



All images belong to the author

Kirsi Niinimäki is a Doctor of Arts and a researcher in the field of sustainable textile and fashion design. She has published several articles about textile and clothing consumption, person-product attachment, sustainable consumer satisfaction, empathic design in the context of sustainability and new sustainable design strategies. Currently, Kirsi Niinimäki works as a post doc researcher and teaches in the Master's Degree Programme in Creative Sustainability and Textile and Fashion Design at Aalto University.

Proactive Fashion Design for Sustainable Consumption

Kirsi Niinimäki

Aalto University, School of Arts, Design and Architecture, Design Research
kirsi.niinimaki@aalto.fi

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

of short-lifespan products results in a notable increase in waste. Currently, approximately 70 percent of disposed clothing and textiles end up in landfills, and in many Western countries clothing and textile waste is estimated to be the fastest growing waste stream (Fletcher 2008, 98). Consumers discard garments not only because they are worn out but also because they actively seek novelty. Nevertheless, product durability and long-term use are prerequisites for sustainable consumption: i.e. extending the life span of products is essential when the goal is sustainable consumption (Cooper 2005). Importantly, however, consumers associate durability with high quality and not with environmental impact.

Emotions lie at the centre of human life, and they influence most of our behaviours, 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 and fashion items belong to the category of self-expressive 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 society and especially after the purchase event. The purchase situation becomes a strong positive experience for a consumer, but it is very short term in nature and has no connection to the experience of deeper satisfaction or person-product attachment (ibid). Through a new purchase event, the consumer can again experience excitement, enjoyment, joy and pleasure, at least momentarily.

From an environmental point of view, studying consumption patterns and the meanings of consumption is important when sustained positive emotions in person-product relationships are desired or solutions are sought to replace materialistic consumption with other positive emotional states. The design process should focus on sustainable consumer satisfaction with a product or with the person-product attachment process. Moreover, a new kind of product service system (PSS) should be developed that aims to prolong the enjoyable use time of the product. A PSS strategy can also offer the consumer new emotional experiences, which can postpone the disposal of the product; PSS thinking can thereby aim to avoid a new garment purchase, which is an opportunity to decrease materialistic consumption.

This article presents a study on sustainable clothing satisfaction and how designers can include those elements and attributes in clothing design that can offer the consumer emotional satisfaction and extend the use time of the garment. The paper is

based on three consumer questionnaires conducted in Finland. The questionnaires have provided data and information on person-product attachments and product satisfaction in the field of clothing. Furthermore there are certain attributes that cause people to use clothing for longer or shorter durations, and these attributes were explored in these questionnaires. This knowledge functions as the basis for constructing a theoretical discussion on opportunities to create proactive fashion design. This article deepens the knowledge produced for the author's doctoral dissertation (Niinimäki 2011), contributing to the design field by defining proactive fashion design for sustainable consumption.

The paper begins by presenting the satisfaction process in the field of clothing. It also identifies attributes of clothing satisfaction. The article then presents ways to use these elements in the design process and subsequently describes how a PSS approach can offer new experiences and emotional satisfaction to the consumer in a more sustainable way. In fact PSS strategies can postpone product disposal by extending the enjoyable use time of the product or by offering new experiences to the consumer, and PSS can thereby postpone the product's psychological obsolescence.

Research Design

This study concentrates on the consumer perspective and is constructed on the basis of three online questionnaires. The study employs qualitative research methods, and information 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 Metropolia University of Applied Sciences and the University of Lapland. Furthermore the link was available to staff at the University of Art and Design Helsinki and on the following websites: Fashion Finland, Eettinen Kuluttaja (Ethical Consumer), Vihreät Vaatteet (Green Clothes), and Kierrätystehdas (Recycling Factory). A total of 246 respondents participated in this questionnaire. The vast majority, 91.8 %, of the respondents was women and 8.2% were men. The majority of respondents were fairly young: 38.4 % being 18 to 25 years old, and 41.6% between 26 to 35 years old. It can be concluded that the young female standpoint dominates the responses in this data. Open questions addressed the consumers' attachments to garments, i.e. person-product attachment. This information formed a basis for better understanding person-product relationships, and it was further used for Table 2 in defining elements for proactive sustainable fashion design.

The second data collection was conducted in March 2010. This questionnaire B was based on a 'snowball sampling' method with 204 respondents. The link to the questionnaire was randomly sent to about 30 people who were then asked to further disseminate the link to their acquaintances. The aim was to reach different consumers from the first questionnaire. As there was a preconception that 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 belonged to the age group under 35 years old (29.4% were 18–25 years old and 48.5% were 26–35 years old), and 70.4 % of the respondents were women.

Questionnaire C, in March 2010, was a random sample (simple random sample) sent to 500 respondents selected to represent the Finnish population: female and male respondents, different age groups between 18 to 64 years old, and geographically from all of Finland (selection from the population register system, Population Register Centre). For this questionnaire 137 answers were returned, a reply rate of 27%. Despite the low reply rate for questionnaire C, the respondents represented rather equally male (42.9%) and female (57.1%). Furthermore the respondents represented rather equally different age categories: 17.8% were 18–25 years old, 21.5% 26–35 years old, 20.7% 36–45 years old, 25.2% 46–55 years old, and 14.8% 56–64 years old.

In questionnaires 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 functioned as a basis for better understanding emotional satisfaction in the field of clothing, as described in the following section, as well as contributing to Tables 1 and 2.

Sustainable Satisfaction with Clothing

If current unsustainable consumption patterns are to be transformed into more sustainable ones, the ways in which design can offer sustainable satisfaction must be investigated. To gain a deeper understanding of the opportunities to deliver satisfaction by design and how the enjoyable use of garments can be extended, the satisfaction process must first be explained.

Consumer satisfaction is based on the size and direction of consumers' disconfirmation experience. Consumers have certain expectations of product performance related to being satisfied,

and dissatisfaction results when the product performs worse than expected (i.e. disconfirmation) (Churchill & Surprenant 1982; Oliver 1980). Consumers' product expectations therefore 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 codes in the expression of professional status. In the home environment, clothing provides a relaxed and soft, tactile feeling, and this experience symbolises security. With sports clothing, important aspects are functionality in action and durability in heavy use. Moreover, a consumer's own personal factors influence the evaluation frame of reference and the satisfaction attributes important to each consumer (Niinimäki 2011).

According to Swan and Combs (1976), the performance of clothing can be separated into instrumental performance (physical properties) and expressive performance. Expressive performance is linked to a consumer's psychological response to the garment, such as the experience of beauty. Instrumental requirements (e.g. quality expectations) must be satisfied first. Nevertheless, only fulfilling instrumental requirements will not result in satisfaction. Therefore clothing must also meet consumers' emotional needs if it is to deliver satisfaction (Swan and Combs 1976).

The set of attributes through which consumers evaluate products is limited and therefore possible to define. Some attributes are determinants leading to satisfaction whereas other attributes are related to dissatisfaction. A good performance according to attributes important to the consumer is the best route to ensuring product satisfaction. (Swan & Combs 1976.)

Satisfaction with clothing is fundamentally connected to clothing quality. Often consumers take the quality and durability of clothing as self-evident, and when asked about these issues in questionnaires, they point out that appearance is more important than durability for clothing satisfaction (Swan & Combs 1976). Nonetheless, the clothing must first meet expectations regarding physical properties and experienced quality (quality experienced in the use situation) before it can satisfy the consumer's emotional needs (emotional satisfaction).

According to questionnaires B and C low garment quality causes dissatisfaction among consumers and, accordingly, low quality is

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 before or during the first laundering. Low durability and, in particular, weak maintenance quality are key determinants for the short-term use of clothing. (Niinimäki 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 (Niinimäki 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 attractive temporal dimension (ibid.).

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 classic look (see Table 1). Garment tactility 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 (expressive beauty) is above average, resulting in satisfaction and postponement of garment disposal. (Niinimäki 2011.)

The attributes that enable longevity in clothing are the following:	
Quality:	Durable materials Durability in use Durability in laundering High manufacturing quality
Functionality:	Easy maintenance Suitability in the use situation (physiological and psychological suitability) Satisfying use experience
Aesthetic attributes:	Beauty, style, colour, fit Expressive beauty above average Tactile experience Comfortable materials
Values:	Product's values have to meet consumer's personal values

Table 1: Attributes that enable longevity in clothing

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 with social status-related elements in garments and possessions. 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 credence quality 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 (Niinimäki 2011).

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 dissatisfaction helps the designer to avoid these elements in design and concentrate on design for sustainable satisfaction. The previous section described the satisfaction elements in clothing:

- good intrinsic quality;
- good functionality;
- aesthetics;
- 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 and attributes that enable satisfaction to emerge or even create person-product attachments 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.

PAST	PRESENT	FUTURE
Meaningful memories	Good functionality	Continuing satisfaction with the product
Meaningful associations, which create person-product attachments	Aesthetical dimensions	Product or service fulfils consumer's changing needs
	Enjoyable experiences during use	New elements in design
	High intrinsic quality	New experiences with the product
	Product utility	
	Connection to self, identity	
	Product meets consumer's personal values	
	Wearer's own effort and achievement	

Table 2: Elements of proactive sustainable fashion design (based on Niinimäki & Koskinen 2011)

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 with Meaningful Uniqueness

Products carry symbolic meaning, which consumers use to construct their own personality and identity. Consumers use products to express themselves and want association with the characteristics, uniqueness or values symbolised by a product (Norman 2005). If products are easily personalised, the opportunity exists to connect the product more deeply with consumers' identity construction and to create deeper product satisfaction and an emotional attachment through the person-product relationship (Chapman 2009). This opportunity enables the product to be more meaningful to the wearer, making possible an extension of the product's lifetime.

Design services are one opportunity to address consumer satisfaction by deeply connecting the design outcome with a consumer's personal needs. By using digital technologies that enable individual design or measurements, meaningful uniqueness can be designed. Furthermore, unique design and "made-to-measure" services offer improved product satisfaction by meeting a consumer's individual needs and preferences better than mass-manufactured garments. The company NOMO Jeans offers computer-assisted made-to-measure jeans by using a 3D scanner (Nomo Jeans). Jeans are made individually according to each customer's measurements. The customer can also choose the cut, colour, effects and details of his/her jeans.

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 consumers 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 and manufacturing strategy may also help producers avoid the problem of overproduction. Small enterprises could offer their collections in small shops carrying a sample collection and obtain orders 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 product to begin to be more important to the wearer. The consumer's own achievement through a "made by me" approach to design creates positive experiences through the sense of effort and the opportunity to realise her/his own creative skills. If the user builds the product herself/himself, s/he acquires a deeper knowledge of the product and, therefore, has the ability to repair the product (Papanek 1995). Kit-based design and halfway products give the consumer a more active role in the realisation process.

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 (Niinimäki 2011). If the design is based on a modular structure and the consumer is allowed to make her/his own choices – even from a limited selection – in creating a unique style, this process gives consumers new power and a more active role.

Opening fashion field is one way to offer the consumer more active role. Lastwear is a company that offers ready-made

garments, halfway 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.

Giving consumers more power is also possible by offering environmentally-related options. Consumers may be allowed to select a manufacturing location and different materials – and be provided with corresponding prices – enabling them to express their values through their choices. For example, many consumers, especially those who consider themselves ethical consumers, would like to buy locally manufactured garments even if they are more expensive (Niinimäki 2011).

Fulfilling Consumers' Changing Needs Through PSS

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, it falls out of fashion or the wearer becomes 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 premature disposal of a product that may still be functional.

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. The PSS approach allows the creation of new experiences with a product or changes to a product to enable it to better suit a consumer's changing needs.

Positive ways that a product's lifetime can be extended include upgradability services, modification services and exchange stocks. These strategies can postpone garment disposal by keeping the consumer satisfied longer. Modification or redesign possibilities for quality garments allow for an extension of a product's life span. Many websites already advise consumers on how to modify their old garments themselves and encourage consumers to extend the use of their garments. Many small and locally functioning repair and redesign studios also already exist, where the consumer can repair a damaged garment but can also order a redesigned garment made from old ones.

A design based on a modular clothing structure also offers the possibility to create services to upgrade garments. This strategy offers the opportunity to update the appearance in a sustainable way (Fletcher & Grose 2012, 82). It is possible to play with the

clothing elements to create unique combinations of colours or shapes to develop a new look. The consumer does not need to then buy a new garment; instead s/he can simply change some parts or elements in the garment to have the experience of newness.

Garment exchange or renting services offer possibilities for consumers to make changes to their clothing in more sustainable ways. New and interesting examples of clothing membership clubs exist. By paying a monthly membership fee, a consumer can select a certain number of garments to use, giving him or her the opportunity to change the appearance in a more sustainable way. This type of business strategy has emerged e.g. in the field of children's clothing. Consumers can rent children's outfits and when the child outgrows a size, the parent can obtain larger-size garments from the clothing club.

The company Beibamboo offers children's wear made of high quality and environmental friendly bamboo material (Beibamboo). It is a rental service, from where children's wear can be rented and used for as long as it fits the child. The clothing is then simply returned to the company by post and a new order for larger clothes placed. Between each user the clothes are professionally cleaned, disinfected and treated for stains. Combining a renting service with eco-products maximises the environmental benefits of this approach.

High-quality products can be targeted for shared and intensive utilisation, such as for renting and leasing. Products appropriate for renting and long-term use must be made of high quality and durable material, because their producers view them as investments. This approach decreases the total environmental impact of manufacturing and consumption. PSS thinking as such guides manufacturers to consider more profoundly the durability of their products. In a PSS, the consumer purchases functions, product meanings and satisfaction instead of simply products. Accordingly, a PSS approach offers ways to decrease overall clothing consumption by dematerialising the satisfaction of a consumer's wants.

Global Manufacturing + Local Services

It is possible to combine global material recycling systems with local strategies to extend the use time of the product with a PSS approach. Accordingly closed loop strategies combined with strategies to extend the product use time can result in a new sustainable balance: slower production and consumption cycles. This approach would in fact dematerialize both production as well as consumption. By including local services in the product

design process, it is possible to deepen the product satisfaction through longer use.

One example of this strategy is employed by the company Patagonia. Patagonia not only takes back its own products, old garments to be recycled into new fiber material, but it is also ready to repair damaged ones: consumers can send damaged garments to the factory to be repaired. Furthermore the company co-operates with local tailors, who offer their services to mend the Patagonia garments (Patagonia). Patagonia thereby combines a local strategy to extend the use time of the product and to keep the consumer satisfied with a global closed loop system, and the company is implementing its producer's responsibility voluntarily.

More Information

To meet consumers' expectations in terms of quality or value, it is most important to provide them with the right information. The values behind the product or the company are important attributes in product satisfaction for quite many consumers. Hence transparency and more information about design solutions and manufacturing processes should be offered to consumers. This information is easily provided via the internet, and many companies already use this possibility.

According to the current study the main reason to dispose of garments is low quality. Quality is nearly impossible to evaluate at the time of making a purchase. Even the price of a product does not obviously correlate with the product's intrinsic quality. 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 many washes the garment will take and still look good. This information could help consumers quantify a product's quality and allow product prices to be set on the basis of high quality and long product lifetime. In sum, providing consumers with more information better ensures that s/he can identify those values in the product that best meet her/his own value base, and this is more likely to guarantee deep product satisfaction.

Conclusions

The business thinking in contemporary society is based on products' rapid replacement and extremely effective manufacturing systems. Current industrial systems for designing and manufacturing garments lead to unsustainable consumption behaviour. Taking into account consumer satisfaction widens our thinking

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 consumer satisfaction. If a consumer is satisfied, then strengthening the emotional bond between the product and consumer is possible. In turn, this meaningful attachment is the best way to postpone a product's disposal. When the product or its use is somehow special to the consumer, s/he will take good care of it to extend its enjoyable use time.

Service thinking and PSS can also dematerialise consumption by offering new ways to fulfil consumers' emotional needs for change, including concepts such as upgrading, renting, leasing, change stocks or investing in membership clubs. Designers must then focus not only on long-lasting and durable clothing designs but also creating new types of product-service systems to fulfil consumers' changing needs in a more sustainable way.

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

Chapman, J. (2009). *Emotionally Durable Design: Objects, Experiences, and Empathy*. 3rd Ed. London. Earthscan.

Churchill, G. & Surprenant, C. (1982). An investigation into the determinants of customer satisfaction. *Journal of Marketing Research*. Vol. 19:4, pp. 491–504.

Cooper, T. (2005). Slower consumption: reflections on products' life spans and the throwaway society. *Journal of Industrial Ecology*. Vol. 9:1–2, pp. 51–67.

Desmet, P.M.A. (2009). *Product emotion*. In: Schifferstein, H. & Hekkert, P. (Eds.). *Product Experience*. 2nd Ed. San Diego. Elsevier, pp. 379–397.

Fletcher, K. (2008). *Sustainable Fashion & Textiles: Design Journeys*. London. Earthscan.

Fletcher, K. & Grose, L. (2012). *Fashion & Sustainability: Design for Change*. London- Laurence King.

Fry, T. (2009). *Design Futuring: Sustainability, Ethics and New Practice*. Oxford. Berg.

Niinimäki, K. (2010). Forming Sustainable Attachment to Clothes. Paper presented in *7th International conference on D&E*, IIT USA 4-7 October 2010.

Niinimäki, K. (2011). *From Disposable to Sustainable: The Complex Interplay between Design and Consumption of Textiles and Clothing*. Doctoral dissertation. Helsinki, Finland. Aalto University, School of Art and Design.

Niinimäki, K. & Koskinen, I. (2011). I love this dress, it makes me feel beautiful: Emotional Knowledge in Sustainable Design. *The Design Journal*. Vol. 14:2, pp. 165–186.

Norman, D. (2005). *Emotional Design. Why We Love (or Hate) Everyday Things*. New York. Basic Books.

Oliver, R.L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*. Vol. 17: November, pp. 460–469.

Papanek, V. (1995). *The Green Imperative: Ecology and Ethics in Design and Architecture*. London: Thames and Hudson.

Richins, M. (2009). Consumption emotions. In: Schifferstein, H. & Hekkert, P. (Eds.). *Product Experience*. 2nd Ed. San Diego. Elsevier, pp. 399–422.

Shove, E., Watson, M., Hand, M. & Ingram, J. (2007). *The Design of Everyday Life*. Oxford. Berg.

Swan, E. & Combs, L. (1976). Product performance and consumer satisfaction: a new concept. *Journal of Marketing*. Vol. 40:2, April, pp. 25–33.

Throne-Holst, H., Sto, E. & Strandbakken, P. (2007). The role of consumption and consumers in zero emission strategies. *Journal of Cleaner Production*. Vol. 15, pp. 1328–1336.

Walker, S (2007). *Sustainable by Design: Exploration in Theory and Practice*. London. Earthscan.

Wang, J. & Wallendorf, M. (2006). Materialism, status signalling and product satisfaction. *Journal of Academy of Marketing Science*. Vol. 34:4, pp. 494–505.

WEB references

Anna Ruohonen: <http://annaruohonen.com>

Beibamboo: <http://www.beibamboo-shop.com/>

Lastwear clothing company: <http://www.lastwear.com>

Nomo Jeans: <http://nomojeans.com>

Patagonia: <http://www.patagonia.com>