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# Sustainable consumption and value propositions: Exploring Product-Service Systems practices among Swedish fashion firms

## Abstract

Since sustainable consumption (SC) research focuses primarily on consumer purchasing behaviors there is a gap regarding how firms attempt to shape sustainable consumption in practice. Utilizing nine case studies, this gap is addressed by exploring the use of value propositions entailing Product-Service Systems among Swedish fashion firms. The value propositions in use by the firms suggest that sustainable consumption may be extending beyond purchase to also include aspects of use and disposal, suggesting new reciprocal responsibilities for firms and consumers. Similarities are found in what elements firms incorporate in their value propositions (i.e., more sustainable textiles, repair, and take-back systems), but differences in how these are elaborated, testifying to the inter-organizational dynamics that embed practices. The paper ends with the specific cautioning that take-back systems may send illusionary signals regarding recycling that legitimize increased consumption and further accelerate material throughput which would be at odds with notions of strong sustainable consumption.

**Keywords:** sustainable consumption, product-service systems (PSS), value proposition, practice definition, sustainable fashion, waste, sustainable business models, circular economy

## Introduction

Consumption's expanding ecological footprint is well documented and alarming (Wiedmann et al., 2006; WWF, 2014). However, sustainable consumption (SC) is conceptually contested with weak SC focusing on so-called eco-friendly products and services, and strong SC focusing on levels and unjust distribution patterns (Lorek and Fuchs, 2013). Against this setting (see also Jackson, 2011), this paper addresses two limitations of SC-research: First, to understand the complexities of consumption as a pervasive social practice (Briceno and Stagl, 2006) investigations cannot focus exclusively on consumer behavior (Dobers and Strannegård, 2005; Soron, 2010; Young et al., 2010) which obscures "how producers construct the field of consumption to satisfy their interests" (Sanne, 2005, p. 318). Second, SC research has mainly focused on purchases and much less on the use- and disposal phases of the consumption process (Peattie, 2001; Prothero et al., 2011).

Subsequently, there is a need for analyses of how companies, through their value propositions, affect the scope of consumer practice throughout the consumption-cycle (Lebel and Lorek, 2008). Although recognizing that value propositions may be equivocal (Corvellec and Hultman, 2014), involving multiple actors' sense-making spread over time (Stauss et al., 2010), they represent communicative practices (Ballantyne et al., 2011) shaping SC within a particular context. Hence, value propositions are attempts to define, through practice and in a particular market setting, what SC entails. Arguably such practice definitions are more influential than the ostensive definitions advanced within science-policy fields (Corvellec, 2016; Latour, 1986) due to multiple consumer contact points, exemplified here through the retail chains and online omnipresence of Swedish fashion firms.

The fashion industry, from sourcing to selling, contributes to several serious environmental problems such as water pollution, green-house gas emissions, and waste (cf. Armstrong et al., 2015b). A typical cotton t-shirt (500 grams) bought in Sweden contains 4,100 liters of virtual water and has required an estimated three kilograms of chemicals in the production phase (NVV, 2010). By implementing Product- Service Systems (PSS) these and other environmental problems can, in theory, be minimized. Here, PSS exemplify value propositions, often described as entailing a sustainable potential (Goedkoop et al., 1999; Mont, 2002; Tukker, 2004), and recently implemented in the Swedish fashion industry. Moreover, PSS suggest changes in consumer behavior throughout the consumption-cycle (Briceno and Stagl, 2006; Mont and Tukker, 2006). Thus, the purpose of this paper is to explore the use of value propositions that shape SC through examples of PSS in the fashion industry. As such value propositions from nine Swedish fashion firms of different sizes and with different implementations of PSS are investigated and contrasted. The contribution of this approach is a better understanding of how PSS are implemented and what implications these practices have on both weak and strong sustainable consumption.

# Perspectives on Sustainable Consumption and Product-Service-Systems

Much research in sustainable consumption (SC) has focused on purchasing behavior (e.g., Young et al., 2010), choice between eco-friendly and conventional products (Peattie, 2001), and attitudinal antecedents such as values, beliefs and norms (Jansson et al., 2010; Stern, 2000). Here the attitude-behavior gap refers to the mismatch between pro-environmental preferences and actual purchases (Gupta and Ogden, 2009; Kollmuss and Agyeman, 2002). Other investigations target sociodemographic factors and sustainable life-styles, aiming at identifying sustainable consumers and business opportunities (Diamantopoulos et al., 2003; Peattie, 2010). However, limiting SC research mainly to the purchase phase is problematic as matters of use and disposal also have severe environmental impacts (Stern, 2000), through energy use, space requirements and waste.

Although analyses of consumer's choices are important, they might build on assumptions of sovereign consumers (Dobers and Strannegård, 2005). Attention only to the attitude-behavior gap might obscure the role of business practice in shaping unfolding understandings of what SC might, or should, entail. The latter refers to how SC is defined in practice and in situ (Corvellec, 2016; Latour, 1986), for instance through the value propositions of firms in their respective market settings.

Value propositions describe firms' assumptions of their purpose for consumers, differentiating them from competitors and underpinning their activities and resource use (Bocken et al., 2014). Here product-service systems (PSS), represent propositions that by replacing ownership with access or adding end-of-life or product-extension services is endowed with a sustainability potential (Mont, 2002; Tukker, 2004). For instance, Gaiardelli et al., (2014), describe use-related examples such as repair and maintenance, updates/upgrades, help desk, training and consultancy, and disposal-services such recycling and take-back. Thus PSS typically extend beyond purchase, affecting use and disposal.

Defined originally as "a marketable set of products and services capable of jointly fulfilling a user's need" (Goedkoop et al., 1999), PSS add services to products along a continuum from a "pure" product toward a "pure" service (Tukker, 2004). Here Tukker (2004) categorized three PSS-types, that prescribe different weight to the product- or service component, and the shift from ownership to access (Mont, 2002): 1) product-PSS adds extra services but ownership is transferred, 2) use-PSS keeps product-ownership with the provider making products accessible through leasing, sharing or pooling while 3) results-PSS are much rarer and involve consumers and providers agreeing on results, recasting products as utilized materials.

While certain PSS may do little positive for sustainability and rather function as financial arrangements (Mont et al., 2006), suggested positive impacts include upstream effects (sustainable design)(Besch, 2005), reduced through-put as existing products are more intensely utilized (Intlekofer

et al., 2010; Tukker, 2015), or adding services that reduce waste (Gaiardelli et al., 2014; Halme et al., 2006). Here intensifying use is better for products that are emission-intense during production rather than during use (Intlekofer et al., 2010). Moreover effects rely on PSS' embedding with, for instance pre-existing waste infrastructures (Author and co-author, forthcoming).

PSS research has clarified underpinning principles (Mont, 2002), types and classifications (Gaiardelli et al., 2014; Tukker, 2004), PSS design (Vezzoli et al., 2015), drivers and barriers of diffusion (Ceschin, 2013; Reim et al., 2014) of particular offers (Besch, 2005; Mont et al., 2006), and in general (Linder and Williander, 2015; Tukker, 2015). Moreover, the inertia in diffusing PSS has been shown, particularly in consumer markets, indicating difficulties in getting consumers to endorse value propositions (Tukker, 2015).

Despite inertia, renewed hope has been put upon PSS as an instrument for bringing about a circular economy (Linder and Williander, 2015; Tukker, 2015). The idea of access instead of ownership, as well as increasing take-back is, among others, promoted by the Ellen MacArthur foundation, supported by arguments of resource price-volatility and new norms of collaborative consumption (EMAF, 2013). Different ways at looking at access have also been problematized in relation to the sharing economy and collaborative consumption currently growing in popularity (e.g., Belk, 2014).

Regarding reductions in consumption levels and strong SC (Lorek and Fuchs, 2013), PSS is suggested to achieve this through dematerialization, by suggesting alternative value appropriation mechanisms (Bocken et al., 2014). Still PSS research has mainly explored production (Armstrong et al., 2015b; Mylan, 2015) warranting further analysis of the purchase-retail-production links.

However some authors conclude that consumers' appreciation of ownership hampers PSS' success (Halme et al., 2006; Tukker, 2015) while others find more ambiguous results (Armstrong et al., 2015b). Use- and results-PSS do not offer consumers product ownership, and ownership could represent intangible value, including dimensions of personal identity, control and convenience (Tukker, 2015). Moreover, because products are shared between multiple users, issues concerning intimacy and hygiene arise, the latter especially critical regarding clothes (Armstrong et al., 2015a; Catulli, 2012). Moreover, identity-formation could be tied to product-ownership, for instance the type of clothes one can buy, mixing elements of use and exchange value (Corvellec and Hultman, 2014), signaling what status groups one belongs to (Armstrong et al., 2015a) or simply that one is rich and successful (Alvesson and Robertson, 2016). Here, new practices of the collaborative/sharing economy come up against the entrenched norms of ownership (Belk, 2014). On the other hand, when products are accessed rather than owned there are intangible benefits, such as not having to care about performance, maintenance and repairs, or storage (Beuren et al., 2013; Heiskanen and Jalas, 2003; Mont, 2002; Vezzoli et al., 2015).

- Insert Table 1 here -

Sustainable fashion translates into several issues: sourcing of materials, suppliers' labor conditions, chemical, energy and water usage, transport, and, recently attention to post-consumer waste (Armstrong et al., 2015b; Fletcher, 2013). Fashion lends itself to PSS implementation to extend product life since production, both the spinning and dyeing of fiber and clothes production, uses a lot of water, chemicals and energy. Moreover escalation of fashion speed and industry-wide planned obsolescence (Choi et al., 2014) calls for alternative value appropriation mechanisms independent of material throughput, indicating the viability of use-PSS (Armstrong et al., 2015a; b).

The speed of fashion turnover is driven by multinationals such as H&M, Mango and Zarah whose superior supply chain coordination and agile manufacturing processes enable fast responses, making it possible to profit from trend fluctuations (Li et al., 2014). Rather than developing two annual collections new garments are introduced continuously to maintain floor traffic and consumers alertness (Cachon and Swinney, 2011). Post-consumer waste appears boosted by increasing speed (the average Swedish consumer throws away 8 kg of textiles each year (Carlsson et al., 2011) but garments are mainly pre-disposed at the back of the wardrobe (WRAP, 2015).

Against this backdrop stakeholders have pushed fashion firms to address this growing mass of wasted clothes and the idea of closing the loop, which is portrayed in slightly different vocabulary throughout the case companies' sustainability reports. This focus seems partly inspired by the Ellen MacArthur-foundation (EMAF, 2013), but also a pending Swedish government investigation regarding extended producer responsibility for clothes (Swedish Government, 2014). Nevertheless an infrastructure for used clothes, involving different charities, already exist in Sweden, however torn clothes still end up as household trash (Ekström and Salomonson, 2014).

## Case studies of Swedish fashion firms

Following Siggelkow (2007), this study uses case studies to illustrate and advance its conceptual argument, consisting of nine Swedish fashion firms and their value propositions (which include product-service systems, PSS). The cases were chosen according to two criteria, first propositions needed to entail PSS and second, firms should be relatively large in terms of turnover as this relates to the impact of their value propositions. The nine firms chosen contain, at the time of the studies, the best matches to these criteria. The list includes the four largest retail chains, multi-national Hennes & Mauritz (H&M) and national actors Kappahl, Lindex, Gina Tricot, smaller chain Indiska, as well as internationally acknowledged single brands Filippa K, Boomerang and Nudie Jeans. While Uniforms for the Dedicated (UFTD) is significantly smaller, it exemplifies a use-PSS.

While retail chains rely on physical stores mainly, single-brands sell their brands through multiple channels globally: other chains, shop-in-shops in department stores, and, various e-platforms. Business model frames the scope for implementing PSS, and the overarching sustainability strategy, as chains,

in particular H&M and Gina Tricot, pursue fast fashion (Barnes and Lea-Greenwood, 2006; Cachon and Swinney, 2011), whereas single brands position themselves as premium alternatives, thereby promoting style and quality to a higher degree.

Data regarding the cases were collected during 2015 by the researchers through four methods: semi-structured interviews with sustainability managers, open observations at store visits, collection and analysis of sustainability/social reports and collection and analysis of other online materials. These firms produce extensive material regarding corporate sustainability, including their version of sustainable consumption (SC). H&M for instance excels by their annual over 100 pages sustainability report. Interviews conducted by one of the researchers lasted between 30 and 60 minutes and were recorded and transcribed. All material was scanned to first identify value propositions directed towards consumers. Thereafter identified excerpts were coded as to what type of PSS they referred to. Lastly, and as displayed in the Findings section, these propositions were analyzed in terms of their suggestions for purchase, use and disposal. All quotes from interviews and reports presented below have been translated from Swedish where necessary. This translation has been cross-checked with a bilingual research colleague in order to be as close to the original meaning as possible.

Using data from multiple sources enabled us to triangulate the data to avoid relying on for instance possible idiosyncratic interview quotes. Moreover, as the interviewer was informed through multiple sources, he stayed aware of key themes and could likely determine if the respondents drifted into presenting personal, rather than, organizational viewpoints. On the other hand, those interviews were in most cases experienced sustainability-managers that were the ones that had the firmest grasp of their firms' value propositions. Hence, it is unlikely that there would be other informants that held alternative views on these propositions.

- Insert Table 2 here -

## Findings

For the purpose of ease of presentation the explored value propositions are averaged into two main elements: first a labeled offer of more sustainable materials and second some form of product-service systems (PSS; see Table 3). These examples are analyzed below in terms of their relations to the different parts of the consumption cycle.

- Insert Table 3 here -

### Purchase – sustainable materials and use-PSS

Sustainable materials are delineated in some diverse ways: Nudie Jeans for instance claim that all their jeans are made with 100% organic and fair trade cotton (Nudie Jeans, 2016). More commonly firms

rely upon internal classification systems, such as Gina Tricot's Good index, Filippa K's Fibre tool, or to follow an external one, as H&M does with the not-for-profit organization Made-by.

*The materials that we consider to be sustainable are organic cotton, Better Cotton, all recycled materials and some innovative materials such as Tencel and ProViscose. (Sustainability manager, Gina Tricot in Gina Tricot, 2015)*

Included in these classification systems are not only material characteristics but also process aspects. These parts of the product range are then labeled to communicate material properties to consumers, for instance as H&M does with its own Conscious label:

*Up until 2014, our Conscious label was limited to products made with more sustainable materials. Now it's no longer just the material choice that make our products more sustainable but also low-impact production techniques that reduce the use of water, energy or chemicals. (H&M, 2015)*

Another example is Filippa K, which in each collection produces a few "front runners of sustainability" that are produced according to several criteria, including being fully recyclable. Albeit these similarities among the retailers, their ambitions in terms of the value propositions can be discerned by firms' strictness in including materials, or the goals set to increase this share. Ambitions, in turn, impose a reciprocal demand upon consumers to incrementally get used to paying more for more expensive sustainable and recycled materials:

*[Prices] are significantly higher, not for all materials but for many. And that is one of the reasons that we have to do it stepwise, because we have to inform our consumers of the importance of them making these types of choices when they are buying our products, and there we have a responsibility to inform them but they are responsible for acknowledging that type of information and to be attracted by our products. (Sustainability manager, Indiska)*

Companies typically aim to increase the share of sustainable materials (defined by themselves or by third parties). For instance, Lindex intends to move from 22% to 80% by 2020 and H&M and Kappahl aim to increase their share of sustainable cotton from 21,2 % to 100 % by 2020. Here, recycled and recyclable fibers seem to constitute a recent addition to the list of materials. Newcomer UFTD focuses on recycled fibers, for instance wool, whereas incumbent H&M, through their brand Conscious, mixes in 20% recycled fibers but still only reach the total sustainable material share of 0.2% (H&M, 2015).

*And then we have to start using recycled materials to a larger extent and we have set a goal regarding the use of recycled materials in production. We have some such materials, it is easier with the type of products that we have, we have some interior decorating-products that are really totally recycled. (Sustainability manager, Indiska)*

The adding of recycled materials seemingly connects this part of the value proposition to the most common type of product-PSS, the take-back system. As seen in Table 3, all companies have implemented different variants of take-back. When take-back systems only accept the firm's own brand, take-back clothes can be either sold in second-hand corners (Nudie Jeans, Boomerang), or

designated second-hand stores (Filippa K), or recycled and used for new decorating products (Indiska, Boomerang, Nudie Jeans) as recycled fabrics are typically easier to use in rugs or furniture filling. Hence, the link between clothes handed back and recycled fibers reappearing in new garments, is ambiguous. Recycling is expensive and it is difficult to get useable fibers:

*We [the industry] have to find a joint way of getting the material back to our production countries and this is something that will demand new types of collaborations in the future. The technology needs to be scaled up and available in our production countries, and I think this is fully possible. (Sustainability manager, Indiska)*

While labels and materials seem to represent the main attempt to shape purchases, lately two examples of use-PSS have been introduced, in the form of short term leases (Filippa K and UFTD). These alternatives have received much positive attention, perhaps because they suggest something novel in relation to SC compared to the firm's own eco-labels. Use-PSS rather suggests that SC concerns ownership, and thereby introduces an innovative way of consuming fashion.

*We know that overconsumption is one of our largest challenges and then this [lease] is one way of offering our consumers a more sustainable way of consuming fashion. (Sustainability manager, Filippa K)*

The purchase-related question concerns whether consumers will choose use-PSS over pure product offers, but caution is expressed:

*Since this [lease] is brand new we have said that it is simply important that we offer it and then we have to be fully aware that it will take time. (Sustainability manager, Filippa K)*

Rather than purchasing clothes, leasing value propositions demand that consumers relinquish the benefits of ownership. The latter includes the value of expressing purchasing power, enjoying the social effect of wearing expensive brands or showing superior taste (Alvesson and Robertson, 2016; Corvellec and Hultman, 2014). On the other hand, this social effect could just as well be achieved through leased clothes, perhaps in a situation such as a job interview or at an important party, where it is particularly needed. Leased clothes are not new, so therefore an additional question concerns whether consumer will accept used, rather than new, garments:

*It has to be clean and fresh. There is no doubt about it. It does not matter if we are selling second hand or leasing, absolutely, hygiene is one important factor. (Sustainability manager, Filippa K).*

In addition to hygiene issues, the question arises of what happens to clothes that are left in the store after six months when collections are replaced. Ordinary garments are usually put on sale, but Filippa K has decided to keep these garments as a lease-wardrobe:

*Those garments will be there as long as they are in such condition that they can be leased. (Sustainability manager, Filippa K).*

Thus value propositions entailing leasing demand that consumers are ready to pay for used clothes, but also accepting clothes belonging to older collections. Filippa K, with a design philosophy emphasizing classic styles rather than contemporary trends is perhaps particularly suited for this focus:

*We offer a style rather than a trend by creating timeless pieces and wardrobe favorites that can be used season after season. (Social report, Filippa K)*

To summarize, when it comes to purchase, the exemplified fashion firms mainly understand sustainable consumption (SC) as related to sustainable materials (mostly firm labeled), but some variability is demonstrated through two examples of use-PSS.

### Consumer use – washing advice and repair

Firms offer two product-services regarding usage: most common is washing advice (including to not washing at all) but Nudie Jeans positions themselves by offering free repair through stores and repair kits (Egels-Zandén, 2016). Washing has sustainability implications, as it consumes both energy and water (Fletcher, 2013). Advice on how to wash is nothing new, but lately this advice has been framed in environmental terms, with firms offering different types of elaborate advice. Often these advice boil down to washing in 30 or 40 instead of 60 degrees Celsius and not tumble drying (H&M, 2015; Kappahl, 2015; Indiska, 2015). But Filippa K also sells an organic detergent and a fabric softener, purported to maintain textile quality and having lower environmental impact. Nudie Jeans has perhaps gone the farthest with extensive advice, promoted through booklets, social media and their web page, on how to break-in their jeans. The latter refers to a process of consistently wearing one's jeans, without having them washed, for at least six months. The point of the process is to adapt the denim fabric to one's own habits and turn it into a second skin, a narrative central to Nudie's brand identity. Thus arguments for lesser environmental impact (although less prominent) are paired with style argument to produce a unique value proposition.

In spite of these examples, generally the firms have less to say when it concerns use compared to purchase, as this is more in the hands of the consumer. For example, H&M, through their sustainability report, suggests that while use accounts for 26% of clothes' CO<sub>2</sub>-emissions, their own influence is low:

*Our challenge is to create affordable fashion that our customers will love from season to season and that is easy to care for in a low-impact way [...] Our aim was to develop a common standard care label that encourages consumers to care for their clothes in a more conscious way. The Clevercare label is now available to all apparel brands globally. Since 2014, all products of all brands within the H&M Group carry the label. (H&M, 2015)*

However, the responsibility can also be argued as being reciprocal, shared between consumers and firms:

*We have to help each other in order to make the clothes as sustainable as possible, but for you to help us, we will provide you with some good advice along the way. (Indiska, 2015)*

In relation to the problem of consumers not performing their part, use-PSS, in the form of clothes leasing, offers a solution as the consumer is relieved of responsibility for washing and caring for the clothes, since after lease the clothes are returned to the store and freshened up there.

### Consumer clothes disposal – eight take-back systems and a rag bag

The introduction of product-PSS in the shape of take-back systems is a relatively late addition to fashion firm's propositions of SC. Disposing clothes in this way is not more convenient than putting clothes in the household trash, but could nevertheless create consumer value, as the idea of providing treasured garments with a potential second-life is not without merit.

The scope of the take-back systems naturally differs with retail chain-size and whether all stores are included. While H&M collected 7,864 tons of used garments in 2014 and introduced take-back in stores all over the world, Kappahl started with take-back in 2015 and managed to collect 38 tons the first half year, and Lindex limited its collection to 50 of its stores. UFTD, who only runs two stores, instead offer a rag-bag, which consumers can use to send worn-out garments to charities.

Three different types of take-back exist among the case studies: 1) Handing over collected clothes to charities (UFTD: s rag-bag and Indiska, Gina Tricot and Lindex). The charity sorts garments and handles secondhand-sale or recycling. 2) Letting I:CO, an international recycling company (H&M and Kappahl) run the collection through putting boxes in their stores. I:CO then handles all further processing of garments. In these types, brands of other companies are accepted, along with broken and torn textiles. For type 2, consumers receive a voucher for their next purchase. 3) The single-brands, Filippa K, Boomerang and Nudie Jeans, run their own systems, accepting only their own brands and providing consumers with 15-20% discount on next purchase. Garments are further processed according to quality. Boomerang for instance resells items as vintage, recycles them for furniture, or passes them on to charities.

*Of course we want more [garments] handed back but I was particularly surprised at how much we manage to sell as second hand. [...] It suggests that we are getting good products back. (Sourcing manager, Boomerang)*

Since Swedes typically hand in used but functional clothes to charities (Ekström & Salomonson, 2014), take-back systems of the first type simply represent another channel for doing this. The second variant however represents something new as the proposition to hand back torn clothes is connected to the idea of recycling and advocated as part of SC. Despite the fact that only 0.2 % of their materials are recycled fibers, H&M writes on their offer of fashion for conscious consumers:

*Collecting unwanted clothes from our customers for reuse and recycling has taken us another step further. (H&M, 2015)*

Arguably, the actual prevalence of recycling within fashion is unclear, in particular as the operations of a private company such as I:CO lacks the transparency of comparable public waste operations. Moreover, for a multinational such as H&M, waste reduction will depend on the different waste infrastructures in the country where stores are located. At the same time, take-back systems of the third type, that only accept useable clothes of the own brand, have less potential in reducing waste as there are many alternative outlets for such garments. Still, single-brands' take-back might enable learning of how to design more durable or recyclable products, as companies can use these garments as informational inputs (Author and co-author, forthcoming). Designers could also become aware of how different materials or designs work, and how they age or break (Fletcher, 2013) and most fashion companies claim to incorporate sustainability in their design processes:

*At Lindex and in our design teams, sustainability involves everyone and it is something we take pride in. There is such a driving force and I never have to remind the designers to think sustainable. (Lindex head of design, cited in Lindex, 2015)*

Nonetheless, there is a major caveat to the sustainability of take-back systems. As has been mentioned, consumers tend to dispose of clothes in their own wardrobes thus the storage limits of wardrobes possibly limit consumption (WRAP, 2015). Take-back systems, in providing a voucher as an incentive, and perhaps also a sense of moral responsibility, urge consumers to empty their wardrobes and thereby provide room for new purchases, potentially speed up turn-over and material throughput, under the dubious pretense of enabling recycling. As mentioned, the value of the voucher received can only be realized through a new purchase, thus potentially driving even more fashion consumption.

## Concluding discussion

The purpose of this paper was to explore the use of value propositions that shape sustainable consumption (SC) through examples of product-service systems (PSS). As such value propositions from nine Swedish fashion firms of different sizes and with different takes on PSS were investigated and contrasted. The analysis shows how firms use different types of PSS (product, use and results oriented) to extend their offers to encompass the full consumption cycle from purchase, through use and, finally, to disposal of the clothes. Furthermore the analysis shows how the firms frame their value propositions to influence consumer behavior, e.g., through own eco-labels, washing advice and take-backs. These examples do not provide any generalizable value proposition for a universal construction of SC, at least not beyond firms with elaborated sustainability policies in the Swedish fashion industry. However, they do suggest some directions as towards how such firms' understanding of SC is developing in a time when sustainability has moved from the periphery to the core of many firms.

First, it appears as firms' are extending their definition to go beyond promotion of eco-labeled products to also engage in measures to address use and disposal. To achieve this, some types of PSS seem central, such as product-PSS where take-back of clothes become part of value propositions.

Second, in focusing on use and disposal, the involvement of the consumer is apparent. Hence, elements of reciprocity and mutual responsibility between firms and consumers are central and framed in a new way. With eco-labels (firms' own or third party certified) consumers are asked to do their part by (most often) paying a higher price and accepting claims regarding added value, for instance the sustainability of different materials (Peattie, 2001). As SC is defined as encompassing use and disposal as well, consumers' responsibility extends in new ways to additional behaviors. Interestingly, value propositions of use-PSS, in the form of cloths leasing, seem to suggest a way to relieve consumers of this newfound responsibility (such as washing in a less environmentally impactful way and repairing clothes themselves). Hence, while the PSS literature suggests that use-PSS reduces consumer freedom (Tukker, 2015), it could also bring relief from responsibilities imposed by more sustainable consumption practices. In this sense, giving consumers access to the possibility to share products with other consumers (e.g., Belk, 2014) might be a value proposition that could attract more consumers if aspects concerning ease of responsibility were focused more in communication.

Third, this case study clearly suggests a similarity between what elements firms include in their value propositions such as sustainable/recycled materials, washing advice and take-back but also differences concerning the precise definition of these elements. Thus firms exhibit different levels of ambition, knowledge, but perhaps also courage in challenging current consumption norms and reigning business models. Hence, there is similarity of what elements to include, but some variability in how these elements are elaborated. Still newcomers such as UFTD, but also Nudie Jeans, with their free repairs, and Filippa K with their lease ambitions, stand out by trying more innovative approaches than the others. Arguably how propositions of SC are shaped in an industry has to be understood partly as an outcome of interorganizational dynamics, where firms observe each other and signal their level of ambition by taking relative positions. Especially when there is uncertainty regarding proper action, in this case as the proposition of SC is extended to use and disposal, there is likely to be strong isomorphism at the level of firms' policies and goals, but varying degree of practice similarity (Boxenbaum and Jonsson, 2008).

Based on the above discussion the study makes the following contributions: First, the paper shows a practical example of the importance of understanding unfolding value propositions in shaping SC, contributing to knowledge of firms' role for these practices and providing analytical clarity focusing on purchase, use and disposal. Second, it suggests how SC is evolving to encompass use and disposal, and provides examples of this. Lastly it also contributes to the PSS literature by showing how different PSS are used to complement and extend value propositions regarding SC in a specific sector where environmental impact, due to high material throughput, is high.

## Implications for business, industry and sustainable development

From this study follows primarily three business and industry implications. Firstly it is clear that in the textile industry (and very likely in other business to consumer industries as well) it is currently of utmost importance to operationalize concepts such as sustainability and sustainable development so that they become value-adding proposition instead of value detractors to the core product offering. This is based on the developing notion that consumer green products need not only be more sustainable than their conventional alternatives, but they need to be at least equal or preferably better in core aspects as well (Papista and Krystallis, 2013; Patala et al., 2016). Secondly and related, firms targeting consumers with PSS offerings currently have realized the potential of branding these initiatives so that they are intimately linked to the brand instead of offering generic value to the industry. Although this drives innovation and differentiation and opens possibilities for exploring new sustainable value propositions, these initiatives also run the risk of fragmenting the industry and thus the aggregated industry potential for sustainability in terms of efficiency might decrease. Industry organizations in different sectors, such as in the textile industry, are thus wise to monitor and facilitate system wide changes where possible. Thirdly, it is important to note that the textile industry with its signature fast fashion image is likely at the front of developing these systems due to severe critique over social and environmental practices over the years. Other businesses and industry sectors can learn from critically analyzing the textile industry methods related to PSS implementation especially concerning how value propositions are developed and communicated to consumers. However, the sustainability impact of these systems are still likely negligible cautioning against too far reaching conclusions of their future impact both in absolute sustainability terms and as industry role models. Businesses interested in strong sustainability rather than weak, likely need to approach sustainable consumption from a holistic perspective integrating not only PSS into their strategies but also other aspects of social and environmental sustainability (e.g., Hopwood et al., 2005; Vallaster et al, 2012). This since scrutiny from other stakeholders is likely to increase as the sustainability issues become even more pressing.

In terms of implications for sustainable development it should be mentioned that while firms' definitions of SC likely gain influence in practice, these definitions may still be problematic in relation to strong versions of SC (Lorek and Fuchs, 2013). As mentioned, voluntary take-back systems evoke certain caveats and may ultimately legitimize increased material consumption through dubious assertions of recycling. This can be thought of as a rebound effect (e.g., Berkhout et al, 2000) where gains in recycling technology systems, is offset by increased acquisition among existing and potential consumer groups. The propositions made by firms seemingly enable consumers to perceive a way to consume more sustainably, and as this perception may be the ultimate goal for the firms, collection boxes may have symbolic rather than real effects, functioning primarily as devices to substantiate such claims instead of devices to actually enable effective recycling and thus less environmental impact.

This is then more in line with a weak SC approach where voluntary measures like these are one of the methods pointed to in the literature (e.g., Hobson, 2013). A policy approach more in line with strong SC would be to force firms to implement take-back systems through regulation and thus extend producer (and seller) responsibilities into the disposal stage of the consumption cycle. Another related policy suggestion would be closer monitoring of the take-back systems at an aggregate level to follow material throughput on a systems scale. Although such regulations might meet resistance from an industry perspective, from a sustainable development angle, it would likely be more beneficial. In general, the implications for sustainable development of PSS are not clear-cut which warrant studies that also investigate PSS in close relation to the context in which they are developed. Thus further studies in other business sectors and in other countries where industries view sustainability differently and have implemented other PSS from this Swedish case are important. This would also generate further insights into the consumer aspects of PSS concerning perceptions and long term influence on consumption practices.

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## Tables

Type of PSS	Consumption stage		
	Purchase	Use	Disposal
<b>Product-oriented services</b>	+/- Appreciate the value of future service provision	+/- closer relationship with provider (Tukker, 2015) + Increased functionality (repair, maintenance, advice etc.)	+ Help with disposal
<b>Use- and results-oriented PSS</b>	- Appreciate used rather than new products (Intlekofer et al., 2010) +/- New payment models, for instance subscription or paying-per-use	- Less control/flexibility (Tukker, 2015) - Hygiene, privacy, intimacy issues (Armstrong et al., 2015; Catulli, 2012) - Conflicts with norms and culture (Armstrong et al, 2015) +/- Closer relationship with provider (Tukker, 2015) + Not having to care about performance, maintenance, repair or storage (Heiskanen & Jalas, 2003; Vezzoli et al., 2015)	- Leasing implies returning products + No responsibility for disposal

**Table 1: Implications for consumers as suggested in the PSS literature**

<b>Business model</b>	<b>Companies</b>	<b>Turnover<sup>1</sup></b>	<b>Data collection</b>
Integrated retail chains	H&M, Kappahl, Lindex, Gina Tricot, Indiska	H&M 11 726 Kappahl: 386 Lindex: 351 Gina Tricot: 226 Indiska: 83	Sustainability reports (all, 2015, circa 350 pages) Online material (all five web pages included) Store visits (all five stores visited in at least two locations each) Interviews (Indiska, 1 hour)
Single brands	Filippa K, Boomerang, UFTD, Nudie Jeans	Filippa K: 56 Nudie Jeans 41 Boomerang: 13 UFTD: 1	Social reports (Filippa K and Nudie Jeans, circa 50 pages) Online material (all four web pages included) Interviews (Filippa K, 1 hour; Boomerang, 1 hour)

<sup>1</sup>In thousand EURs, for fiscal year 2014 except for UFTD: 1st May 2014 to 31st April 2015.

**Table 2: Case studies conducted**

Stage of consumption-cycle	Activity	PSS type	Company
Purchase	Offer garments made out of sustainable materials	No PSS	All
Purchase, use	4 day lease of all clothes <sup>1</sup>	Use-PSS	Filippa K
Purchase, use	3 or 7 day time-share of selected items <sup>1</sup>	Use-PSS	UFTD
Use	Washing advice	Product-PSS	All
Use	Break-in advice	Product-PSS	Nudie Jeans
Use	Free repair	Product-PSS	Nudie Jeans
Disposal	In-store take-back accepting only own brand	Product-PSS	Filippa K, Boomerang, Nudie Jeans
Disposal	In-store take-back accepting all brands (I:CO)	Product-PSS	H&M, Kappahl
Disposal	In-store take-back accepting all brands (with charities)	Product-PSS	Lindex, Indiska, Gina Tricot
Disposal	Mail take-back (with charities)	Product-PSS	UFTD

<sup>1</sup>For 15-20 % of full price

**Table 3: PSS examples among studied Swedish fashion firms**