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Predicting Consumer Adoption of Branded Subscription Services: A Prospect Theory Perspective

Abstract

Drivers of and barriers to consumer adoption of product-service systems (PSS) deviating strongly from the current consumption paradigm remain unidentified. This study quantitatively investigates purchase intentions of a hypothetical branded fashion subscription service. This service features use- and result-oriented PSS attributes in a lack of ownership, newness, and choice, and is investigated from a Prospect Theory perspective using a mixed method design combining an experiment with a survey (n=524). Results show that even if the PSS provider is highly trusted by consumers, this only mitigates some of the worries consumers have about wearing used clothing and being held financially liable for product damage. The only driver of adoption is the opportunity to save money. Additional specific product information is also explored and shows that PSS providers have scope to change consumer perceptions. Overall, it appears that in fashion ownership and choice are lesser issues than the literature suggests, although financial incentives are important. Furthermore having a trusted brand allows a potential PSS provider to alleviate only some of the concerns consumers have. The contribution of this paper lies in its empirical findings as well as in its validation of Prospect Theory as a valid approach to enquiring into reasons for or against consumer adoption of complex PSS such as subscription services.

Keywords: Subscription services; product-service systems; consumer adoption; sharing economy; collaborative consumption; fashion

Introduction

Driven by concerns about resource scarcity and pollution resulting from the current take-make-use-dispose paradigm of industrial production and consumption, the circular economy seeks to achieve continuous cycles of maintenance, repair, reuse, refurbishment and recycling (Ellen MacArthur Foundation, 2014). To enable such cycles to be commercially feasible while making use of 'tighter' cycles of repair and reuse, researchers and practitioners have turned to the concept of product-service systems (PSS) as a concept to facilitate the innovation of sustainable business models (Evans et al., 2017). While previously largely discussed in business-to-business (B2B) contexts and related to Servitisation (Lightfoot et al., 2013), more recent studies on PSS take a Consumer Studies perspective instead. Here PSS are understood to be a potential opportunity for greater sustainability that seeks to align provider, consumer and wider environmental interests (Tukker, 2015).

PSS are defined as a

> *'system of products, services, networks of actors and supporting infrastructure that is developed to be competitive, satisfy customers and be more environmentally sound than traditional business models'* (Mont, 2002, p239)

These product-service bundles and their underpinning business models are conceptualised along a spectrum according to whether value is predominantly bound in the tangible product or intangible service. Here a broad distinction is made between product-, use- and result-oriented PSS (Tukker, 2004). Along this spectrum, product ownership with added-on maintenance or support services is typical of product-oriented PSS. Temporal access and use rights and ownership-less consumption are defining characteristics of use-oriented PSS. Companies seeking to meet customer needs directly through selling a previously specified output are termed result-oriented PSS (Tukker, 2004). Environmental gains are expected to increase along this spectrum as providers are motivated to dematerialise value delivery and design remaining physical assets to be maintainable, repairable, and

efficient during use. More recently, hybrid types of PSS have emerged in practice and discussed in academia that integrate mechanisms from several types of PSS to form a more rounded and context-specific offering (Catulli et al., 2017; Cook, 2014).

The success of sustainable PSS in business-to-consumer (B2C) markets has been limited (Tukker, 2015) and exceptions tend to focus on temporal consumer needs and consumer personas with narrow use-regimes such as car-sharing providers (Lee et al., 2015; Poppelaars et al., 2018). One reason for the lack of success of more radical PSS on the service side of the spectrum in larger markets is a seemingly low willingness of consumers to adopt them. Recently studies taking the consumer perspective have shed light on which factors are crucial for adoption as outlined in the following.

Here two gaps have emerged in this literature. Firstly, while these studies have advanced the understanding of the range of drivers and barriers to consumer adoption, the relative importance of these is unknown as initial studies have largely utilised qualitative approaches (e.g. Catulli et al., 2017a, 2017b; Cherry & Pidgeon, 2018; Linder & Williander, 2017; Poppelaars et al., 2018; Rexfelt & Hiort af Ornäs, 2009). In the case of quantitative studies, scholars have divided their attention between a number of different PSS options to map which barriers affect which PSS configurations (e.g. Armstrong et al., 2015, 2016; Catulli & Reed, 2017; Tietze et al., 2015). The most impactful drivers of consumer adoption remain unknown (Tukker, 2015) and adoption of more ambitious PSS 'remains a black box' (Vezzoli et al., 2015, p6).

Secondly, past studies have assumed trust in the PSS provider to be an important prerequisite for consumer adoption as the uncertainty caused by the new and otherness of such offers dissuades adoption. However, it is also assumed that a provider could alleviate concerns about the PSS via a trusted brand and by providing more product information (Chian Tan et al., 2017; Rexfelt & Hiort af Ornäs, 2009). This assumption has not been investigated empirically. Therefore this study assesses to what extent more definite product information from a trusted PSS provider could alter perceptions about the offer. This is because product information has been shown to improve consumer adoption intentions in other cases where products include an element of risk (Wang & Hazen, 2016).

The obejctive of this paper is therefore to act as a platform through the previously identified gaps in the literature can be closed. This study investigates the consumer adoption of a fashion PSS case featuring elements of both use- and result-oriented PSS, which represents a hybrid type of PSS reflecting the diversity of offers emerging in practice (Cook, 2014). This PSS is described as a fashion subscription and is offered by an established fashion retailer seeking to diversify its revenue stream by offering medium-term subscription based renting services to consumers. The service is configured to allow the provider to choose clothing items to be rented out for a specified amount of time based on an incomplete set of consumer preferences. This flexibility on the provider's part increases asset utilisation to improve the environmental performance of a product that is plagued by a myriad of environmental and social issues (Caniato et al., 2012) which make the growing fashion and apparel industry one of the largest polluters globally in both absolute and relative terms (Gwozdz et al., 2017).

From a theory perspective this paper contributes to the growing stream of literature on consumer adoption of PSS by providing a theoretical underpinning in Prospect Theory that may be adapted to systematically and quantitatively predict the purchase intention choices of PSSs, as opposed to mapping the complexities of PSS use through sociology of consumption and Practice Theory approaches (Mylan, 2015) or Consumer Culture Theory (Catulli et al., 2017). From an empirical perspective, drivers of and barriers to consumer adoption in a PSS case combining the three key mechanisms responsible for sustainability gains, which are lack of newness, ownership and choice, are investigated. The intervening effect of trust in the provider is parcelled out, assuming that market incumbents with a large trust capital are the most likely PSS providers for mass markets due to their brand strength and existing resources and skills (Ellen MacArthur Foundation, 2014).

The paper will therefore, in 'Consumer Adoption of PSS', review the existing literature on consumer adoption of PSS from which a Prospect Theory framework will be developed in 'Application of Prospect Theory in PSS Adoption'. Afterwards this framework will be applied to the case detailed above, and hypotheses made to determine consumer adoption will be developed in 'Context of the Study and Hypotheses Development'. 'Research Design' will describe the research design as a

survey experiment. This is followed by ‘Results’ before the findings of this study are reflected on in ‘Discussion and Implications’. A brief conclusion, supplemented with study limitations and future research opportunities is given in ‘Conclusion and Future Research’.

Consumer Adoption of PSS

Initially the attractiveness of PSS to consumers was seen as a major driver for the diffusion of PSS and similar offerings, such as hybrid or functional solutions, in early publications (Mont, 2002). However it quickly became apparent in the PSS and related fields in the circular, sharing, and service economy, as well as collaborative consumption, that individual consumers do not follow the same utilitarian rationale that helped PSS to become successful in B2B contexts (Meier et al., 2010).

Therefore, despite product-oriented PSS having become relatively mainstream as manufacturers of goods have realised the benefits of limited degrees of servitisation, it is observable that the more ambitious use- and result-oriented types of PSS remain sparse in practice (Tukker, 2015). Initial optimism arguing that ‘users can be liberated from the burden of owning’ (Kang & Wimmer, 2008, p1149) and that firms would be able to leverage their greater insight to provide consumers with PSS that satisfy needs more precisely and therefore at lower financial and environmental cost (Tukker & Tischner, 2006) has since dissipated. The consternation on the provider side to this issue, which in Överholm’s (2017) case study of solar service firms leads to the claim by a PSS provider that ‘it’s difficult to sell a no-brainer’, has been juxtaposed with a series of studies looking at what consumption of a use- and result-oriented PSS actually entails in practice.

Here Rexfelt and Hiort af Ornäs (2009) take an Activity Theory perspective to conduct interviews and map a decision-making process that consumers undergo, during which the offer is grasped, the consequences of opting for a PSS over conventional alternatives are predicted, a need congruence is predicted, and lastly a decision is made based on the perceived attractiveness and risks of the PSS. During this process consumers are acutely aware of uncertainties – for example whether the PSS can be integrated into existing and cherished patterns of acquisition,

consumption, and disposal. Mylan (2015) explores this perspective further through a Practice Theory lens and focuses on how practices evolve on a collective level using the example of energy efficient lightbulbs and washing clothes at low temperatures, asserting that PSS acceptance hinges on how the usage of such offers fits with collectively established practices. Later Catulli et al. (2017) proposes a Consumer Culture Theory approach that explores individual choice of PSS and the different dimensions of value-in-use of a PSS. Studies from both theoretical angles focus more on usage of PSS in everyday consumption than the decision-making process at point of sale.

Looking at classical models of consumer decision-making explored in the context of PSS, Poppelaars et al. (2018) assert that a consumer determines during an initial adoption phase whether to buy an (unfamiliar) PSS, and a later acceptance phase whether to continue using the PSS. The use Practice and Consumer Culture Theory have benefitted understanding the latter more than the former as not all insight from about value-in-use may also be known to the consumer when considering first purchase. This means that less work has been done with an explicit focus on adoption.

In the context of fashion, product-oriented PSS are well conceptualised and common in practice, inncluding cases such as providing maintenance, financing and customized design servicees (Armstrong et al., 2015). Use-oriented PSS explore mechanisms through which fashion products can be made accessible to multiple users for periods of time and thus extend product lifecycles (Armstrong et al., 2015; Park & Armstrong, 2017). Typical examples include product leasing, renting and sharing schemes (Retamal, 2017), with more nuanced typologies emerging in practice and discussed in research (Park & Armstrong, 2019). Result-oriented PSS are a more niche phenomenon, including services that meet consumer desires to be well dressed for a certain event with the provider having considerable power over his this need will be met (Armstrong et al., 2015) or that a toddler be clothed according to their height and the current season (Petersen & Riisberg ,2017).

Through these studies from the fashion context and other studies from B2C examples of PSS, three dominant themes can be synthesised. The first of these themes relates to the lack of newness of the product component of the PSS with

ensuing worries about its performance, a perceived social stigma or lesser satisfaction (Tukker, 2015). These concerns are particularly strong when being perceived to endanger health, for example in the case of prams in potentially dirty or damaged condition (Catulli & Reed, 2017), or when used in identity construction projects (Armstrong et al., 2015; Santamaria et al., 2016).

Secondly the lack of ownership, which is perceived to cause a loss of control and autonomy, prevents full integration of the product in practices which include emotional attachment, or create worry about being held accountable for product damage caused during use (Cherry & Pidgeon, 2018; Retamal, 2017). There is a notion that the relationship created through temporary access rights instead of full ownership rights might be used by the provider to exploit the consumer with little opportunity to prevent such behaviour by the provider as rights and obligations may not be exhaustively defined ex ante (Rexfelt & Hiort af Ornäs, 2009; Tietze et al., 2015).

While these previous points are made in relationship to use-oriented PSS that include sharing, renting, and other offers based on temporary access, a third issue affecting result-oriented PSS is the lack of choice. Consumers are unsure whether a PSS provider is able to provide their needs in a satisfying manner (Armstrong et al., 2015; Petersen & Riisberg, 2017). This point focuses on the service component in particular and the mechanism that could incentivise providers to design products in a more durable, upgradable, and satisficing manner, with potentially significant environmental savings (Tukker, 2015).

Similarly, a number of selling points have been identified, which include lower costs as temporary needs can be met by buying temporary access to a good, which enables the provider to generate revenue from products multiple times. A better environmental performance, meeting consumer desires for frequent change, or value-adding services such as consulting services regarding optimal produce choice and use are also mentioned (Armstrong et al., 2015; Retamal, 2017).

Finally, it has been found in these studies that trust acts as a potential mitigator of concerns or assurances regarding expectations. It is assumed that should the PSS provider be trusted by the consumer, the previously mentioned worries and

expectations would be alleviated or assured as the provider would design and deliver the PSS in a manner that meets the diversity of consumer needs and preferences (Rapaccini & Visintin, 2015). Studies show that successful PSS providers invest in the development of trust through a variety of means that relate to the design, provision, and marketing of the PSS (Chamberlin & Boks, 2018; Chian Tan et al., 2017).

Application of Prospect Theory in PSS Adoption

These findings on consumer adoption of PSS fit with how Prospect Theory has been applied in the area of decision-making under uncertainty to predict consumption choices in deterministic settings (Kahneman & Tversky, 1983; Thaler, 1980). According to Prospect Theory, individuals undervalue less probable outcomes in comparison to more probable outcomes. Individuals therefore tend to be risk-seeking in the areas of possibly large losses or small gains, and risk-averse when faced with potentially large gains or small losses. Following this, risk is considered disproportionally and plays a larger role in the decision-making process, which separates Prospect Theory from Expected Utility Theory as 'consumers weigh losses from a reference point more than equivalent sized gains' (Hardie et al., 1993, p379).

To arrive at consumption choices individuals undergo a two-step process during which the set of possible prospects are defined based on available information (editing). Subsequently a value is attached to each prospect which takes into account individual preferences (evaluation) (Puto, 1987). A rational individual will then choose the prospect with the largest value.

The set of prospects formed during the editing stage is the basis for the subsequent evaluation and choice. It has been found that imparting information can alter prospects to make a certain choice more likely, as the gap between an ex ante reference point and prospect is narrowed (Burton & Babin, 1989; Levin & Gaeth, 1988). More recently Wang and Hazen (2016) for example found in a study underpinned by Prospect Theory that consumers with more product knowledge of remanufactured engines expected such engines to have fewer quality issues than consumers with less product knowledge, and were subsequently more willing to

adopt them. Marketing communications of PSS providers have created several devices to achieve this which may range from simple information to deliberate framing (Chamberlin & Boks, 2018; Petersen & Riisberg, 2017). In the case of PSS it can therefore be hypothesised that providing additional product information can alter the evaluation to result in prospects conducive to adoption.

Given that in consumer choice contexts the decision is to adopt a product, the prospect values assigned during the evaluation stage are based on considerations about perceived value and risk which have been shown to be influential previously. Here perceived value refers to expectations about satisfaction generated from making a consumption choice and a superior perceived value is associated with adoption intentions (Sweeney & Soutar, 2001; Yang & Peterson, 2004). As such, comparative benefits of PSS over conventional alternatives are hypothesised to increase value perceptions and contribute to adoption intentions.

Risk perceptions, however, may reduce adoption intentions as undesirable consequences of adopting a novel product also factor into the decision-making process, acting as barriers to purchase (Bauer, 1960) This has been attributed to worries about losses arising from consumption choices (Dowling, 1986). Perceived risk is therefore defined as the ‘subjective expectation of losses’ from product purchase and use (Dholakia, 1997, p161). This has been shown to be an impactful determinant of adoption in other contexts (Featherman & Pavlou, 2003). In the case of PSS, these perceived risks are not made with reference to conventional alternatives however, as these do not feature the same risk sources – for example as the physical condition of a new store-bought item is not expected to show signs of wear-and-tear from previous use.

Context of the Study and Hypotheses Development

One context in which the adoption of PSS by consumers has been explored via a series of qualitative studies is fashion and apparel. Here Armstrong et al. (2015, 2016) and Rexfelt and Hiort af Ornäs (2009) look at a number of hypothetical PSS that are discussed with consumers to explore benefits and drawbacks. Retamal (2017), Corvellec and Stål (2017) and Stål and Jansson (2017) have undertaken

studies on a number of providers of different existing fashion PSS, while Petersen and Riisberg (2017) studied the provider of a fashion subscription in Denmark. Chamberlin and Boks (2018) assess how PSS providers use marketing communications to influence adoption intentions. This focus on fashion can on the one hand be explained by the large negative environmental impact of apparel products at every stage of their life cycle (Gwozdz et al., 2017). On the other hand there have been collaborative consumption business models in fashion sharing attributes with PSS in a number of European countries that have experienced success in their respective niches for some time. Examples here are fashion libraries or clothing swaps (Pedersen & Netter, 2015). A number of companies are seeking to grow these business models online to make them more widely accessible and competitive beyond the environmentally and socially conscious clientele of urban fashion libraries (Park & Armstrong, 2017).

To investigate the impact of the three issues around lack of ownership, lack of choice, and lack of newness on consumer adoption intentions, a hypothetical fashion subscription offered by an existing retail brand was developed. As such, the hypothetical fashion subscription examined in this study corresponds to a strategic decision by an existing fashion brand to branch out into subscription-based rental services rather than a specialised subscription retailer focusing exclusively on private label clothing.

This PSS, subsequently referred to as a fashion subscription, allows consumers to submit preference sets in terms of price levels, size, and desired types of clothing in an online store. Afterwards clothes matching these preferences are delivered to the consumer on a recurring 30 day basis, after which they are to be sent back to the provider and fresh clothes are delivered. The cost of the subscription varies with the type and number of clothing items subscribed to. A return policy is in place to disincentivise damage or failure to return items to maintain the stock of products and promote financial and environmental feasibility, which mirrors comparable subscription business models analysed previously (Petersen & Riisberg, 2017; Retamal, 2017). The following hypotheses are developed using Prospect Theory's underpinninng structure in an editing phase based on available product information

and subsequent evaluation of determinants of the purchase decision according to individual preferences.

Perceived Value Hypotheses

Such a fashion subscription could offer several benefits over the conventional modus operandi of consuming fashion products, which can be conceptualised as perceived values, as 'relative advantages for consumers [will] be the main driver for the diffusion of PSS' (Rexfelt & Hiort af Ornäs, 2009, p676).

One dimension of perceived value that has been claimed to spur the adoption of PSS in general (Tukker, 2015) and fashion PSS in particular due to the commoditisation of apparel through fast-fashion consumption patterns is the potential to save money. Here consumers assume that PSS providers could offer PSS cheaper than a one-time purchase as revenue can be extracted through several use-cycles (Armstrong et al., 2015). This is in line with findings that cost is an important contributor to perceived value and is considered strongly in purchase decisions (Sweeney & Soutar, 2001).

H1: Perceived cost benefit value (PCBV) is positively related to purchase intention.

Another perceived value emerging from the fashion subscription stems from the role fashion plays for consumers in renewal and identity-building projects. The PSS presents consumers with access to a wider variety as they have only limited control over which items they will receive. This could tie in with a desire for renewal and change that is reflected and expressed through clothing (Armstrong et al., 2016; Niinimäki, 2010). As the choice is made by the provider, the consumer is encouraged to try out and perhaps enjoy wearing items that would have been overlooked under normal circumstances (Retamal, 2017).

H2: Perceived variety benefit value (PVBV) is positively related to purchase intention.

Adoption of the fashion subscription would also reduce the production and disposal of new fashion items, which in turn would reduce associated burdens on the environment. As qualitative studies have shown that consumers seem to take this into account when talking about fashion PSS, a third perceived value of the fashion subscription is its superior environmental performance (Armstrong et al., 2015; Petersen & Riisberg, 2017). The assumption that PSS could tap into an emerging green consumer culture also featured early in the development of the field (Chian Tan et al., 2017; Mont, 2002).

H3: Perceived environmental benefit value (PEBV) is positively related to purchase intention.

Perceived Risk Hypotheses

In terms of perceived risks, a variety of studies has shown that consumers worry about the physical condition of textile items that have been used previously, and this relates to fashion as well as to prams (Catulli & Reed, 2017; Retamal, 2017). This reflects prevailing negative attitudes towards 'not new' items – the lack of newness theme related to use-oriented PSS that cycle physical products. Both damage to the fabric itself through wear-and-tear, as well as considerations around hygiene and cleanliness are cited here (Catulli et al., 2017b). It can be expected that worries about the physical condition of items delivered through the fashion subscription reduce consumers' willingness to adopt it.

H4: Perceived physical condition risk (PPCR) is negatively related to purchase intention.

Another aspect that has been shown to worry consumers in result-oriented PSS that leaves the selection of the product component to the provider is that the product does not meet the consumer's preferences or is in some way not fit-for-purpose. This has also been shown in fashion (Armstrong et al., 2015, 2016) and refers to the lack

of choice of result-oriented PSS. In the context of the fashion subscription this would be reflected in receiving clothing that does not meet the preferred style or size of the consumer, reducing the attractiveness of the offer (Petersen & Riisberg, 2017).

H5: Perceived style preference risk (PSPR) is negatively related to purchase intention.

While PSS have been claimed to offer increased convenience to the consumer as providers undertake some of the duties in product acquisition and disposal (Poppelaars et al., 2018), this may also become a drawback depending on the context. In the context of fashion, Armstrong et al. (2015) find shopping as an activity in itself brings satisfaction to consumers as it fulfils needs around renewal and socialising, common also in fashion library contexts (Pedersen & Netter, 2015). A fashion subscription would essentially prevent satisfaction gained from these activities as they undertaken by the provider or mitigated by the lack of social interaction becausee of a highly anonymous consumer-consumer relationship (Park & Armstrong, 2017).

H6: Perceived shopping opportunities risk (PSOR) is negatively related to purchase intention.

Lastly, the issue of ownership can be reflected in two types of perceived risk, referring to the lack ownership aspect stemming from the use-oriented PSS component of the fashion subscription. An initial issue is the sacrifice a consumer is expected to make upon return of the items to the provider (Catulli & Reed, 2017; Tukker, 2015). This is more of an emotional drawback of ownership-less consumption. As attachments are formed with items through experiences during use, relinquishing these may become difficult. This has also been cited in clothing (Armstrong et al., 2015) as material possessions are expressions and extensions of identity. More recently, Park and Armstrong (2019) specify this further and show that the endownment effect is a major deterrent of collaborative consumption when ownership is removed because a sense of ownership and possession-self

association is impaired. From this angle, relinquishing posessions becomes Another issue here is the liability that consumers have for products they use but do not own and must return (Cherry & Pidgeon, 2018). This is connected to a sense of loss of control and a dependency on the goodwill of the provider as the consumer may feel to be in a weak negotiating position should the provider take issue with the condition in which clothing is returned. This could result in the expenditure of more time and money than was originally envisaged (Reim et al., 2015; Retamal, 2017; Rexfelt & Hiort af Ornäs, 2009). Both perceived risks stemming from ownership-less consumption can be hypothesised to reduce the attractiveness of the fashion subscription.

H7: Perceived return sacrifice risk (PRSR) is negatively related to purchase intention.

H8: Perceived return liability risk (PRLR) is negatively related to purchase intention.

Hypothesised Product Information Effects

The fashion subscription analysed in this paper is hypothetical and unfamiliar to the respondents of this study. It is therefore also hypothesised that additional product information could reassure consumers that perceived values would be delivered and alleviate sources of perceived risk. This is in line with findings that purchase decisions involving risk can be influenced through information during the editing stage of Prospect Theory (Creyer, 1997). This mirrors consumer desire for more information on PSS exhibited in qualitative studies to reduce uncertainties (Catulli et al., 2017b; Överholm, 2017; Poppelaars et al., 2018), which has also been observed in practice, although it is not known to what effect (Chamberlin & Boks, 2018; Chian Tan et al., 2017).

Based on this, four types of product information are hypothesised to be conducive to purchase intention.

Firstly, consumers have displayed worries about whether PSS would actually be cheaper, especially in cases where consumers are used to buying products outright (Armstrong et al., 2015; Hannon et al., 2015). It seems that consumers struggle to

compare the pricing mechanisms of PSS with their conventional alternatives, which makes them underestimate the potential cost benefits of PSS (Vezzoli et al., 2015).

H9: Additional cost-related product information is positively related to perceived cost benefit value.

Secondly, research indicates that consumers have difficulty weighing up the total environmental performance of PSS (Vogtländer et al., 2002), for example because the environmental cost of producing and disposing of textile products is underestimated in comparison to the environmental cost of moving products (Gwozdz et al., 2017). This is also because the actual environmental benefit depends on the configuration of the PSS in question (Tukker, 2015). Additional product information could reassure consumers of the superior environmental performance of the fashion subscription as it reduces the production and disposal of new clothing through re-use.

H10: Additional environmental-related product information is positively related to perceived environmental benefit value.

Thirdly, consumers may worry about the physical condition in which used products are delivered to them as there is uncertainty about which standards can be expected from products that are marketed as ‘not new’ (Tukker, 2015) and product histories are unknown (van Weelden et al., 2016). This may be alleviated by giving more specific product information to ease perceived risks (Catulli et al., 2017b) as ‘a lack of understanding and knowledge of refurbished products fosters low quality perceptions’ (van Weelden et al., 2016, p744).

H11: Additional physical condition-related product information is negatively related to perceived physical condition risk.

Fourthly, while consumers are aware that relinquishing the control of choice regarding the product component of the PSS represents a source of risk (Tukker,

2015), additional product information could reassure consumers that their individual preferences can still be considered to some extent even if the provider makes the final choice. In the case of the fashion subscription this can be determined by the detail which consumers can submit regarding size and style preferences (Petersen & Riisberg, 2017), which providers in fashion PSS also consider in practice when offering a wide variety of clothing (Retamal, 2017).

H12: Additional style preference-related product information is negatively related to perceived style preference risk.

Lastly, account must be taken of the overwhelming importance of trust in the PSS provider in the adoption of PSS reported in previous studies (Armstrong et al., 2015; Catulli et al., 2017b; Cherry & Pidgeon, 2018). This has been taken into account in the experimental research design outlined below. As such these hypotheses are investigated while controlling for trust in the provider and testing for the effect of age, education, and income.

H13: Trust in the PSS provider is positively related to purchase intention.

The theoretical framework resulting from these hypotheses is depicted in Figure 1.

<Insert Figure 1 here>

Figure 1: Theoretical framework employed in this study.

Research Design

The theoretical framework was investigated using two methods combined in a single data collection phase. These two methods are structural equation modelling (SEM) to test hypotheses on the determinants of purchase intention, and t-tests in a between-groups full-factorial experimental design (Montgomery, 2009) to test hypotheses related to product information.

As four types of product information regarding the fashion subscription were hypothesised about, a 2^4 design resulting in 16 experimental groups was adopted. This enabled allocating the 16 experimental groups into 8 cohorts to according to whether participants had or had not received a particular product information treatment. As the distribution of the other product information treatments was similar across the cohorts, respective differences between the cohorts must then be assumed to be caused by the particular product information treatment.

Study participants, measures, data collection, and pre-testing are described in the following.

Participants

Given the critique levelled by Rapp and Hill (2015) and others against the use of random or student samples in marketing research, it was decided to recruit participants that represent the most probable customers of the hypothetical fashion subscription. Following Armstrong et al.'s (2015) logic, British women between 18-39 years old were recruited online. This choice was made as this population accounts for a disproportionately large amount of fashion sales in the UK but has shorter than average use-cycles, which fits with the appeal of the fashion subscription which offers low commitment and fast change.

An additional screening question was included to gauge the participants' online fashion behaviour: 'How often (on average) do you purchase clothing online? Please only consider purchases of new clothing, but include accessories and footwear.' Responses were measured from 'more than once a week' (1), 'about once a week' (2), 'several times a month' (3), 'about once a month' (4), 'once in a few months or longer' (5), 'never' (6) with a final non-response option. Only the first four responses allowed access to participation in the study to ensure that participants have a general propensity and ability to buy clothing items online, removing potentially confounding effects such as access to online payment methods and lack of knowledge about online retail ordering processes.

Participants were recruited using *Prolific*, which is a crowd-working platform similar to *Amazon MTurk*, but designed specifically for academic research purposes. All participants were compensated for their time according to an estimation of the duration of their participation (He et al., 2018; Koepsell, 2017).

The sample size for this study was determined based on the necessity of testing for invariance as the administration of the product information treatments could cause measurement across cohorts to be distorted. For example, it may be that the measurement of the PCBV construct is not the same in cohort A and B as the cost product information influences how participants view the related items. In this case, hypotheses relating to determinants of purchase intention would have to be tested separately for these two cohorts as the underlying measurement model is not the same. To allow for invariance testing of the cohorts, each cohort was targetted to have at least 250 responses as this is a commonly accepted minimum sample size for SEM (Byrne, 2016). To allow for pairwise testing of the cohorts, this meant a minimum of 500 responses according to the full-factorial experimental design. Ultimately 524 responses were gathered, which were split evenly across the experimental groups as shown in Table 1.

Table 1: Experimental groups and product information given.

<Insert Table 1 here>

These 16 experimental groups could then be clustered into eight experimental cohorts, which allowed for pairwise comparisons as shown in Table 2.

Table 2: Experimental cohorts and product information given.

<Insert Table 2 here>

Lastly, measurement and structural invariance were tested as the presence or absence of product information treatments could distort the measurement model or the interpretation of the structural model.

Study measures

The perceived value, perceived risk, and purchase intention constructs were measured using existing measures or by adapting previously used measures by using seven-point Likert scales (Appendix A).

Demographic measures included age in 4-year intervals, highest level of education achieved, and household income in increasing intervals. Each demographic item included a no-response option.

Podsakoff et al.'s (2003) and MacKenzie and Podsakoff's (2012) advice on ex ante prevention of common method bias (CMB) was implemented by randomising the order of items and constructs shown in the questionnaire. A dummy item was included, which asked participants to select a specific response and cases with incorrect responses were removed from the dataset.

Data collection

The study was hosted online using Qualtrics online survey software. After applying the screening criteria, an initial question asked which company respondents most frequently purchase clothing from online (Appendix C) as this was assumed to be a highly trusted company. The response was fed through the remainder of the study. This control was implemented to account for the effects of product assortment match and price with respondent preferences to ensure that respondents evaluted perceived value and risk associated with the fashion subcription rather than the brand itself. Without this control, a variety of confounding variables would have impacted on the dependent variable which are not focus of this study. To confirm the efficacy of this approach, the level of trust that the respondent has in this company was gauged using a single item (Appendix A) after using Gefen's (2002) trust in e-commerce companies scale as a primer. The response was used to divide

respondents evenly across the experimental groups (compare Table 1) after the description of the hypothetical fashion subscription (Appendix B, Figure 2).

This subscription was explained to participants via text and visualisation to aid in understanding. Following Reim et al. (2015), the amount of ambiguity in the text was limited by outlining responsibilities and penalties.

Next, considering the trust control, participants were randomly allocated to one of the 16 experimental groups, with each group following a different survey flow in the questionnaire. Each of the 16 experimental groups was provided with a separate version of product information (Appendix B), which consisted of short 'claims' made by the company offering the fashion subscription. For the experimental group 1, which was due not to receive additional product information, no further information was provided.

Having read the product information, all participants evaluated the fashion subscription using the same study measures, with demographic items being asked last.

Throughout the experiment it was stressed that the experiment was anonymous, that no personally identifiable information would be collected, and that the authors were interested in the genuine thoughts of the participants, to avoid social desirability bias.

Data collection was completed within three working days; as such no non-response bias tests were conducted.

Pre-testing

The survey instrument was pre-tested twice. Firstly, the study was pre-tested by a group of servitisation and supply chain researchers to advise on the flow of the survey instrument and the experimental design, as well as the phrasing of the fashion subscription and the product information treatments. Minor adjustments to the product information treatments were made subsequently and a visualisation of the fashion subscription was added to improve understanding.

Secondly, 196 study participants were sampled following the same criteria as described for the primary sample considering de Winter's (2009) advice on required sample sizes for reliable factor recovery. The purpose of this pre-test was not to test the structural relationships, but assess whether the assumed factors would be reliably recovered. Reliability, as assessed through Cronbach's alpha scores, was satisfactory (Table 7 in Appendix C). An exploratory factor analysis (EFA) was conducted using Principal Axis Factoring (PAF). A Promax rotation revealed satisfactory convergent and discriminant validity as items loaded onto their respective constructs and cross-loadings remained below 0.25 (Table 8 in Appendix C). No changes were made to the survey instrument after this second pre-test. The responses gathered for the purpose of the second pre-test were subsequently discarded.

Results

Normality data distribution requirements for SEM were assessed initially in SPSS Version 24; maximum absolute values of skewness were less than two and maximum absolute values of kurtosis less than five, satisfying Dubey et al.'s (2015) criteria. Variance inflation factors (VIFs) were calculated to assess multi-collinearity. All VIFs were less than 1.974, which is well below the threshold of five (Bowerman & O'Connell, 1990), indicating the absence of multi-collinearity. The trust control variable displayed a mean of 6.02 on a seven-point Likert scale. This confirms the PSS was rejected by respondents due to an unfamiliar or untrustworthy provider brand.

For the analysis, Anderson and Gerbing's (1988) two-step approach to SEM was applied in AMOS Version 24, following Byrne's (2016) and Hu and Bentler's (1999) recommendations on model fit. As such, first the measurement model was analysed through a confirmatory factor analysis (CFA). This included testing for CMB as well as measurement and structural invariance to assess whether the hypotheses could be reliably tested given the assumed measurement of the constructs and the collected data. Afterwards the structural model was analysed to test the hypotheses related to perceived value and risk factors. Lastly a series of independent sample t-

tests were used to test the hypotheses related to the effects of the product information treatments using imputed factor scores.

Measurement Model Testing

Goodness-of-fit of the measurement model was assessed through a CFA using thresholds recommended by Byrne (2016) and Hu and Bentler (1999). Observed indices fell within recommended thresholds.

Cronbach's alpha scores were consistently above 0.8, satisfying the internal reliability of the employed measures (Table 3). Convergent reliability was tested using factor loadings which should exceed 0.5, composite reliabilities which should exceed 0.8, and average variance extracted (AVE) which should exceed the maximum shared variance (MSV) (Fornell & Larcker, 1981). Table 3 shows that these conditions are met, satisfying convergent validity.

Table 3: Reliability and convergent validity scores.

<Insert Table 3 here>

Discriminant validity was tested by comparing correlations between items of any two construct combinations with the square root of the average shared variance by the items of a single construct (Fornell & Larcker, 1981). Table 4 shows that the square root of the average variance shared between each construct and its items exceeds the correlations, satisfying discriminant validity assumptions.

Table 4: Square roots of AVE of single constructs and its items (diagonals) and correlations between items of two constructs (off-diagonals).

<Insert Table 4 here>

CMB was tested using Harman's single factor test following Podsakoff et al. (2003). The unrotated factor solution showed that a single factor accounted for 33.92% of the variance in the data, which is below the recommended threshold of 50% in the case of relatively high Cronbach's alpha scores (Fuller et al., 2015). It can be assumed that CMB did not significantly influence the results.

Lastly, measurement and structural invariance were tested and Byrne's (2016) criteria were applied to detect significant differences between unconstrained, measurement, and structural models for each of the experimental cohorts. RMSEA and CFI values of the measurement and structural models did not change significantly from the unconstrained models (compare Table 9 in Appendix D). More stringent chi-square difference tests were not significant, except for the structural model of the cohorts related to the environmental product information, cohorts C and D (compare Appendix B). A closer inspection of individual paths and chi-square difference tests, however, confirmed that no significant difference between the structural and unconstrained models exists. As such measurement and structural invariance could be confirmed and responses belonging to all experimental cohorts analysed together in the structural model.

Testing Perceived Value and Risk Hypotheses

Goodness-of-fit of the structural model was measured using Byrne's (2016) and Hu and Bentler's (1999) criteria; model fit remained within recommended thresholds. As such, it was assumed that there is an acceptable fit between the model and data, which then allows for hypothesis testing (Table 5).

Table 5: Structural model goodness-of-fit indices.

<Insert Table 5 here>

Standardised path coefficients (Beta) and coefficient of determination (R-squared) were calculated. As seen in Table 6, purchase intention is strongly determined by the PCBV construct (Beta = 0.567, p-value < 0.001), confirming that Hypotheses 1 is accepted while Hypotheses 2 and 3 are rejected since no other perceived value constructs are statistically significant determinants of purchase intention. For the perceived risk constructs, the PPCR construct reduces the purchase intention (Beta = -0.083, p-value = 0.028), which confirms Hypothesis 4. Hypothesis 5 is rejected as the PSPR construct does not meet the p-value of <0.05, but Hypothesis 6 is confirmed as the PSOR construct does reduce purchase intention significantly (Beta = -0.093, p-value = 0.015). As the PRSR construct does not feature a significant p-value, Hypothesis 7 is rejected. Lastly, Hypothesis 8 is confirmed as the PRLR construct reduces purchase intention significantly (Beta = -0.202, p-value < 0.001). Neither the demographic variables in age, income or education, nor the trust control variable show significant effects on purchase intention. Overall, the model explains 60% of variance in purchase intention among the sample (R-squared = 0.60).

Table 6: Determinants of purchase intention (R-squared = 0.60).

<Insert Table 6>

Testing Product Information Hypotheses

Independent samples' t-tests were conducted to assess the effects of product information on their respective constructs using imputed composite factor scores. Outliers and normal data distribution requirements for independent samples' t-tests were assessed. The highest number of outliers detected using boxplots per independent sample was ten; it was concluded that this is acceptable, especially given measurement on a seven-point Likert scale. Data tended to be slightly left-skewed and leptokurtic but t-tests are robust to deviations from normality, especially with high sample sizes (Fields, 2013).

To assess the effect of the cost product information, cohorts A and B were compared. For the cost product information, the t-test indicated that PCBV scores for the

sample lacking this information were marginally lower (M = 3.81, SD = 1.54) than for those who had received this knowledge (M = 3.97, SD = 1.56). This effect was, however, not statistically attributable to the information treatment, t(522) = -1.186, p-value = 0.236, refuting Hypothesis 9.

Hypothesis 10 was confirmed, as cohort D having received the environmental product information had a significantly higher score for PEBV (M = 5.16, SD = 1.10) than cohort C lacking that product information (M = 4.72, SD = 1.38), t(496) = -4.00, p-value < 0.001, Cohen's d = 0.36. Levene's test indicated unequal variances (F = 12.97, p-value < 0.001), so degrees of freedom were adjusted from 522 to 496.

Similarly, Hypothesis 11 was confirmed, as the physical condition product information was able to lower the perceived risk: physical condition construct in the treatment sample cohort F (M = 4.47, SD = 1.51) as opposed to the no-treatment sample cohort E (M = 4.86, SD = 1.52), t(522) = 2.96, p-value = 0.03, Cohen's d = 0.26.

The style preference product information lowered the PSPR slightly for the sample having received the information cohort H compared with the sample with no additional product information cohort G (M = 4.74, SD = 1.31; M = 4.96, SD = 1.30), t(522) = 1.97, p-value = 0.049, Cohen's d = 0.17. This confirmed Hypothesis 12, despite the effect size being small (Fields, 2013).

Lastly, it was considered possible that the additional product information could also influence purchase intention directly instead of or in addition to working through the hypothesised constructs despite the literature not supporting such relationships. Such relationships, if significant, would imply that there are aspects of the model that are not hypothesised about and cannot be explained using the proposed literature. These relationships between the product information treatments and purchase intention were tested for via t-tests; none of the product information treatments showed a significant direct effect on purchase intention.

Discussion and Implications

The results of this research have several interesting implications.

Initially, it can be established that Prospect Theory is well suited as a theoretical backdrop to structure and predict consumer adoption of PSS containing significant sources of risk. This is in line with previous applications of this theoretical framework in product cases that are perceived to be risky or innovative (Wang & Hazen, 2016). As such, it is argued that Prospect Theory can complement the use of Practice Theory and Consumer Culture Theory that have been used previously to probe into what may motivate or prevent continued use of PSS after initial adoption (Catulli et al., 2017; Mylan, 2015).

Empirically, the results show that there are three areas that are critical for consumer adoption of radical PSS, such as the one described. These areas relate to cost savings, the downside of convenience, and newness and re-use, which are discussed in the following.

The Importance of Cost Savings

Overall, the pure monetary perspective appears paramount. This is reflected both in the importance of the opportunity to save money by choosing a PSS over a conventional alternative as proposed in the confirmed H1, as well as the fear that these savings will not be realised as one is being held liable for damaged or late product returns, shown in H8. This extends the findings by Cherry and Pidgeon (2018) by proving that this is the most impactful perceived risk after all. This point becomes especially important as any money spent on penalties diminishes previously anticipated savings, which matches the suspicion that PSS providers may try to ‘claw back’ revenue later (Rexfelt & Hiort af Ornäs, 2009).

The overarching significance of this area becomes more important as the two other potential advantages PSS, access to more product variety and environmental gains, are not perceived to be impactful as shown in the rejected H2 and H3. This confirms the notion that, despite numerous cited advantages of PSS presented in literature, the sacrifices a consumer is expected to make will have to be balanced by a strong appeal to value-for-money perceptions (Poppelaars et al., 2018; Retamal, 2017). This corroborates the more cautious voices indicating that cost is the main driver of PSS adoption (Tukker, 2015).

The Downside of Additional Convenience

Another potential advantage in the added convenience stemming from the access-service provided by use- and result-oriented PSS can actually detract from the attractiveness of the PSS as it prevents activities that contribute to consumer satisfaction, summarised in H6. The negative impact on the experiential aspect of shopping that ties in with emotional needs for socialising, rewarding oneself, or symbolising renewal and change (Armstrong et al., 2015) validates the Activity Theory perspective proposed by Rexfelt and Hiort af Ornäs (2009). This shows that what constitutes a burden or an enjoyable activity depends on the exact product and targeted consumer group. More work is needed here to design new enjoyable activities to replace others that become obsolete through PSS consumption. An example from this research could be to foster shared rituals among users of the fashion subscription by motivating users to post about and discuss the received fashion products on social media, highlighting the surprise aspect of the offer. Research indicates that such brand communities would have benefits for the provider in turn (Laroche et al., 2012).

Issue of Newness and Re-use

It also appears that issues around newness and re-use, in the case reflected in the physical condition of clothing, encapsulated in H4, continue to worry consumers (Armstrong et al., 2015; Catulli & Reed, 2017). This result confirms earlier assertions, but is made more remarkable given that the PSS provider in this case commands a relatively high level of trust from respondents. This indicates that trustworthy brands with the resources and customer relationships to begin offering PSS are not able to transfer this trust acquired in the selling of clothes to reliably providing used clothing in an ‘as new’ condition.

Two further points that this study can also shed light on are the lack of choice and the emotional aspect of ownership, which are reflected in the associated rejected hypotheses H5 and H7.

The fact that products are chosen by the provider does not appear to be a significant perceived risk for potential adopters of PSS. It might be that in this case the provider is able to transfer trust built with consumers successfully. Findings suggest that consumers are aware of thee provider's skills in providing a product assortment that matches the preferences of the consumer through knowledge of the brand and previous interactions. This is a highly relevant finding because clothing as a product category is more dependent on individual preferences than car-sharing PSS in which the transportation utility is at the forefront of consumer minds (Chian Tan et al., 2017). This indicates that environmentally ambitious result-oriented PSS in fashion might therefore not be as far away from mainstream viability as previously assumed (Armstrong et al., 2015).

Ownership remains a contentious issue, while it may be argued that consumers form emotional attachments to items, especially when they become embedded in activities and routines, or associated with pleasurable memories. Larger consumer culture drifts, such as the fast fashion paradigm, have eroded such bonds due to the speed and scale of clothing acquisition and disposal (Armstrong et al., 2015). Interestingly, it therefore appears that an environmentally disastrous consumption paradigm has fostered habits in consumers that enable a move towards more sustainable options, such as the PSS analysed in this paper. Nevertheless a lack of ownership also brings financial responsibility for the PSS product-component. Reducing perceived risk by providing lenient returns policies will be critical to give assurances to consumers to allow PSS to penetrate markets initially. This could create both financial and environmental costs as products may be handled less carefully and need to be replaced more frequently (Petersen & Riisberg, 2017).

The Effects of Product Information on Perceived Values and Risks

Regarding the effect of product information, the findings are divided.

Overall, it appears that PSS providers can foster favourable perceptions of PSS by addressing sources of perceived value and risk through additional product information as H10, H11 and H12 were confirmed. This reduces the degree of uncertainty presented by such offers even if not all sources of uncertainty are

significant for determining purchase intentions, which corroborates authors stressing the importance of information (Överholm, 2017; Poppelaars et al., 2018). However, even when a brand is highly trusted, providers should not expect their assurances to hold much value for the consumer. This has been overlooked in past studies (Armstrong et al., 2015; Rexfelt & Hiort af Ornäs, 2009). This strengthens the argument for providing independent information, for example certifications (Catulli & Reed, 2017). Consumers might be aware that the skills and resources required to run traditional business models to their satisfaction differ from those required for successful PSS offers, which is reflected in the difficult journeys of some providers in practice (Chian Tan et al., 2017). Some perceived risks may only be fully mitigated through positive experiences, as the findings of this study indicate that the physical condition of used clothing items remains a source of worry that significantly lowers purchase intentions even for consumers privy to additional product information by a trusted brand. Meanwhile, environmental information (H10) or information on the uncertain nature of such PSS (H11 and H12) improves perceptions but according to this study a provider should not focus on these aspects when framing PSS offers since they are not at the forefront of consumer thinking.

It appears that the most important driver for PSS adoption, cost saving potential, cannot be reliably communicated through product information as H9 was refuted. There are two opposing explanations that should be explored further in future research. On the one hand it may be that consumers are aware of rebound effects. Even though value-for-money increases for the consumer, the total expenditure may remain the same as consumption levels are increased, resulting in 'hyperconsumption' (Retamal, 2017). In this case, any environmental gains from the PSS are likely to be offset by increased consumption levels, which is also a threat common to other PSS (Cherry & Pidgeon, 2018; Mont et al., 2006). On the other hand it may be that consumers automatically assume that the lack of choice and ownership are significant sacrifices that need to be balanced with lower costs to warrant consideration in the first place (Tukker, 2015). This implies that PSS providers should indeed promote price as a main selling point. Nevertheless, focus should also be placed on other positives to avoid manoeuvring their offer into a discount corner of the respective market, even when knowing that cost savings are the main pull. Following this logic, framing PSS as environmentally or socially

friendly, or tapping into attitudes about smart consumerism (Cherubini et al., 2015), well-being (Santamaria et al., 2106) may be the right approach after all, although Park and Armstrong's (2019) warn that positioning such offers outside of the mainstream may heighten feelings of risk among more consumers.

Conclusion and Future Research

PSS have been framed in the recently reinvigorated sustainability debate on the circular and sharing economy as having potential in aligning producer and consumer interests while reducing material consumption and emissions. In this paper, a fashion subscription featuring use- and result-oriented PSS characteristics responsible for improved environmental performance has been quantitatively analysed. This analysis focused on a PSS that is offered by an established, trusted brand, and this study's insight is most relevant for companies seeking to diversify their revenue by offering subscription services in addition to their current sales. The high trust capital commanded by the provider in this case meant that consumer responses were likely more positive than for an unknown provider.

As such it appears that the hybrid sustainable PSS featured in this study is not seen as negatively by consumers as may be expected if the PSS were offered by a fictious brand, and that some of the most prominently discussed barriers do not impact on its adoption. Whereas a large variety of factors are considered during adoption, only a handful appear to bear on the decision to adopt a PSS that differs significantly from the traditional consumption paradigm based on newness, ownership, and choice. Overall it seems that PSS adoption by consumers can be predicted by monetary matters to a higher degree than may be expected, based on previous qualitative studies, although questions regarding the condition of used items as well as activities associated with the traditional consumption paradigm remain relevant. Aside from lower costs, no drivers of PSS adoption were found, but also a number of potential barriers do not appear to be relevant. Beyond the risk of an ongoing relationship including some degree of uncertainty, a lack of ownership or choice do not seem to be barriers in the analysed case of a fashion PSS and young female consumers. While this may be partially explained by the commoditisation of

fashion, it also provides further evidence for a larger shift in consumer culture conducive to the sharing and circular economy (Ellen MacArthur Foundation, 2014).

Framing a PSS in the right way and providing the right type of information to reassure consumers concerning perceived values and perceived risks will be critical in putting PSS adoption into practice. Here Prospect Theory can be drawn on as a theoretical backdrop to alter reference points and design favourable frames.

In practice, established brands, which are best suited to provide PSS in mass markets such as fashion, will struggle to tap into existing trust capital with consumers. This finding gives a more nuanced understanding of the importance of trust for PSS adoption. Marketing PSS primarily as providing cost saving opportunities would appear to be a strategic mistake, even if consumers are most attracted by obtaining more value for money, as this could push the offer into a discount niche in which existing negative attitudes and stigmata to 'not new' become increasingly powerful.

This study includes several limitations, which also provide angles for future research. Firstly, this study has focused on a PSS case that is tied to a particular product category in fashion, which has partially determined the factors hypothesised to predict purchase intention. It can be expected that the factors found to be relevant in this case would be different for other products. It would be especially interesting to assess whether the paramount importance of cost saving opportunities also holds true for product categories that are less commodified.

Secondly, in this study the sampling strategy has focused on who can be assumed to be the most likely consumer based on a high volume of fashion purchases and who, if motivated to change from traditional fashion consumption to a more sustainable PSS, could produce the largest environmental gains. This, however, also means that it remains unknown how more nuanced consumer characteristics such as personal values spur PSS adoption intentions (Piscicelli et al., 2015). Studies assessing how risk-taking propensity, trusting attitudes, or particular use-regimes influence the relationships analysed in this research would provide further insight into how PSS should be geared towards certain consumers. It is imaginable that the relevant consumer groups of sustainable PSS are not united by their shared use-regimes, but by their willingness to take risks and change existing habits.

Thirdly, in this study it has been attempted to control for the trust in the provider under the assumption that a consumer would not adopt a PSS such as the one described here from an untrustworthy source given the risk involved. However, it may not always be possible for a brand with existing trust capital with consumers to introduce a PSS – many free-floating car-sharing providers cannot draw on brand trust with consumers to mitigate existing concerns due to their newness. An initial angle for additional research therefore would be to assess consumer adoption of a PSS offered by provider commanding less trust, which could shed more light on the relative importance of trust. Going further, according to previous research in marketing, trust is not a one-dimensional construct but spread across several dimensions (Gefen, 2002). Assessing which of these dimensions are pivotal for PSS adoptionn could advance the field significantly.

Fourthly, this study has looked at consumer adoption, not consumer acceptance. It can be assumed that once a consumer has begun using a PSS, reasons for continued use shift from those relevant at the point of initial purchase and adoption (Mylan, 2015; Rexfelt & Hiort af Ornäs, 2009). Taking the future perspective, more research is needed into this discrepancy in order to establish PSS as continuously competitive options to the take-make-use-dispose economy. In this endeavour the academic community would benefit from more research with consumers who have made this transition, which remains difficult as PSS cases such as the one researched here remain sparse. In this vein it should also be noted that this study sought to predict adoption intentions, and that intentions do not always result in actual behaviour (Boulstridge & Carrigan, 2000), which is also tied to the difference between adoption and acceptance in the case of B2C PSS.

Lastly, the insights of this study may be subject to the attitude-behaviour gap and value-action gap. Previous studies have shown that positive attitudes or values towards issues such as environmental sustainability do not necessarily translate into corresponding purchases in practice (de Pelsmacker, 2005; Young et al., 2010). While this particular product characteristic was not statistically impactful for the examined PSS, it is still likely that actual reasons for purchase would differ to some extent from the predictions made in this study. As such, future research could

explore further how existing attitudes and values interact with PSS evaluations and the more mechanistic relationships generated through Prospect Theory approaches.

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Tables

Table 1: Experimental groups and product information given.

Experimental group	Cost product information	Environmental product information	Style-preference product information	Physical condition product information	N per group
Group 1	Not given	Not given	Not given	Not given	32
Group 2	Given	Not given	Not given	Not given	32
Group 3	Not given	Given	Not given	Not given	33
Group 4	Not given	Not given	Given	Not given	33
Group 5	Not given	Not given	Not given	Given	33
Group 6	Given	Given	Not given	Not given	33
Group 7	Given	Not given	Given	Not given	33
Group 8	Given	Not given	Not given	Given	32
Group 9	Not given	Given	Given	Not given	33
Group 10	Not given	Given	Not given	Given	33
Group 11	Not given	Not given	Given	Given	33
Group 12	Not given	Given	Given	Given	33
Group 13	Given	Not given	Given	Given	33
Group 14	Given	Given	Not given	Given	33
Group 15	Given	Given	Given	Not given	33
Group 16	Given	Given	Given	Given	32

Table 2: Experimental cohorts and product information given.

	Cohort characterstic	Experimental groups included	N per cohort
Cohort A	Cost product information not given	1, 3, 4, 5, 9, 10, 11, 12,	261
Cohort B	Cost product information given	2, 6, 7, 8, 13, 14, 15, 16	263
Cohort C	Environmental product information not given	1, 2, 4, 5, 7, 8, 11, 13	263
Cohort D	Environmental product information given	3, 6, 9, 10, 12, 14, 15, 16	261
Cohort E	Style preference product information not given	1, 2, 3, 5, 6, 8, 10, 14	263
Cohort F	Style preference product information given	4, 7, 9, 11, 12, 13, 15, 16	261
Cohort G	Physical condition product information not given	1, 2, 3, 4, 6, 7, 9, 15	262
Cohort H	Physical condition product information given	5, 8, 10, 11, 12, 13, 14, 16	262

Table 3: Reliability and convergent validity scores.

Constructs	Cronbach's alpha	Factor loading	Composite reliability	Average variance extracted (AVE)	Maximum shared variance (MSV)
PCBV	0.909	0.85 – 0.94	0.939	**0.795**	0.486
PVBV	0.943	0.75 - 0.93	0.913	**0.726**	0.228
PEBV	0.963	0.88 – 0.92	0.945	**0.812**	0.230
PPCR	0.947	0.85 – 0.94	0.951	**0.828**	0.251
PSPR	0.934	0.81 – 0.94	0.928	**0.764**	0.251
PSOR	0.927	0.80 – 0.91	0.928	**0.764**	0.265
PRSR	0.926	0.82 – 0.94	0.935	**0.783**	0.268
PRLR	0.950	0.86 – 0.93	0.948	**0.819**	0.268
PI	0.945	0.91 – 0.97	0.963	**0.897**	0.486

Table 4: Square roots of AVE of single constructs and its items (diagonals) and correlations between items of two constructs (off-diagonals).

	PVBV	PCBV	PI	PRLR	PRSR	PSOR	PSPR	PPCR	PEBV
PVBV	**0.852**								
PCBV	0.486	**0.899**							
PI	0.392	0.704	**0.947**						
PRLR	-0.166	-0.332	-0.484	**0.905**					
PRSR	-0.164	-0.216	-0.311	0.518	**0.885**				
PSOR	-0.251	-0.122	-0.271	0.330	0.515	**0.874**			
PSPR	-0.192	-0.387	-0.453	0.467	0.379	0.296	**0.874**		
PPCR	-0.203	-0.203	-0.348	0.427	0.371	0.320	0.501	**0.910**	
PEBV	0.355	0.491	0.360	-0.149	-0.084	-0.154	-0.173	-0.132	**0.901**

Table 5: Structural model goodness-of-fit indices.

GOFs	Observed indices
Chi-square	1309.848, p = 0.000
DF	666
Chi-square/DF	1.967
AGFI	0.868
NFI	0.933
CFI	0.966
TLI	0.962
IFI	0.966
RMSEA	0.043

Table 6: Determinants of purchase intention (R-squared = 0.60).

Hypothesis	Construct/ item	Standardised Beta	P-value
H1 (supported)	Perceived cost benefit value	0.567	<0.001
H2 (unsupported)	Perceived variety benefit value	0.034	0.361
H3 (unsupported)	Perceived environmental benefit value	0.006	0.868
H4 (supported)	Perceived physical condition risk	-0.083	0.028
H5 (unsupported)	Perceived style preference risk	-0.070	0.082
H6 (supported)	Perceived shopping opportunities risk	-0.093	0.015
H7 (unsupported)	Perceived return sacrifice risk	0.021	0.615
H8 (supported)	Perceived return liability risk	-0.202	<0.001
H13 (unsupported)	Trust	0.004	0.892

Appendix A: Measures

Perceived cost benefit value adapted from Sweeney and Soutar (2001) (1st – 2nd items), Wang and Hazen (2016) (3rd item), and Kim et al (2008) (4th item). Measured using seven-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (7).

ValCos_1: Compared to buying new clothes, using [Company]'s fashion subscription would be economical for me.

ValCos_2: In comparison to buying new clothes, the fashion subscription by [Company] would offer me better value for money.

ValCos_3: Using [Company]'s fashion subscription would lower my fashion expenses compared to buying new clothes.

ValCos_4: Compared with buying new clothes, [Company]'s fashion subscription offers me opportunities to save money.

Perceived variety benefit value adapted from Sweeney and Soutar (2001). Measured using seven-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (7).

ValVar_1: In comparison to buying new clothes myself, [Company]'s fashion subscription would give me access to a greater variety of clothing.

ValVar_2: Using [Company]'s fashion subscription would allow me to change what I wear more often than if I would buy new clothes.

ValVar_3: The clothing variety provided to me by [Company]'s fashion subscription would be higher than if I would buy new clothes myself.

ValVar_4: [Company]'s fashion subscription would allow me to wear different clothes more often than if I bought new clothes.

Perceived environmental benefit value adapted from Wang et al. (2013) (1st – 2nd items) and Chen and Chang (2013) (3rd – 4th items). Measured using seven-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (7).

ValEnv_1: In comparison to buying new clothes, using [Company]'s fashion subscription would lead to natural resource and energy savings.

ValEnv_2: Using [Company]'s fashion subscription would reduce harmful effects to the environment in comparison to buying new clothes.

ValEnv_3: Using [Company]'s fashion subscription would have a better environmental performance than buying new clothes.

ValEnv_4: Compared with buying new clothes, using [Company]'s fashion subscription would reduce overall natural resource and energy consumption.

Perceived physical condition risk adapted from Featherman and Pavlou (2003). Measured using seven-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (7).

RisCon_1: I am afraid that the clothing items received through [Company]'s fashion subscription would be damaged or dirty.

RisCon_2: I worry that the clothing items delivered to me by [Company] as part of a fashion subscription would be in poor condition.

RisCon_3: I am afraid that the physical condition of the clothing items received through [Company]'s fashion subscription would not meet my expectations.

RisCon_4: I am worried that the clothing items delivered to me as part of [Company]'s subscription would be damaged or unhygienic.

Perceived style preference risk adapted from Featherman and Pavlou (2003). Measured using seven-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (7).

RisPre_1: I am afraid that the clothing items received through [Company]'s fashion subscription would not meet my fashion style.

RisPre_2: I am worried that the size and style of the clothing items delivered to me as part of [Company]'s fashion subscription would not meet my preferences.

RisPre_3: I worry that [Company] would deliver clothing items that do not look good on me if I used their fashion subscription.

RisPre_4: I am afraid that the clothing items delivered to me as part of [Company]'s fashion subscription would not fit me or my personal style.

Perceived shopping opportunities risk adapted from Featherman and Pavlou (2003). Measured using seven-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (7).

RisSO_1: I worry that if I use [Company]'s fashion subscription I would regret having less occasions to shop for new clothes.

RisSO_2: I am afraid that I would miss the joy of hunting for new clothes if I use [Company]'s fashion subscription.

RisSO_3: I am worried that having less reasons to go shopping for new clothes would feel like a loss to me if I used [Company]'s fashion subscription.

RisSO_4: I am afraid that I would miss the fun of shopping for new clothes if I used [Company]'s fashion subscription.

Perceived return sacrifice risk adapted from Featherman and Pavlou (2003). Measured using seven-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (7).

RisRS_1: I am afraid that sending the received clothing items back would feel like a loss to me if I use [Company]'s fashion subscription.

RisRS_2: I worry that returning the received clothing items would make me feel unhappy if I use [Company]'s fashion subscription.

RisRS_3: I am afraid that returning the clothing items received by [Company] as part of a fashion subscription would make me feel regret.

RisRS_4: I am worried that it would make me feel sad returning the clothing items received by [Company] as part of a fashion subscription.

Perceived return liability risk adapted from Featherman and Pavlou (2003). Measured using seven-point Likert scale from 'strongly disagree' (1) to 'strongly agree' (7).

RisRL_1: I worry that the monthly return policy of [Company] would cause me problems when using their fashion subscription.

RisRL_2: The monthly return policy of [Company] would be a source of worry for me when using their fashion subscription.

RisRL_3: I am afraid that [Company]'s monthly return policy would make me feel anxious when using their fashion subscription.

RisRL_4: I am afraid that the monthly return policy would feel like a risk for me when using [Company]'s fashion subscription.

Purchase intention adapted from Burton et al. (1999). Measured using seven-point Likert scale with different scale endpoints for each of the three items, but only numbering the ones in between: ‘less likely’ (1) to ‘more likely’ (7), ‘not probably’ (1) to ‘very probable’ (7), and ‘very unlikely’ (1) to ‘very likely’ (7).

PI_1: Would you be more likely or less likely to purchase a fashion subscription by [Company], given the information shown?

PI_2: Given the information shown, how probable is it that you would purchase a fashion subscription by [Company]?

PI_3: How likely would you be to purchase a fashion subscription by [Company], given the information shown?

Trust adapted from Chaudhuri and Holbrook (2001). Measured using seven-point Likert scale from ‘strongly disagree’ (1) to ‘strongly agree’ (7).

T_1: I trust this brand.

Appendix B: Fashion subscription

Prompt to elicit most frequented online fashion retailer:

Please name the brand from which you most frequently buy clothing items online. This may be a fashion brand selling their own products via an online store, or an online platform selling clothing from a variety of brands.

Please name only one brand.

Fashion subscription description:

Imagine that in the near future [Company] offers a new fashion subscription to you.

When signing up to this subscription in [Company]'s online shop, you initially choose what type of clothing item, size, and price range you want to have a subscription for. You can add as many items to your subscription as you want; for example, you could choose to make a subscription for one (or several) full outfits and/or some individual items to complement your existing wardrobe. The price of the subscription will be a proportion of the retail price of the clothing items you make a subscription for.

[Company] will then deliver a box of such items to you every month for you to wear, but at the end of each month you have to send the items back in the same box free of charge. Should you not return the items in time and in normal, used condition, you will be charged the full new retail price of each item, plus a significant administrative fee as per [Company]'s monthly return policy for the subscription.

You do not know what the exact items are prior to receiving them as the items are picked by [Company] every month when preparing your new box.

Also, the items delivered to you by [Company] have been worn by other people as [Company] continuously cycles the items among other users of the fashion subscription.

This subscription recurs monthly, but can be changed or terminated towards the end of each month.

<insert Figure 2 here>

Figure 2: Visualisation of fashion subscription.

Cost-related product information (CosI):

[Company] claims that using the fashion subscription can reduce your overall fashion spending significantly in comparison to buying new clothes as you usually do. This is because [Company] can offer you the fashion items at a small fraction of their retail price as they earn consistent revenue by cycling the items among the fashion subscribers.

Environmental-related product information (EnvI):

[Company] claims that this fashion subscription provides significant benefits for the environment compared with buying new clothes as you usually do. This is because the re-use of fashion items lowers fashion waste, which reduces pollution and the consumption of raw materials and energy – even when packaging and posting of the monthly boxes is taken into account.

Physical condition-related product information (PhyI):

[Company] claims that even though the fashion items delivered to you as part of their subscription are pre-used, all items are promised to be in 'as new' condition. This is because each item is professionally checked and sanitised before being delivered to you by [Company] as part of a monthly box.

Style preference-related product information (StyI):

[Company] claims that their fashion subscription is able to reliably provide you with items that will match your fashion preferences. This is because you can submit very detailed preferences in terms of your own style, your body type, and size when configuring your subscription.

Appendix C – Pre-test of measures

Table 7: Cronbach's alpha values of constructs in the pre-test.

Construct	Number of variables	Cronbach's alpha
Perceived cost benefit value	4	0.937
Perceived variety value	4	0.913
Perceived environmental benefit value	4	0.942
Perceived physical condition risk	4	0.946
Perceived style preference risk	4	0.915
Perceived shopping opportunities risk	4	0.916
Perceived return sacrifice risk	4	0.925
Perceived return liability risk	4	0.943
Purchase intention	3	0.955

Table 8: Pattern matrix factor loadings for the pre-test (n=196) using Principal Axis Factoring with a Promax rotation. Loadings below 0.2 are suppressed for better readability.

	1	2	3	4	5	6	7	8	9
ValEnv_3	.949								
ValEnv_2	.936								
ValEnv_4	.852								
ValEnv_1	.847								
RisRL_2		.946							
RisRL_4		.902							
RisRL_1		.877							
RisRL_3		.835							
RisCon_1			.986						
RisCon_2			.935						
RisCon_4			.903						
RisCon_3			.759						
ValVar_4				.937					
ValVar_2				.903					
ValVar_3				.799					
ValVar_1				.765					
RisPre_4					.938				
RisPre_3					.894				
RisPre_2					.799				
RisPre_1					.782				
ValCos_3						.954			
ValCos_4						.879			
ValCos_2						.839			
ValCos_1						.727			
RisRS_2							.931		
RisRS_4							.871		
RisRS_3							.826		
RisRS_1							.814		
RisSO_3								.928	
RisSO_2								.909	
RisSO_4								.878	
RisSO_1							.215	.760	
PI_2									.930
PI_3									.888
PI_1									.853

Appendix D – Invariance testing

Table 9: Group invariance testing including measurement and structural model testing.

Information treatment groups to be compared	Cohort A vs. Cohort B			Cohort C vs. Cohort D			Cohort E vs. Cohort F			Cohort G vs. Cohort H		
Models compared	Uncon st.	Measure. model.	Strct. model	Uncon st.	Measure. model.	Strct. model	Uncon st.	Measure. model.	Strct. model	Uncon st.	Measure. model.	Strct. model
NPAR	212	186	141	212	186	141	212	186	141	212	186	141
Chi-square	1732.482	1762.08	1806.149	1753.737	1779.742	1853.659	1739.236	1764.158	1800.621	1704.289	1727.347	1774.136
DF	1048	1074	1119	1048	1074	1119	1048	1074	1119	1048	1074	1119
ΔChi-square	/	29.598	73.667	/	26.005	99.922	/	24.922	61.385	/	23.058	69.847
ΔDF	/	26	71	/	26	71	/	26	71	/	26	71
Chi-square/DF	1.653	1.641	1.614	1.673	1.657	1.657	1.660	1.643	1.609	1.626	1.608	1.585
Chi-square test p-value	/	0.285	0.391	/	0.463	0.013	/	0.523	0.785	/	0.63	0.516
RMSEA	0.035	0.035	0.034	0.036	0.035	0.035	0.036	0.035	0.034	0.035	0.034	0.033
ΔRMSEA	/	0	-0.001	/	-0.001	-0.001	/	-0.001	-0.002	/	-0.001	-0.002
CFI	0.964	0.964	0.964	0.962	0.962	0.961	0.963	0.964	0.964	0.965	0.966	0.966
ΔCFI	/	0	0	/	0	-0.001	/	0.001	0.001	/	0.001	0.001