental value behind a product. These consumers respect connections to attributes – local and ethical production, eco-materials and long garment life-spans – and they want to see these attributes and environmental values in the products they purchase. The value aspect is most important and consumers’ value expectations should be fulfilled to create deep product satisfaction (Ninimäki 2011).

### Table 2: Elements of proactive sustainable fashion design

<table>
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<tr>
<th><strong>Past</strong></th>
<th><strong>Present</strong></th>
<th><strong>Future</strong></th>
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<tbody>
<tr>
<td>Meaningful memories</td>
<td>Good functionality</td>
<td>Continuing satisfaction with the product</td>
</tr>
<tr>
<td>Meaningful associations, which create person-product attachments</td>
<td>Aesthetical dimensions</td>
<td>Product or service fulfills consumer’s changing needs</td>
</tr>
<tr>
<td></td>
<td>Enjoyable experiences during use</td>
<td>New elements in design</td>
</tr>
<tr>
<td></td>
<td>High intrinsic quality</td>
<td>New experiences with the product</td>
</tr>
<tr>
<td></td>
<td>Product utility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Connection to self, identity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Product meets consumer’s personal values</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wearer’s own effort and achievement</td>
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</table>
An enterprise can also base its function only on consumer orders. The designer can create their own collections, produce a couple of sample collections and enable customers to specify all orders and measurements on an individual basis. Garments can then be created based on each wearer's measurements, thus enabling him/her to experience greater satisfaction. This design approach enables the product manufacturers to avoid the problem of overproduction. Small enterprises could offer their collections in small shops carrying a sample collection and obtain feedback directly from consumers, allowing them to avoid extra production.

Designer Anna Ruohonen creates long-lasting and high-quality fashion (Anna Ruohonen). She has created a timeless collection called Black Classic, where the designs are permanent but it is possible to order them in seasonal colours. Garments are manufactured only according to customer's order and according to each customer's individual measurements. This strategy helps to avoid overproduction. Moreover the good fit of the clothing helps ensure deeper garment satisfaction.

Co-creation

One possibility for creating deeper person–product attachment is through a consumer's own efforts during the design or realisation process. A sense of personal achievement is strongly connected to a positive sense of self (Norman 2005) and allows the user to experience greater satisfaction. This design creates the consumers' experience of engaging in the sense of effort and the opportunity to realise her/his own creative skills. The consumer is actively involved in the process, and he/she acquires a deeper knowledge of the product and, therefore, has the ability to repair the product (Papanek 1995). Kit-based design and half-way products give the consumer a more active role in the realisation process. The product is used, repaired and redesigned after a number of wearings or washes. According to the current study the main reason to dispose of garments is low quality. Quality is nearly impossible to evaluate otherwise tired of it, the consumer experiences psychological obsolescence and easily replaces the product with a new one. Accordingly emotional and psychological obsolescence results in a shorter realised lifetime.

Conclusions

The symbolic meanings of products are connected to psychological satisfaction through an emotional response. When the product no longer offers a positive emotional response because, for example, a clothing item has become outdated, the consumer otherwise tired of it, the consumer experiences psychological obsolescence and easily replaces the product with a new one. Accordingly emotional and psychological obsolescence results in a shorter realised lifetime.

Consumers report that they are ready to pay more for higher quality and durability if they could estimate these aspects at the time of purchase (Niinimäki 2011). Producers could offer information not only on quality but also on a product's intended lifetime. Manufacturers could also provide information on how manufacturing and consumption impact of manufacturing and consumption. PSS thinking as such would help consumers to consider more profoundly the durability of a product and the potential life times of this approach.

Global Manufacturing + Local Services

It is possible to combine global material recycling systems with local services. Between each user the clothes are professionally returned to the company by post and a new order for larger outfits and used for as long as it fits the child. The clothing is then professionally cleaned, disinfected and treated for stains. Combining a renting service with eco-products maximises the environmental benefits of this approach.

Fulfilling Consumers’ Changing Needs Through PSS

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One option for including the consumer in the design or manufacturing process is to offer her/him an opportunity to make decisions during the process. Consumers have shown an interest in taking part in the design or manufacturing process by using the Internet (Niminem 2010). Studies also exist on a modular structure and the consumer is allowed to make her/his own choices from a limited selection – in creating a unique style, this process gives consumers new power and a more active role. Lastwear is a company that offers ready-made garments, halfway clothing (kit-based) and trailer clothing (kit-based) and patterns of their fashion designs (Lastwear clothing company). They also invest in quality and offer a guarantee on their garments, which is a good way to ensure product satisfaction.

Consumers’ needs and aesthetic preferences that change over time raise the question of how to avoid the psychological obsolescence of garments. The challenge in extending product lifetimes is to achieve continuing satisfaction with the product. This can be achieved through the creation of a more flexible garment concept with a variety of potential uses or partial product realisations. A variety of design concepts such as modular and kit-based designs are put forward to increase the lives of garments and enhance garment satisfaction. The symbolic meanings of products are connected to psychological satisfaction through an emotional response. When the product no longer offers a positive emotional response because, for example, a clothing item has become outdated, the consumer otherwise tired of it, the consumer experiences psychological obsolescence and easily replaces the product with a new one. Accordingly emotional and psychological obsolescence results in a shorter realised lifetime.

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and offers new possibilities for changing the system. If sustainable development is a goal, it is necessary to find ways to slow consumption through sustainable design.

This study investigated product satisfaction in the context of clothing and this knowledge was used to understand and define proactive fashion design for sustainable consumption. It opened views into the process of consumer satisfaction. A main issue that arises when aiming to extend the life of garments is to increase their durability and intrinsic quality. Moreover, fulfilling consumers’ other expectations regarding the garment’s aesthetic and functional attributes is important to ensure product satisfaction. Finally the issue of value is most important with regard to deep product satisfaction: values associated with the product, the manufacturing process and behind the companies have to meet the consumers’ own value base so that the consumer feels completely satisfied with the product.

By identifying the reasons for the short and long-term use of clothing, it is possible to find new ways to create sustainable designs that can result in a redirective practice directed towards sustainable consumption. Proactive fashion design for sustainable consumption takes these reasons into account, thus enabling clothing longevity. Satisfying consumers’ expectations regarding quality, functionality, aesthetics and value is a key to extending the use time of a product. Moreover, the emotional side of consumption must be understood to provide more sustainable ways to ensure customer satisfaction.

The PSS approach provides an opportunity to extend the enjoyable use of a product and thus avoid psychological obsolescence and a garment’s premature disposal. Stimulating a sense of meaningful uniqueness and achievement through design services or “self-made” approaches is a promising route to enhancing the consumer and his/her emotional needs, and a new kind of green business thinking to do things differently. Designers can create future-oriented sustainable designs that can transform consumption patterns towards more sustainable ones. This is especially important in the field of clothing and fashion.

The most promising sustainable design strategy is the combination of product design with service elements: PSS strategies are therefore a future path to proactive and sustainable design.

Sustainable design can be a redirective or proactive practice that aims for sustainable consumption. We need visionary and far-sighted design approaches, empathic understanding of the consumer and his/her emotional needs, and a new kind of green business thinking to do things differently. Designers can create future-oriented sustainable designs that can transform consumption patterns towards more sustainable ones. This is especially important in the field of clothing and fashion.

References