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Drivers and Barriers to Product-Service System Consumer Adoption in a Fashion Subscription Case

by

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Doctor of Philosophy in Engineering

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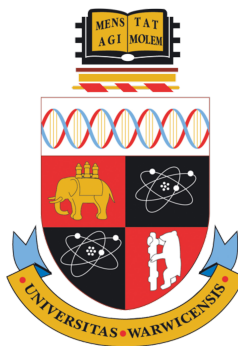


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Declaration

I confirm that this thesis is my own work. The three publications declared under the heading ‘Publications’ have been wholly written by myself, including data collection and analysis. Co-authors of these publications acted in advisory or assisting roles. While insight published in the following two papers informed sections of this thesis, specific material from these papers are not contained in the thesis:

Masi, D., Day, S., & Godsell, J. (2017). Supply chain configurations in the circular economy: A systematic literature review. *Sustainability*, 9(9), 1602.

Day, S., Masi, D., Godsell, J., & Zhang, W. (2018). Researching product service systems for consumers: insights from a systematic literature review. Published in *Proceedings of the 25th Annual EurOMA Conference*, Budapest University of Technology and Economics, Budapest, Hungary, 24-26 June 2018.

I confirm that this thesis has not been submitted for a degree at another university.

Publications

Aspects of this research project have previously been published. In chronological order, the rationale underpinning the introductory chapter was synthesised from:

Masi, D., Day, S., & Godsell, J. (2017). Supply chain configurations in the circular economy: A systematic literature review. *Sustainability*, 9(9), 1602.

Parts of the literature review chapter, in particular Section 2.3 ‘Consumer Adoption of PSS’, has benefitted from:

Day, S., Masi, D., Godsell, J., & Zhang, W. (2018). Researching product service systems for consumers: insights from a systematic literature review. Published in *Proceedings of the 25th Annual EurOMA Conference*, Budapest University of Technology and Economics, Budapest, Hungary, 24-26 June 2018.

Finally, a journal article based on the research of this thesis has been submitted to *Business Strategy and the Environment* by Steven Day, Jan Godsell, Donato Masi and Wanrong Zhang in April 2019. Since May 2019, the article is under the status of ‘major revisions’.

Abstract

Product-service systems (PSS) have been proposed as one mechanism through which corporate, consumer, and environmental interests may be aligned. The drivers for and barriers to consumer adoption, however, have remained largely unknown. This has impeded the diffusion of PSS and delayed the transition to a more sustainable consumption paradigm. The role of trust in the PSS provider, one factor that is assumed to be critical to consumer adoption, remains similarly underexplored.

This study borrows a consumer decision-making model derived from prospect theory as a theoretical lens. This lens is better suited to predicting adoption than explaining acceptance, on which previous theories in PSS research have focused. A PSS from the area of fashion, which features use- and result-oriented PSS attributes, is chosen as the context.

The drivers for and barriers to the adoption of this PSS are quantitatively investigated (n=524) by combining experimental research design with structural equation modelling. Perceived value and risks are hypothesised to predict purchase intention, and product information treatments are presented to study participants to assess whether product information from a trusted provider can reduce uncertainty.

The findings indicate that only cost savings potential will motivate consumers to purchase the PSS. Various perceived risks, including concerns about the product's physical condition, fears that the PSS may render enjoyable shopping activities redundant, and the fear of being held financially liable for product returns, detract from purchase intentions, even if the provider is highly trusted. Four specific product information types are explored and the results indicate that trusted PSS providers have some scope to shift consumer perceptions in favour of adoption. The exception here remains the assurance that consumers can save money by purchasing the PSS instead of alternatives. This, combined with the relatively weak effects of the other product information types, indicates a) that several dimensions of trust are at work and b) that providers will struggle to transfer trust gained in regular business models to the effective marketing of PSS.

This study extends current knowledge by first quantitatively assessing the predictors of adoption in a PSS case combining various sustainability mechanisms under more realistic conditions to determine which are impactful. Second, knowledge from consumer decision-making is transferred to the area of PSS research. Third, the role of trust is specified to greater detail. Several avenues for future research emerge from these contributions.

Keywords: PSS; B2C; consumer adoption; fashion; circular economy; sharing economy.

List of Abbreviations

AFI	Absolute fit index
AGFI	Average goodness-of-fit index
AMOS	Analysis of Moment Structures (Software)
AMT	Amazon Mechanical Turk
AT	Activity theory
AVE	Average variance extracted
B2B	Business-to-business
B2C	Business-to-consumer
BSREC	Biomedical & Scientific Research Ethics Committee
CB	Covariance-based
C2C	Consumer-to-consumer
CB	Covariance-based
CCT	Consumer culture theory
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CMB	Common method bias
CMV	Common method variance
CO ₂	Carbon dioxide
CPT	Cumulative prospect theory
CR	Composite reliability
Dev.	Deviation
DF	Degrees of freedom
EC	European Commission
EFA	Exploratory factor analysis
EMF	Ellen MacArthur Foundation
EPA	Environmental Protection Agency (USA)
EPC	Estimated parameter changes
Est.	Estimate

EU	European Union
GFI	Goodness-of-fit index
H	Hypothesis
IFI	Incremental fit index
IPS2	Industrial product-service system
KMO	Kaiser-Myer-Olkin
MI	Modification index
MSV	Measurement error variance
n	Sample
NFI	Normed fit index
p	Probability
PAF	Principles axis factoring
PE	Parameter estimate
PERVAL	Perceived value scale
PFI	Parsimonious fit indices
PGFI	Parsimonious goodness-of-fit index
PIL	Participant information leaflet
PLS	Partial least squares
PNFI	Parsimonious normed fit index
PT	Practice theory
PSS	Product-service system
RMR	Root mean square residual
RMSEA	Root mean square error of approximation
SE	Standard error
SEM	Structural equation modelling
SERVAL	Perceived service value scale
SPSS	Statistical Package for the Social Science (Software)
SR	Standardised residuals
Std.	Standard
TLI	Tucker-Lewis index
VIF	Variation inflation factor

WFD	Waste Framework Directive (Directive 2008/98/EC)
WEEE	Waste of Electrical and Electronic Equipment (Directive 2012/19/EU)
WRAP	The Waste and Resources Action Programme
WRI	World Resources Institute

We travel together, passengers on a little spaceship, dependent on its vulnerable reserves of air and soil; all committed for our safety to its security and peace; preserved from annihilation only by the care, the work, and, I will say, the love we give our fragile craft. We cannot maintain it half fortunate, half miserable, half confident, half despairing, half slave—to the ancient enemies of man—half free in a liberation of resources undreamed of until this day. No craft, no crew can travel safely with such vast contradictions. On their resolution depends the survival of us all.

Adlai Stevenson on the 7th of July 1965, addressing the United Nations in Geneva, Switzerland.

1. Introduction

1. Introduction

1.1 Chapter Introduction

Following this introductory section, this chapter is divided into three sections:

Section 1.2, ‘Real World Background’, outlines the problem setting introduced in Section 1.2.1, ‘Current Fashion Production and Consumption Systems’ by identifying the inefficiencies in the global fashion industry that have resulted in a sprawling and overall unsustainable system. Afterwards, several potential solutions are presented and critiqued in Section 1.2.1, ‘Towards More Sustainable Fashion Consumption’. This thesis approaches the problem from the perspective of emerging innovative business models that are poised to compete with the take-make-use-dispose model of production and consumption. Section 1.3, ‘Thesis Objectives’, initially explains, in Section 1.3.1, ‘New Economies and Product-Service Systems’, how these business models and their offerings have been researched in academia under the product-service system (PSS) label. Section 1.3.2, ‘Research Oversights in PSS Consumer Adoption’, demonstrates that there have been several oversights in this field and Section 1.3.3, ‘Research Questions’ presents the questions that guide the present study. Section 1.3.4, ‘Thesis Contribution’ then outlines the contributions that this thesis generates for the benefit of practice and academia, and Section 1.3.5, ‘Thesis Overview’ details the structure of the remainder of the dissertation.

The main points of this chapter are finally synthesised in 1.4 ‘Chapter Output’.

1.2 Real World Background

This section verifies the significance of the context of this research. First, the ways in which the process of producing, using, and disposing of fashion products causes various problems for the environment, resources, and human welfare on a global scale are explored. Second, several potential developments aimed at changing these

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processes, specifically the use-phase, are described to indicate how this thesis connects to current industrial practice.

1.2.1 Current Fashion Production and Consumption Systems

The textile, clothing, and footwear industry is among the worst contributors to global pollution, in both absolute and relative terms, with consumer fashion accounting for the bulk of industrial output (Choudhury, 2014).

At the production stage, clothing requires vast quantities of energy, water, and chemicals (Gwozdz et al., 2017). It takes approximately 2,700 litres of water to make a single cotton t-shirt, and the World Resources Institute (WRI) estimates that around 5 trillion litres of water are used each year in the dyeing process alone, which accounts for about 20% of industrial water pollution (WRI, 2017). Roughly 25% of industrially used chemicals worldwide are used in clothing production, and energy use in 2008 was equivalent to 132 million tonnes of coal (Gwozdz et al., 2017)—a figure that has since grown as production has risen globally. Synthetic fibres require less water, but the overall CO₂ emissions during their production are around twice those of natural fibre alternatives; furthermore, synthetic fibres disrupt ecosystems through the shedding of micro-fibres (WRI, 2017). Following the current trajectory, the textile industry is set to account for 26% of global CO₂ emissions by 2050, up from 2% in 2015 (EMF, 2017).

A glance at the use and maintenance phases of clothing products reveals that social norms concerning hygiene and cleanliness have changed in recent decades. In highly developed countries, consumers tend to wash clothing more frequently and at higher temperatures than were previously the norm (Mylan, 2015). This, in turn, shortens products' lifecycles and drives the purchase of new clothing, as repair and maintenance of clothing is uncommon among consumers in highly developed countries (Kang & Wimmer, 2008). Simultaneously, the fast-fashion paradigm emphasises the renewal and change aspects of clothing and views shopping for clothing as an activity in itself (Roos et al., 2017). Consequently, consumers buy more items but wear them for

1. Introduction

shorter periods of time (Armstrong et al., 2015). As such, the WRI estimates that average use-cycles in developed countries have more than halved since 2000 (WRI, 2017).

Finally, the scale of supply and demand growth is reflected during the disposal phase, with 16 million tonnes of clothing waste generated in the USA in 2015 and a recycling rate of just 15.3% (US EPA, 2018). In the UK, the picture is less bleak, with around 38% of sold clothing collected for reuse or recycling, although this figure is believed to have dropped since 2015, given the collapsing prices of used clothing (WRAP, 2016). Nevertheless, the amount of clothes bought in the UK rose by 200,000 tonnes between 2012 and 2016 (from 0.92 million tonnes to 1.13 million tonnes). This partially offsets recycling gains and has ultimately contributed 26 million tonnes of CO₂ emissions, with only housing, transport, and food exhibiting worse environmental performances (WRAP, 2017). Crucially, recycling and energy recovery are the least environmentally efficient options according to the waste hierarchy, which favours reducing and conserving materials, subsequent cycles of reuse, with recycling and energy recovery only as last-resort options, in accordance with the Waste Framework Directive (WFD) of 2008 or the Waste of Electrical and Electronic Equipment (WEEE) Directive of 2012. Ultimately, only around 1% of collected clothing will actually be recycled into new clothes globally, while around 73% of clothing will end up in landfills or incinerators (EMF, 2017).

In sum, the global textile and clothing industry has significant energy and resource requirements, which result in air, water, and waste pollution during production, use, and disposal. These issues, in turn, profoundly impact the wellbeing of individuals. Resource scarcity and pollution directly impact human health, particularly in impeding access to clean water and air (e.g., Lu et al., 2015; Volk et al., 2013). In the textile industry, the most directly attributable adverse effects are chronic lung diseases among the global industry's 60 million workers, due to fibre exposure (Lai & Christiani, 2013).

Beyond the individual, these problems threaten social stability and global security (Buhaug et al., 2010). Imbalanced access to resources and exposure to pollution, due to social status or geographical location—problems since the First Industrial Revolution (Allen, 2009)—cause new or refuel existing conflicts, due to perceived

1. Introduction

injustices and distribution disputes (Brainard & Chollet, 2007; Ikejiaku, 2009). Companies themselves are also facing difficulties as ‘the world is undergoing a period of intensified resource stress, driven in part by the scale and speed of demand growth’ (Lee et al., 2012, p. 10), which raises resource prices and diminishes predictability. When summed up and escalated to the national level, combatting these issues incurs significant cost. For example, China faces an annual cost of 8% of its GDP to maintain a liveable environment for the future (Li & Yu, 2011)—money that could be spent on supporting welfare.

Looking at the bigger picture, consumer clothing and fashion is a prime example of an industry that follows the ‘linear economy’ paradigm. The linear economy is essentially a stylised synopsis of neoclassical economics from an environmentalist’s perspective, and criticises the pursuit of ‘growth for growth’s sake’ (Jacobs & Slaus, 2010, p53). As resources are assumed to be infinite and pollution ostensibly believed to be absorbed by the environment, the industry focuses on maximising throughput—raw materials are manufactured into products which then inevitably become waste. As such, the linear economic system is described as a take-make-dispose model of production and consumption, as ‘open loops’ at every stage release pollution and waste into the environment (see Figure 1-1).

1. Introduction

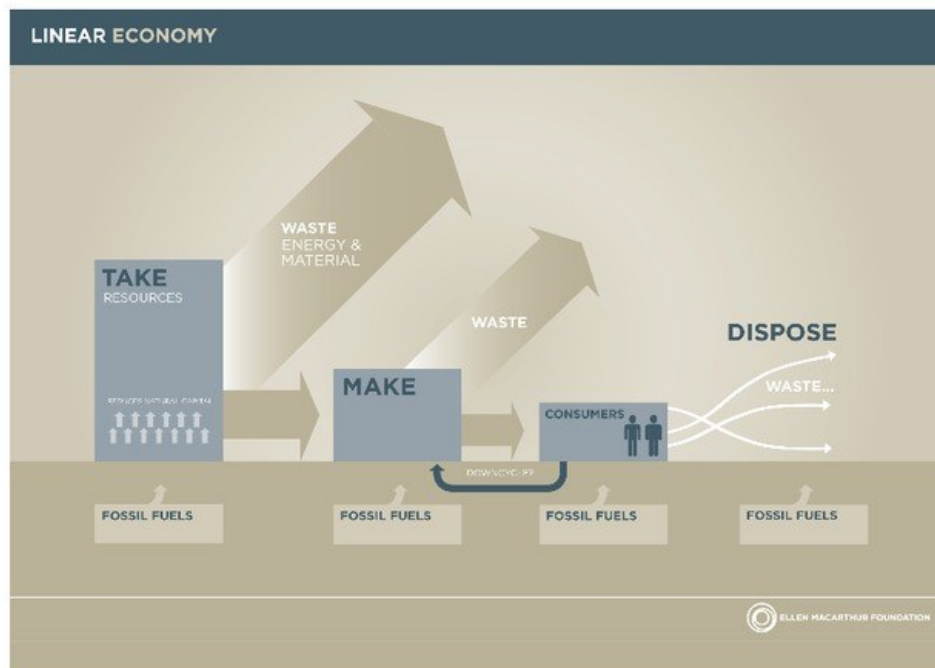


Figure 1-1: The Linear Economy (EMF, 2015).

To summarise, ‘the perpetual consumption of fashion goods... is central to the economic interests of this \$3 trillion global industry. The very infrastructure of the industry is designed to consume materials [and] material consumption is inseparable from revenue generation’ (Armstrong et al., 2015, p. 31).

1.2.2 Towards More Sustainable Fashion Consumption

Several organisations, companies, and initiatives, however, seek to move away from the linear economy paradigm in the fashion industry and ‘close the loop’.

Think tanks, such as the Ellen MacArthur Foundation (EMF), organise support from large fashion retailers to commit to more sustainable production technologies, more recycled content in clothing, or expansion of recycling networks. Similarly, the Global Fashion Agenda Think Tank has drawn up goals for the industry, and during the

1. Introduction

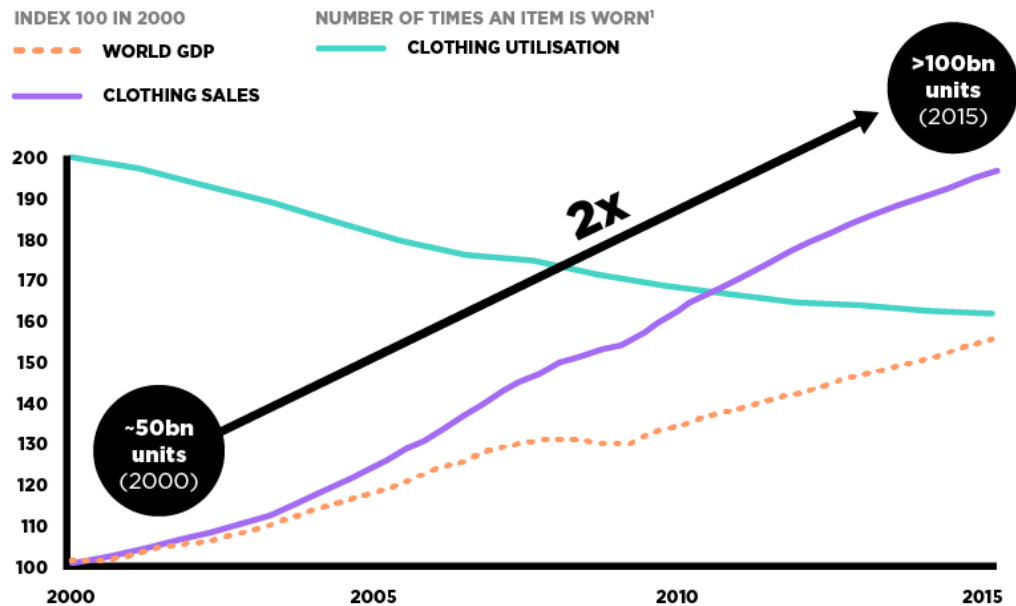
Copenhagen Fashion Summit in 2017, a ‘2020 Circular Fashion System Commitment’ was signed by 94 companies serving 12.5% of the global fashion market (Global Fashion Agenda, 2017). While such support and commitments are steps in the right direction and should be appreciated, the agreed goals often remain vague and unambitious. Adidas’ only commitment, for example, states that ‘By 2020, a garment collection scheme will be rolled out in all stores in key markets including Paris, London, New York and Los Angeles.’ Of the 94 companies, 21 have signed the commitment without committing to any targets. There are some exceptions to this, with some companies, such as H&M, that agreed on several goals; however, these exceptions remain rare and the overall effects of such voluntary initiatives are yet to be seen.

Meanwhile, there are already alternatives to the take-make-use-dispose model of fashion production and consumption in the market that specifically target the use-phase to reduce the total amount of fashion products needed. An example of such an alternative is fashion libraries, where consumers can try out new styles for a limited time at a fraction of the new retail price. While they also contribute to local urban communities and serve as social hubs, ‘at present, fashion libraries remain a small-scale phenomenon with difficulties reaching the mainstream market, not least due to... conventional fashion consumption patterns’ (Pedersen & Netter, 2015, p. 258).

Clothing swaps and other consumer-to-consumer (C2C) sharing methods also tie into this social aspect but also mitigate the overall environmental impact by reducing fashion production. These offerings remain confined to specific contexts, and the attitudes and personal values of their consumers tend to differ from those of the general population (Halme et al., 2004; Piscicelli et al., 2015). Another established option is the design and manufacturing of more durable clothing with extended warranties and repair commitments, but this is mostly exclusive to premium brands with urban, affluent consumers with strong environmental and social mindsets (Stål & Jansson, 2017). It is unsurprising, therefore, that overall clothing sales continue to increase steeply, as the majority of consumers have not embraced these alternatives (see Figure 1-2).

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Growth of clothing sales and decline in clothing utilisation since 2000



Average number of times a garment is worn before it ceases to be used
Source: Euromonitor International Apparel & Footwear 2016 Edition (volume sales trends 2005–2015); World Bank, World development indicators – GD (2017)

tiny.cc/fibres

Figure 1-2: Development of clothing sales and utilisation (EMF, 2017).

There have recently been new developments in the market, however. In the wake of the success of eCommerce fashion retailers such as ASOS, other newcomers seek to transfer the mechanism of fashion libraries and clothing swaps to the Internet (Park & Armstrong, 2017). Bag Borrow or Steal, for example, lets consumers lease designer handbags for one-month periods, with options to extend this period, buy the handbag, and re-sell it at a later date (Bag Borrow or Steal, 2019). Similarly, consumers may rent dresses for single days for events and occasions from Girl Meets Dress (Girl Meets Dress, 2019). A common element to these companies' approaches is that they seek to leverage a relatively small amount of clothing to serve the needs of many, via an online delivery sharing business model—similar to how car-sharing and -pooling services

1. Introduction

operate. The needs of these companies' customers are often highly specific in terms of scope and time (Park & Armstrong, 2017), and it is unclear whether any environmental savings actually result, as they may simply motivate 'hyperconsumption' rather than sufficiency (Retamal, 2017). Girl Meets Dress, for example, actively recommends that consumers order several different dresses in different sizes, while only paying for that which is ultimately worn, and claims no explicit environmental ambitions (Girl Meets Dress, 2019). This increases the likelihood that the customer will find a suitable dress, but also severely diminishes the expected environmental savings, as more assets are utilised, transportation costs are increased, and wear-and-tear reduces products' lifespans.

Overall, these businesses currently pose no threat to mass retailers, as they focus on narrow niches characterised by low use frequency or duration and high-value products. Nevertheless, these business models, funded by significant venture capital, are poised for global expansion (South China Morning Post, 2018; The Guardian, 2017) against a backdrop of consumer desires for faster change at lower cost, the industry's desire to continuously generate revenue, and the realities of the state of our environment. It is to this emerging development of industrial practice that this thesis connects.

1.3 Thesis Objectives

This section examines how the previously described emerging business models in fashion have been researched in scholarship. Several oversights in the understanding of consumer adoption of such offers have emerged, which threaten their potentially transformative environmental benefits. These oversights are translated into two research questions, and responding to these research questions will the thesis to make a trifold contribution to sustainability at large, practice, and academia. The section concludes with an overview of the further structure of the thesis.

1. Introduction

1.3.1 New Economies and Product-Service Systems

In research, the new fashion business models described in 1.2.2 New Systems of Fashion Consumption are discussed under the broad labels of the circular and the sharing economies. While there are numerous definitions of these concepts (Masi et al., 2017), both are sustainable development models that rely on the continuous cycling of physical products to meet more needs with less virgin material and energy. Driven by government initiatives (Su et al., 2013) and think tanks (EMF, 2013), which recognise the cost of unsustainability, both concepts are researched from a variety of perspectives with significant overlap. Overall, however, the circular economy emphasises products' production and disposal phases to achieve environmental gains through refurbishment, remanufacturing, and recycling (Geng & Doberstein, 2008). Meanwhile, the sharing economy stresses the reuse of products by different users to reduce the number of products in circulation at any given time (Cohen & Kietzmann, 2014).

Considering that both concepts will impact the ways in which consumers acquire, use, and dispose of products, researchers assert that product and business model designs are major challenges to the implementation of the circular and sharing economies (Bocken et al., 2016; Kortman & Piller, 2016). However, in view of what such products and business models must achieve to facilitate environmental gains (see Figure 1-3), it is questionable whether companies or consumers are interested in slowing (i.e., using items for longer), narrowing (i.e., using fewer items), or closing (i.e., recycling more items) resource flows (Murray et al., 2017). Rather, it appears that—particularly in the fashion industry—consumers are more driven by a desire for low prices, large volumes, and fast change, to which the industry has adapted and delivers with financial success. Attempting to re-educate consumers or re-structure the industry from the top down to achieve systemic change, therefore, seems difficult at this point.

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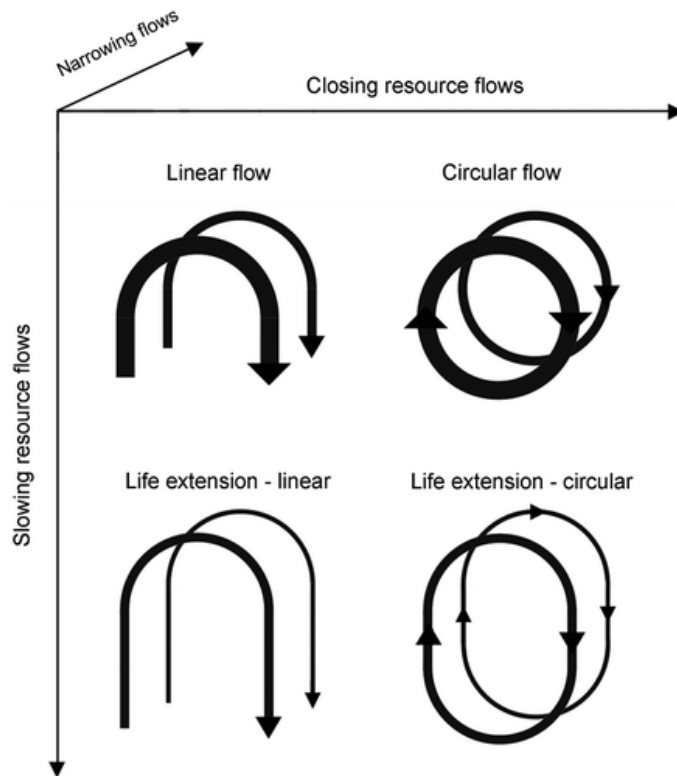


Figure 1-3: Resource flows for greater sustainability (Bocken et al., 2016, p309).

One concept that seeks to strike a compromise between the reality of consumer preferences, the persistence and impetus of industry structures, and the necessity of environmental improvements are product-service systems (PSS). PSS are defined as ‘a marketable set of products and services capable of jointly fulfilling a user’s need’ and it is generally assumed that they contribute to sustainability (Goedkoop et al., 1999, in Mont, 2002). PSS have received considerable scholarly attention in recent years, driven partly by the impetus of the circular and sharing economy, but also because they offer benefits to companies similar to those envisioned by servitisation (Baines et al., 2009). However, several oversights remain in this stream of research. While the existing research will be reviewed and discussed in greater detail in the literature review chapter, these oversights are summarised in the following to pinpoint where this thesis seeks to make its contribution.

1.3.2 Research Oversights in PSS Consumer Adoption

To realise the environmental potential of PSS, it is crucial to address the initial question of whether the customer is actually prepared to buy bundles of products and services that come with different rights and responsibilities to conventional alternatives based on ownership and ‘self-service’. As such, this thesis adopts the rationale that while the challenges to our environment are significant, solutions lie in the interplay between corporate and consumer interests. This means that in this research the focus will be on the economic feasibility of PSS that are assumed to contribute to environmental sustainability, instead of sustainability itself. In this field of research, three neglected areas have emerged that stifle further research and implementation of PSS, delaying the transition to a more sustainable development model.

In the case of business-to-business (B2B) PSS practice, success and research activity have been higher than in consumer contexts (Tukker, 2015), mainly under the label of ‘industrial product-service systems’ (IPS2) (Meier et al., 2010). This is despite early optimism for business-to-consumer (B2C) PSS particularly (Mont, 2002) and the statement that ‘the relative advantages [will be] the main drivers for the diffusion of PSS’ (Rexfelt & Hiort af Ornäs, 2009, p676). Similarly, relative disadvantages have also been claimed to impact adoption. Most progress has been made by researchers who have explored specific product categories—prams, for example (Catulli & Reed, 2017; Mont et al., 2006)—to identify which advantages or disadvantages may be the most relevant. This follows the assumption that ‘[PSS] are best explored in small niches’ (Armstrong & Lang, 2013, p11), as the specifics of the PSS, its associated business model, its product category, its targeted consumer group, and the legal, cultural, and physical backdrop matter to adoption propensity.

Following these findings, several factors have been proposed by a range of qualitative studies (e.g. Bocken et al., 2018; Cherry & Pidgeon, 2018; Chian Tan et al., 2017; Poppelaars et al., 2018; Retamal, 2017; Rexfelt & Hiort af Ornäs, 2009). The few quantitative studies in the field have divided their attention between several different PSS options, ultimately also proposing potential factors hypothesised to impact on

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consumer adoption rather than confirming them (e.g. Armstrong et al., 2015; Catulli & Reed, 2017; Rapaccini & Visintin, 2015). Both types of study have advanced the field tremendously. However, given the sheer number of advantages and disadvantages of PSS mentioned in recent literature reviews (Annarelli et al., 2016; Beuren et al., 2013; Reim et al., 2013; Tukker, 2015), those that are actually relevant to consumers have yet to be determined. As such, customer acceptance remains the most commonly proposed barrier to PSS diffusion in the literature (Annarelli et al., 2016). This forms the first oversight in current research and also directly impacts on the practical viability of PSS. In this thesis, a variety of factors impacting on consumer adoption are investigated through the lens of perceived values and risks in the case of a specific PSS from the area of fashion. The investigated factors here are diverse and touch upon utilitarian, emotional, and experiential drivers or barriers that consumers may perceive when confronted with radically different PSS.

The second research oversight is related to the first. Researchers have struggled to theoretically underpin their attempts to explain PSS consumer adoption, resulting in the claim that ‘user acceptance remains a black box’ (Vezzoli et al., 2015, p7). While activity theory (Rexfelt & Hiort af Ornäs, 2009) or practice theory (Mylan, 2015) approaches have been proposed, it may be argued that these theories are more applicable to researching consumer acceptance—i.e., continued use of PSS after first purchase—than first adoption (Poppelaars et al., 2018). Another criticism here is that both activity and practice theory, which the majority of studies on consumer adoption have implicitly followed, can only account for some of the factors that have been proposed to explain PSS adoption. This stifles development in the field, as the variety of proposed advantages and disadvantages is difficult to structure sensibly to result in testable frameworks. Here the thesis contributes by developed a framework that can be adapted to reflect such proposed advantages and disadvantages in a given PSS case.

Finally, PSS that implement significant and deliberate environmental ambitions are rare in practice, which may be explained by the manifold risks imposed on a provider as they transition to an approach that offers PSS (Aurich et al., 2009). Consequently, PSS have often been studied using hypothetical examples, and a finding common to these studies is that the trustworthiness of the PSS provider is a key concern among

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consumers (Armstrong et al., 2015; Rexfelt & Hiort af Ornäs, 2009). Whether or not a trustworthy PSS provider could actually mitigate these concerns or provide assurance regarding the benefits to the consumer is uncertain, however. Similarly, it is not clear how trust, or a trustworthy brand, could be brought to bear by a provider to improve consumer adoption of PSS. As such, scholarship has not progressed beyond asserting that trust is important for PSS adoption, and has failed to specify what the exact effects of trust might be and whether it is correct to speak of trust as a single-dimensional construct. This forms the third research oversight and here this thesis seeks to contribute by investigating if a radically different PSS offered by a highly trusted brand would be attractive for consumers and whether such trust could be utilised through product information detailing the PSS.

It is argued that in sum, these three research oversights present the most pressing challenge to the adoption of environmentally sustainable PSS by consumers in current literature, which is mirrored by the sparsity of such offers in practice.

1.3.3 Research Questions

This thesis aims to address the identified research oversights ‘by answering the research question[s] posed by the researcher’ (Ahlström, 2016, p. 68), which broadly corresponds to the established logic of ‘gap spotting’. Nevertheless, Sandberg and Alvesson’s (2010) critique of this mode of research is addressed by couching this research in a practical context, which has been shown to encounter problems in terms of mass-market diffusion. Two research questions underpin this thesis:

RQ1: What are the drivers for and inhibitors to consumer adoption of PSS?

RQ2: How can PSS providers leverage a high degree of trust to increase consumer adoption of PSS?

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1.3.4 Thesis Contribution

Addressing these research questions will allow this study to make three types of contributions.

First, this thesis contributes to scholarship. The assessment of which proposed drivers for and barriers to PSS adoption are impactful in consumer contexts will allow other researchers to focus their future efforts on factors that may be expected to be relevant. This allows the field to study facets of consumer adoption in greater detail, as unimpactful factors may be disregarded while impactful factors are explored. This assessment is facilitated by the thesis' introduction and application of a theory that has not previously been utilised in PSS consumer adoption research. The generic framework resulting from the application of the theory may be adapted by other researchers to quantify which factors drive consumer adoption in given PSS configurations, and explore how interventions may improve adoption propensities. In addition, this thesis refines the understanding of consumer trust in PSS providers, indicating that there are more distinct features to this factor than have previously been assumed.

Second, this thesis makes a practice contribution, as it enables PSS providers or companies seeking to introduce PSS in the future to make better decisions, which ties in with the benefits cited in the servitisation literature. Knowing which factors attract consumers to PSS and how their interest may be increased is critical to their diffusion. Diffusion, in turn, is a prerequisite to achieving greater sustainability on the one hand, but also to meeting companies' financial objectives and competitiveness on the other hand. Furthermore, the role and function of a trusted brand in PSS provision is explored, which is of interest to established companies seeking to branch out into PSS. On a similar practice note, but moving away from the provider, sensible design and delivery of PSS may also benefit consumers in the sharing economy of the future.

Third, on a macro-level, this thesis contributes to solving the problem of sustainability, as the production and consumption of fashion in its current form is shown to impact negatively on the environment and human welfare. This is an incremental contribution but also validates the significance of the research topic overall.

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These contributions will be achieved in the context of a hypothetical fashion PSS containing characteristics that diverge significantly from the ‘linear economy’ to promise environmental gains. Consumer adoption of this PSS is investigated in a quantitative research design with consumers.

1.3.5 Thesis Overview

This thesis is divided into seven chapters following a classic structure. Each chapter contains multiple sections that are preceded by a chapter introduction and conclude with a chapter output section.

Following this introductory chapter, Chapter 2, ‘Literature Review’, initially introduces the PSS concept and its terminology in greater detail and in relation to its academic background. Afterwards, that which is both known and unknown in the area of consumer adoption of PSS is summarised to shed more light on research oversights. Prospect theory is then introduced to develop a theoretical framework suitable to empirically address the previously developed oversights and to provide a platform for this investigation.

Chapter 3, ‘Model Development’, provides an overview of PSS examples in the area of fashion and apparel before choosing one PSS suitable for exploring consumer adoption further. This PSS is then combined with the previously developed theoretical framework to form an applied framework that will be investigated in this thesis.

Chapter 4, ‘Research Design and Methodology’, details the methodology, a questionnaire-based experiment based on SEM. Data collection procedures and a pilot study were devised to confirm the effectiveness of the proposed questionnaire.

Chapter 5, ‘Results’, analyses and presents the empirical results of this study. The chapter is divided into three sections that set up the analysis of the study’s questionnaire element in the fourth section. The final section then looks at the results of the experimental element. The same distinction is mirrored in Chapter 6, ‘Discussion’, which considers the results in light of the existing research.

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Finally, Chapter 7, ‘Conclusion’ summarises the key findings of this research and offers answers to the research questions. The thesis’ contributions to knowledge and practice are then outlined. This chapter also describes the study limitations and how these, as well as the results of this study, open avenues for future research.

1.4 Chapter Output

This chapter has served as an introduction to the thesis, and has generated the following findings:

- The current system of fashion production and consumption impacts negatively on the environment, resource security and human welfare.
- Established solutions either lack ambition or are not sufficiently popular among consumers to be considered transformative for mass markets.
- Newer business models based on mixed bundles of products and services may be able to align corporate, consumer, and environmental interests and enter mainstream consumer culture.
- Practice examples in the area of fashion are few and do not yet compete with global players due to their narrow focus.
- In academic literature, gaps have emerged relating to the matter of consumer adoption of such offers, which are researched using the PSS label.
- This thesis seeks to answer two research questions to enable PSS providers to design and offer better fashion PSS and to enable researchers to study PSS consumer adoption with increased accuracy and robustness.

2. Literature Review

2.1 Chapter Introduction

The literature review is divided into five sections after this introductory section.

Section 2.2., ‘PSS Background and Terminology’, looks at the relationship between PSS and closely related research fields in Section 2.1.1 ‘Service Science, Servitisation, and PSS’, to discriminate between PSS and related developments in academia. Afterwards, Section 2.1.2 ‘PSS Typologies and Sustainability’, demonstrates how PSS are configured in practice, in relation to assumptions about their environmental performance.

Section 2.3, ‘Consumer Adoption of PSS’, assesses what is known in scholarship on the topic at hand. Prominent theories used to predict adoption or explain acceptance of PSS are highlighted and their application critically discussed in Section 2.3.1, ‘Theoretical Approaches in PSS Research’. Afterwards, in Section 2.3.2, ‘Significant Change Dimensions’, the empirical findings of this literature are separated into three broad areas that drive or impede PSS diffusion among consumers. Finally, one crucial but neglected area (trust and product information) is scrutinised in greater detail in Section 2.3.3, ‘Provider Trust and Information’.

Section 2.4, ‘Prospect Theory in Consumer Decision-Making’ argues for the use of prospect theory as a theoretical backdrop in ascertaining why consumers adopt PSS. An overview of the background of prospect theory is given in Section 2.4.1, ‘Deterministic Decision Theories’, after which prospect theory is detailed in Section 2.4.2, ‘Cumulative Prospect Theory’. This concludes with Section 2.4.3, ‘Applying Prospect Theory Principles in Consumer Adoption of PSS’, which develops the theoretical framework used in the thesis.

Finally, 2.5, ‘Chapter Output’ summarises the most relevant points of this chapter.

2.2 PSS Background and Terminology

This section sets up the remainder of the literature review. First, the overlap between PSS and closely related developments in marketing and operations management are assessed to clarify how PSS should be approached as a research topic. Afterwards, the generic definition of PSS given in the introduction is supplemented with its most commonly used typology, which enables a closer consideration of the range of offers that PSS includes. This part of the section also clarifies the relationship between the PSS's offer and business model, and what environmental benefits may be expected from its diffusion.

2.2.1 Service Science, Servitisation and PSS

While sales of physical goods and services have co-existed throughout history, academia has only recently placed much emphasis on the latter. Spurred by the decline of the manufacturing industry, services have become more important for Western nations since the 1950s, and this has necessitated a more in-depth consideration of this area (Roy, 2000).

In marketing, the 4Ps (product, price, place, and promotion) framework proposed by McCarthy (1960) started to change the dominant paradigm from the promotion of physical goods in a relatively undefined market to the targeted satisfaction of specific customer needs (Baines et al., 2009). This focus on customer needs allowed the discipline to move from a materialistic perspective, whereby value is added through the transformation of raw materials into products, towards a more open appreciation of the fulfilment of needs with no inherent preference as to how these needs should be met. Marketing thus embraced services as devices equal to physical goods in their function (Levitt, 1983).

To warrant such a distinction, however, it needed to be argued that services and physical goods are fundamentally different (Heiskanen & Jalas, 2003). Edvardsson et al. (2006, p. 108) claim that the initial division between services and goods was made along the attributes of inseparability, heterogeneity, intangibility, and perishability of

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services vis-à-vis physical goods, with this distinction ‘used not only to build the research field but also to defend service research.’ Other definitions follow this idea of intangibility, but also recognise that services do not result in the transfer of ownership rights (e.g., Gadrey, 2000). More recently, Spring and Araujo (2009) have offered a ‘service logics’ definition of service as a) a ‘request for intervention’, drawing on a human’s skill in conjunction with a physical good to perform a process; b) a ‘right to use a capacity’, i.e., renting/using a capacity temporarily to provide benefit; and c) a ‘performance’, whereby the skill of a human generates value.

The drive was completed through the establishment of service science as a distinct field through Vargo and Lush’s (2004) seminal paper on the ‘service-dominant logic’ (S-D logic) in the *Journal of Marketing*. To offer a heavily simplified summary, S-D logic claims that service exchanges are at the heart of human economic activity and value (co)-creation in any industry. This is because the provision of services underpins the production and consumption of physical goods as services are required to produce the physical good. Similarly, the physical good is valued because it provides a service to the consumer during its use. Companies, therefore, exist to develop service ecosystems that facilitate service exchanges and maximise value co-creation. This represents the extreme end of the spectrum in terms of how services are understood in marketing.

Analogous to the developments in marketing, in the area of engineering and operations management (OM), services have been discussed before the backdrop of increasing competition for Western manufacturers from lower cost economies (Baines et al., 2009).

Here, the distinction between physical goods and services was embodied in the concept of servitisation, initially proposed by Vandermerwe and Rada (1988) in the *European Management Journal*, and positioned as a strategy for manufacturers to avoid competition and/or increase profitability. This is to be achieved by adapting manufacturers’ offerings: ‘servitization is defined as the journey or transformation process whereby an organisation enables its product-service offerings’ (Martinez et al., 2010, p. 4), shown in Figure 2-1.

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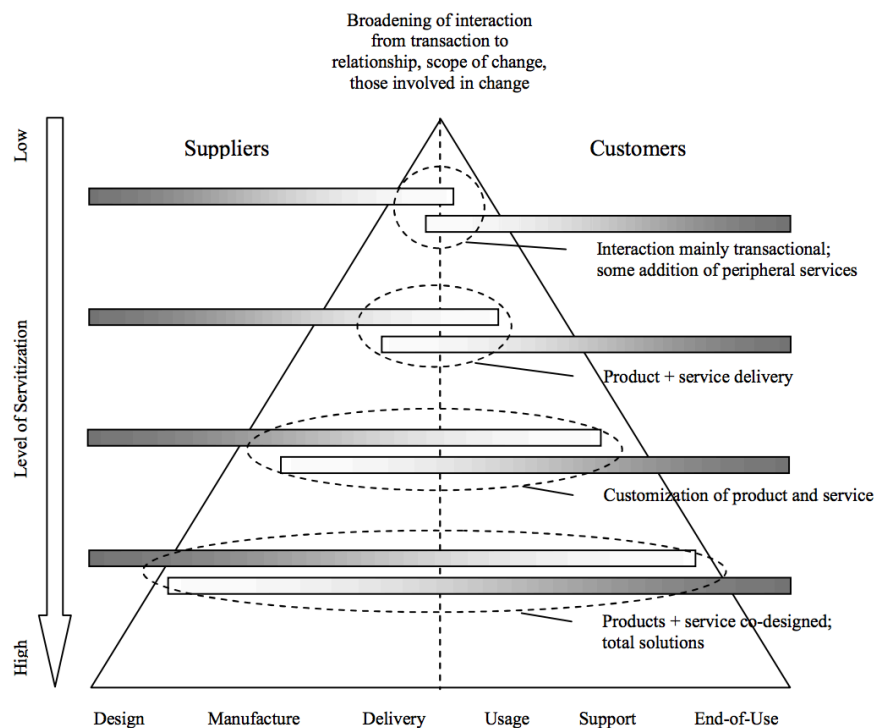


Figure 2-1: The servitisation continuum(Martinez et al., 2010, p. 4).

The assumption here remains that services are more difficult to imitate than purely physical products, result in steady revenue flows, and foster relational rather than transactional customer relationships (Oliva & Kallenberg, 2003; Roy & Cheruvu, 2009). A primarily Western narrative has been woven around servitisation with the aim of positioning the concept as a way of ‘staying ahead’ of competitors from developing economies in a challenging market environment (Luoto et al., 2017).

Neither service science and S-D logic nor servitisation originally made environmental considerations integral to their approaches. Scholars in both areas only later recognised the potential for the environmental benefits of services through the substitution of product artefacts (Baines et al., 2009; Heiskanen & Jalas, 2003).

Baines et al. (2009) thus claim that the servitisation literature and the work on PSS have largely developed separately from one another and have only recently coalesced around similar definitions of services and the assumption that customer needs should be an object of focus, which mirrors S-D logic in its ends, with servitisation being

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proposed as the vehicle to prepare a manufacturer for such offerings. PSS are, instead, a Scandinavian and Dutch concept motivated by environmental goals (Vezzoli et al., 2015). Park et al. (2012) argue that these origins place PSS among several closely related European concepts (see Table 2-1). These are summarised as integrated product-services (IPS), rooted in the engineering field of sustainable product design and lifecycle analysis, and which stress the direct satisfaction of needs through the provision of functionality with intertwined product-service bundles. From this perspective, PSS and servitisation have only recently begun to converge (Tukker, 2015), since it has become clear that the ‘what’ in the PSS is intimately linked to the ‘how’ of servitisation.

Table 2-1: Comparison between marketing- and engineering-oriented IPS

(Park et al., 2012, p. 537).

Property	Marketing-oriented IPS	Engineering-oriented IPS
Concepts	<i>Bundling, Systems Selling, Full Service, Service Package, Product Service, Installed Base Service</i>	<i>Solution, Integrated Solution, EEPS, PSS, Functional Sales, Functional Product, IPSO</i>
Underlying assumption	Product/service duality	Product/service unity
Features		
Primary purpose	Sales promotion through differentiation	Providing functions for problem solving
Point of integration	Downstream of value chain (sales, customer service)	Upstream of value chain (R&D, design)
Degree of customizability	Low	High
Background		
Region	United States	Europe, Japan
Discipline	Marketing	Engineering

As such, only more recent PSS literature has drawn on servitisation, as well as S-D logic to a lesser extent, and primarily to a) validate what providers may expect when transitioning from selling pure physical goods to providing PSS and b) to inform them as to how such a transition may best be executed (Tukker, 2015). Baines et al. (2009, p. 4) reconcile the fields by stating that ‘servitization is the innovation of an organisation’s capabilities and processes’ towards being in a position to provide PSS, creating more mutual value than is yielded from simple selling—this aligns with the co-creation espoused by S-D logic. More recently, Lightfoot et al. (2013) confirmed

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the ongoing dispersal of knowledge among the marketing, OM, and engineering disciplines, but also observed that interests have begun to converge on five topics.

From the providers' perspective, therefore, PSS follow the same impetus as servitisation, which implies that sustainable competitive advantages may be achieved in a competitive environment by developing closer customer relationships, adopting a customer-centric perspective that is focused on needs, and meeting such needs through difficult-to-imitate product-service bundles. PSS, however, extend this with environmental objectives, which are more frequently reported than financial objectives in research, and focus particularly on the business model and product design aspects (Reim et al., 2015).

2.2.2 PSS Typologies and Sustainability

PSS should thus be examined within its own stream of research that has emerged since Goedkoop et al.'s (1999) and Mont's (2002) seminal contributions. While Goedkoop et al.'s (1999) and Mont's (2002) definitions of PSS continue to be adopted by the majority of researchers, they form just one of two building blocks that are integral to how PSS research is conducted in academic literature.

This situation arose because these initial definitions are too vague to adequately describe and categorise the heterogeneity of existing and studied PSS. Various scholars sought to rectify this issue and numerous typologies and taxonomies have been proposed by scholars (Park et al., 2012, Van Ostaeyen et al., 2013). In this research Tukker's (2004) archetypes will be used to as it remains the most established (e.g., Bocken et al., 2018; Catulli et al., 2017; Chamberlin & Boks, 2018; Poppelaars et al., 2018) and is able to reflect that 'solutions can be composed in an infinite number of ways' (Rexfelt & Hiort af Ornäs, 2009, p. 667) by giving broad and integrative labels. This typology includes three types of PSS, which can be further divided into eight specific subcategories (see Figure 2-2).

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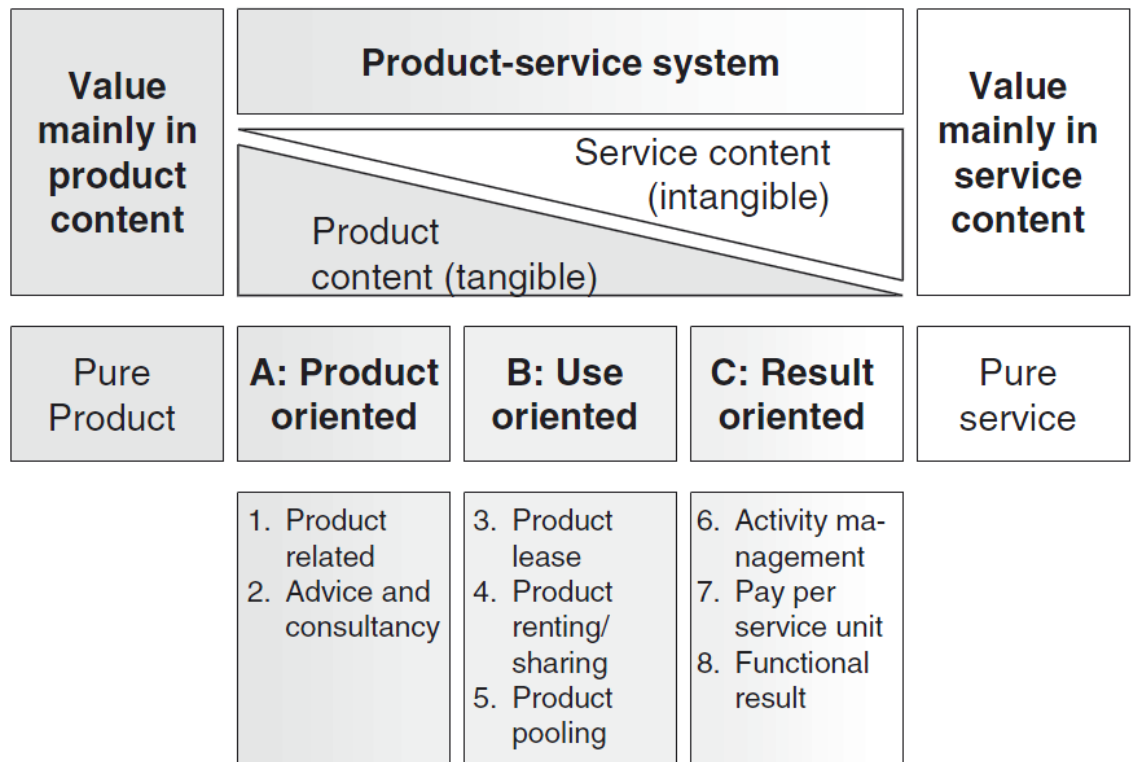


Figure 2-2: Overview of PSS types (Tukker, 2004, p248).

Figure 2-2 shows that PSS exist along a product-service continuum, with product-, use-, and result-oriented PSS gradually reducing the product component and increasing the service component. Movement along this continuum does not necessarily imply that dematerialisation takes place, only that the perceived value of the offer is increasingly bound in the service component of the PSS. As such, environmental potentials are assumed to increase in response to movement towards the right along the product-service continuum (Reim et al., 2015; Tukker, 2015), but this is discussed in the following section through an examination of which mechanisms the different PSS types employ to meet demand.

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Product-oriented PSS

Product-oriented PSS imply that a product is complemented by services that seek to extend products' lifecycles and/or ease their disposal. These services are often sold separately from the products themselves, as optional add-ons or subscriptions (Vogtländer et al., 2002). Examples of such services include consultancy or advice on product use or disposal, maintenance and repair services, updates and upgrades, or disposal services at the end-of-life (Manzini & Vezzoli, 2003; Tukker, 2004). In product-oriented PSS, ownership of the physical product typically remains with the customer and the customer engages in 'self-service' to extract value from the product (Cook et al., 2006).

Assessing the environmental performance of any PSS is not straightforward. In product-oriented PSS, the provider is incentivised to design the product to be repairable, upgradable, or refurbishable, so that it can meet contractual obligations more efficiently, and this can result in environmental benefits, as lifecycles are extended (Bocken et al., 2016). However, the primary revenue mechanism usually remains the sale of products, as the services contribute relatively little. In such cases, the provider lacks the incentive to ensure that products are used for longer in practice, and technological or stylistic obsolescence may be incorporated into the product's design to motivate premature purchases even if the product is functionally still viable (Tukker, 2015). This corroborates the observation that consumers cease to use products before their absolute obsolescence for a variety of reasons (Cooper, 2004). As product ownership remains with the consumer, it is unclear whether reuse, refurbishment, or recycling occurs unless specific legislation, such as the WEEE directive, is enacted. Similarly, in product-oriented PSS cases, the products may not be designed to reduce energy consumption in use, as these costs are borne by the user-owner (Tukker, 2015). As such, product-oriented PSS are assumed to offer limited scope for environmental savings.

In practice, take-back systems or other product-oriented PSS features have become common in only some product categories (Retamal, 2017; Tukker, 2015), and research on pure product-oriented PSS is scarce. The limited environmental potentials of many product categories are partly to blame; also use- and result-oriented PSS, which often

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already include product-oriented PSS features also offer more exciting insights, as they diverge more significantly from conventional products and business models.

Use-oriented PSS

Use-oriented PSS typically involve products that are owned not by the user, but by the provider, and which are made temporarily available to users for a one-off fee, a subscription, or a mixture of both (Tukker, 2004). The service component in such cases focuses on ensuring this availability, which includes maintenance and repair services (Chian Tan et al., 2017). Availability may be previously agreed and restricted to a specified time and product, for example, in the case of conventional car-rental services. Most use-oriented PSS examine less conventional cases, however—for example, free-floating car-sharing schemes, which differ from conventional car-renting in that access is managed on a first-come-first-serve basis, payment depends on actual usage, usage times are shorter, and there is greater flexibility for both parties (Alfian et al., 2014).

There is an assumption in scholarship that the environmental potentials are greater for use-oriented PSS than for product-oriented PSS, as, in the former, the provider has an incentive to maximise the lifecycle of the product to reduce the costs of providing the specified access (Tukker, 2015). This includes cascaded cycles of reuse, repair, refurbishment, and recycling, with resale into other markets a prominent option (Gregson et al., 2015). Gains are especially high when the product's designer and manufacturer also acts as the service provider, because then assets can be designed with these objectives in mind (Baines et al., 2007). When this is not the case, this potential may drop significantly (Tukker, 2004), although the PSS can still benefit the environment by replacing the production of products that would otherwise be necessary. This is because use-oriented PSS improve product utilisation, which decreases the total number of products required to meet a limited number of temporal needs. However, this point is also not necessarily valid, as users may treat shared products with less care than they would their own, forcing the provider to replace them disproportionately often (Retamal, 2017). Even so, frequent replacement may be desirable in some cases, as technology advances and new products are designed to be more energy efficient (Heiskanen & Jalas, 2003). Another issue is that consumers may

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still prefer products with unnecessary functionality and high energy use, even if these are more expensive, and the provision of these is not disincentivised for the provider.

Likely the most significant threat to the environmental superiority of use-oriented PSS, ‘hyperconsumption’ (Retamal, 2017), is one dimension of what Zink and Geyer (2018) describe as ‘circular economy rebound’. Severe rebound effects in PSS may be expected when PSS consumption does not replace the production and consumption of conventional alternatives, but rather adds to it. For example, if cars become an overall cheaper and more convenient transport medium than public transportation because of highly competitive car-sharing PSS, the PSS might actually harm the environment because consumers with lower income could now afford to drive in some situations. Even if the PSS were to simultaneously replace car-ownership for some consumers with higher incomes, the total environmental gains are nonetheless reduced.

Result-oriented PSS

Finally, result-oriented PSS involve products with extensive service components that are optimised for the job they are supposed to do. Ownership of the product remains with the provider, as does the choice on how to meet the customer’s needs and all associated responsibilities, as merely a specified result or function is sold. In these cases, the provider can leverage its customer knowledge and experience in product design and delivery (Tukker, 2015). The focus, therefore, moves away from the product and service component to the specification of the exact result that is desired. Use-oriented and result-oriented PSS are not mutually exclusive, as the same renting, leasing, or sharing mechanisms may still underpin the PSS if needs are temporary.

Result-oriented PSS, therefore, combine the environmental benefits of the other two types in terms of repairability, asset utilisation, etc. However, since the provider is only paid for meeting a need, he is also incentivised to ‘satisfice’ – that is, to provide a stripped-down, energy efficient product that saves on manufacturing and running costs but still achieves its specified function (Baines et al., 2009).

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An example of a product category that has resulted in all PSS types are washing machines. Washing machines may be sold or leased to consumers with comprehensive maintenance and repair services, which are established examples of product- and use-oriented PSS (Bressanelli et al., 2017, 2018). Clean clothing may also be offered as a functional result, whereby consumers specify the amount and type of laundry they need cleaned per month, with the provider placing a potentially pre-used but ‘right-sized’ and regularly maintained washing machine on the consumers’ premises with fixed pay-per-use costs. As the pay-per-use costs are higher for warmer wash cycles, consumers are motivated to wash at lower temperatures, which benefits the environment, but this is achieved through monetary incentives rather than appeals to consumers’ environmental attitudes (Bocken et al., 2018; Bressanelli et al., 2018).

PSS, Business Models and Sustainability

Two outputs emerge from a review of the literature on PSS types and sustainability.

First, it is clear that the different PSS types cannot be fully divorced from their underpinning business models. The offer itself, the activities necessary to deliver it, and the value generation and capture mechanisms are intertwined (Vasanthan et al., 2012), which validates Mont’s (2002) and others’ comparison of PSS to ‘traditional business models’. PSS, as the offer and business models supporting ‘activity systems’ driving value generation and capture (Zott & Amit, 2010), thus converge, as certain PSS types appear to fit naturally with certain value generation and capture mechanisms.

Second, there is no clear answer as to the extent to which PSS achieve superior environmental performance barring dematerialisation, which would ‘require the most radical change in business model’ and is daunting to companies (Tukker, 2015, p. 13).

In practice, and considering the previously elaborated issues, the environmental potentials are below the initial optimistic expectations but remain significant when the full lifecycle perspective is considered (Scheepens et al., 2015; Vezzoli et al., 2015). Figures depend heavily on the context, but several consumer product category cases report environmental improvements of 50% and above (Tukker, 2015), although, in most cases, gains are likely to be more moderate (Mont et al., 2006). Overall, it appears

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that if a PSS can extend a product's lifecycle of a product beyond what is common in a conventional business model, environmental benefits will ensue: 'whether a system shortens or extends the lifetime of products was a key factor [...], not whether the system itself was a lease system or a possession system' (Tasaki et al., 2006, p9).

2.3 Consumer Adoption of PSS

Having effected a more complete overview of the types of PSS and their impact on the environment, this section progresses to first review and discuss theories that have been used to structure enquiries into the diffusion of PSS among consumers. The applicability of these theories is critiqued, which expands on the research gap identified in the Introduction. Subsequently, the most important empirical findings on reasons for and against the diffusion of PSS among consumers are separated into three broad areas. Finally, the role played by trust in PSS providers during adoption is highlighted.

2.3.1 Theoretical Approaches in PSS Research

The majority of research on consumers and PSS diffusion has not made explicit use of theory. Three theories have been proposed as lenses through which to structure enquiries and explain consumer acceptance of PSS: activity theory (AT) (Rexfelt & Hiort af Ornäs, 2009), practice theory (PT) (Mylan, 2015; Sousa-Zomer et al., 2016), and consumer culture theory (CCT) (Catulli et al., 2017; Mylan, 2015; Santamaria et al., 2016).

AT proposes that consumers use products during activities aimed at fulfilling their needs, which in turn tie into grander motives. Rexfelt and Hiort af Ornäs (2009) discuss a variety of hypothetical PSS with consumers and then apply AT to develop the system illustrated in Figure 2-3.

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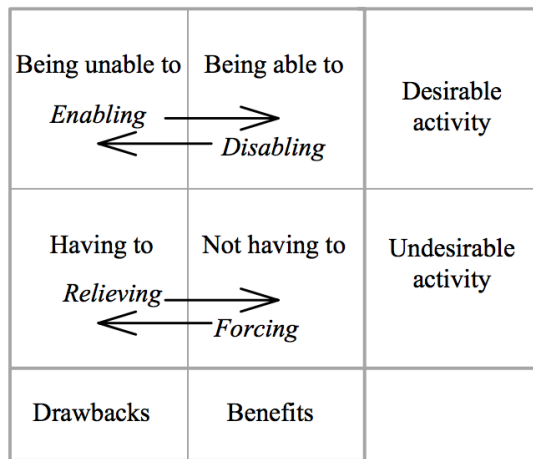


Figure 2-3: The AT perspective on PSS (Rexfelt & Hiort af Ornäs, 2009, p. 680).

According to AT, PSS are catalysts that enable consumers to engage in new desirable activities and relieve them from previously necessary but undesirable activities. However, PSS may also force new undesirable activities upon them and prevent them from engaging in previously desirable activities. For example, a lack of ownership may free individuals from associated costs and responsibilities but may place new responsibilities on them, as they have to care for used but not owned products.

The core proposition of AT overlaps significantly with PT, which remains the dominant theoretical underpinning of PSS consumer research (Catulli et al., 2017).

Mylan's (2015) and Sousa-Zomer et al.'s (2016) PT perspective argues that consumers engage in practices that are dynamic entities in their own right, which are recreated continuously through 'doings'. In PT, 'people mostly consume without registering or reflecting on what they are doing because they are, from their point of view, actually doing things like driving, eating, or playing' (Warde, 2005, p150) and 'the practice itself (what people do, how they do it and what this does) becomes the focus of analysis, shifting attention away from moments of individual decision-making' (Mylan, 2015, p14). These practices, composed of materials, competencies and meaning elements, are often connected to a lesser or greater degree with other practices (Shove et al., 2012).

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It is proposed that the more mechanistic early focus on prices and a more abstract utility does not fully explain the lack of success of PSS despite the initial optimism (e.g., Mont, 2002), as the use-phase of PSS has been neglected. Mylan (2015) shows how unintuitive and unforeseen societal dynamics can charge practices with new meanings that are conducive or hostile to PSS diffusion. As practices only partially evolve around the material element with which they are performed, designing and providing PSS to meet consumer needs is argued as being erroneous. The assumption that needs are stable would imply the need to substitute the material element that has an organic relationship with the competence and meaning elements of the practice with an alternative that has no such relationship. This would then lead to a clash and the consumer's perception that the PSS is inferior to conventional products in that it lacks fit with the practice. It has been proposed instead that PSS themselves should be deliberately designed to transform needs, as they will struggle to replace existing material elements in existing practices (Santamaria et al., 2018).

An example of this is the failure of laundry PSS, which espoused the practice of washing at lower temperatures. The failure is explained by arguing that the practice of washing at high temperatures is tightly coupled with cultural meanings of cleanliness that transcend the functional need for clean clothes (Mylan, 2015). In this case, the environmentally motivated idea of washing at lower temperatures, an integral part of the proposed PSS, clashes with the cultural meaning of cleanliness that is connected to washing at high temperatures. Sousa-Zomer et al. (2016) argues from a similar perspective. PSS use would often disrupt existing practices, and if these practices are culturally charged with meaning in a deep socio-psychological context, this disruption is further compounded. Such disruptions may significantly compromise expected functional and symbolic values, although considerations of value and identity are more dominant in the last theoretical perspective (Hobson et al., 2018).

This last theoretical perspective was proposed by Catulli et al. (2017), who critique the use of PT for its disregard of consumers' agency in the creation and enactment of practices (Whitmarsh et al., 2011), and propose CCT as an alternative approach. While Mylan (2015) also mentions CCT, Catulli et al. (2017) commit more fully to its application, as it retains the focus on 'doings' dominant in PT but adopts the

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perspective of ‘dynamic relationships between consumer actions, the marketplace and cultural meanings’ (Arnould & Thompson, 2005, p. 868).

This perspective, therefore, looks less how established practices emerge and interact with their elements and other practices on the macro-level, and more at how the individual achieves goals through consumption actions, which relate to functional/utilitarian or symbolic/meaningful values. Catulli et al. (2017) focus on use-oriented PSS and argue that short-term access, as opposed to long-term access or ownership, alters the object-self relationship significantly, with the result that different value is extracted from the PSS. As freedom and control are conceded and responsibilities change, the boundaries between oneself, the product, and other users of the PSS become blurred, which appears to threaten identity and sense of self. It may, therefore, be argued that Catulli et al.’s (2017) use of CCT engages with symbolic self-completion theory which stipulates that ‘people use material possessions and other indicators to communicate aspects of the self, particularly when they feel insecure in such aspects’ (Dommer & Swaminathan, 2013, p. 1036). As this possession is not given, consumers must adjust and likely extract different (and often lesser) functional and symbolic values from the PSS. Catulli et al. (2017) develop five themes related to this perspective in their study on PSS acceptance:

- Partial identification of consumers with items because of a lack of ownership prevents some actions and necessitates others.
- The change in expected functional and symbolic value creates unforeseen dynamics and trade-offs—symbolic values are more diverse and difficult to grasp without first-hand use knowledge of the PSS.
- Brand assurance and quality are questioned in cases of used products, compounding uncertainty about expected value.
- A closer relationship with a company and its other customers is created (in this case deliberately mediated by the company), which means that other parties join the consumption process.
- Perceptions of risk and trust impact on all other themes.

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The findings achieved through the perspectives of AT, PT, and CCT are mostly complimentary. Scholars propose that PSS acceptance hinges on the changes that occur in consumers' activities, doings, or actions, depending on which theoretical lens is adopted, when using a PSS in place of a conventional alternative. However, the application of these theories has also created a problem that is explained below by highlighting the distinction between adoption and acceptance of PSS.

Vezzoli et al. (2015, p. 6), in a review of the literature, state that unfortunately 'relatively few radical [PSS] examples currently exist and therefore, user acceptance remains a black box'. In this context, 'radical' PSS describe offerings that require users to change existing habits significantly as they go beyond incremental or optional service add-ons. In light of this challenge, studies such as those by Rexfelt and Hiort af Ornäs (2009), Sousa-Zomer et al. (2016), or Catulli et al. (2017) examine hypothetical PSS, with which consumers have no use experience, and discuss them with consumers. Thus, they encourage consumers to hypothesise about which factors would be important during use.

However, the characteristics of PSS that are important during their use may not be those that are important during purchase. Poppelaars et al. (2018, pp. 2–3) demonstrate this both theoretically and empirically using the Consumer Decision model (or Engel-Blackwell-Miniard (EBM) model), which they claim to be 'one of the most widely cited models... it attempts to provide a framework of the key elements that are claimed to explain the behavior of consumers'. Poppelaars et al. (2018) use the model to structure the reasons proposed by consumers for and against the adoption and acceptance of car-leasing and phone-leasing/upgrade PSS. The model is shown in Figure 2-4.

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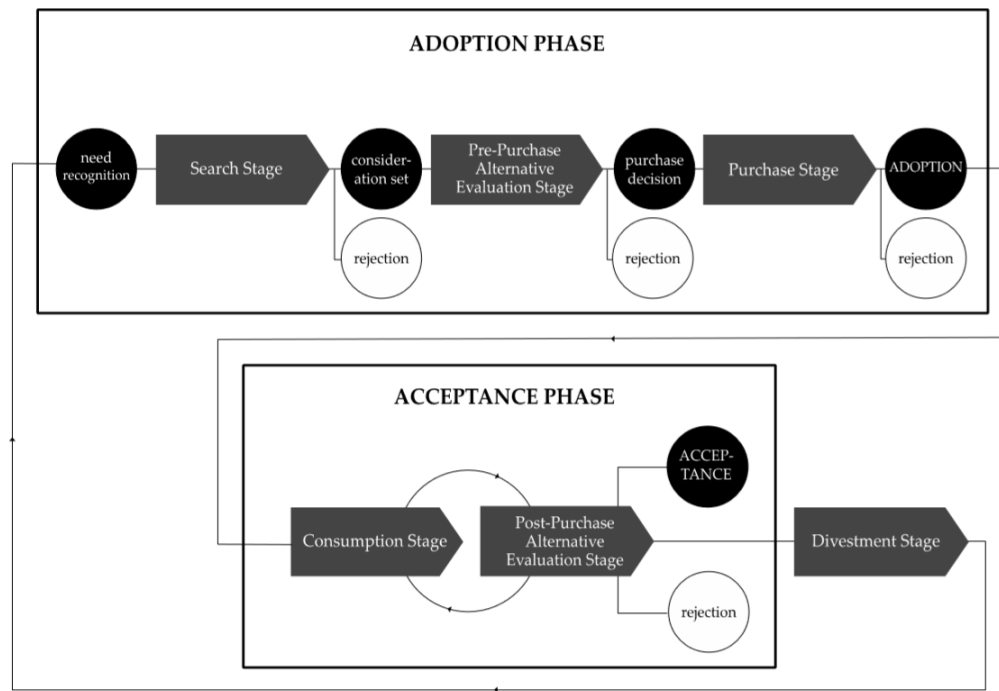


Figure 2-4: The Consumer Decision model (Poppelaars et al. 2018, p. 3).

The main contribution of this model's introduction to the PSS debate is the visualisation of the difference between consumer adoption and acceptance, which refer to two separate stages. These are the pre- and post-purchase stages, as shown in Figure 2-4. Adoption includes identification, evaluation, and the decision to buy and begin using an unfamiliar product, while acceptance refers to the option to continue use after the product is compared with alternatives. Poppelaars et al. (2018), in a study of car- and phone-access, demonstrate that different factors are important at varying phases during these two stages (see Figures 2-5 and 2-6). As consumers experience these phases, it appears that the number of relevant factors steadily decreases until a decision must be made between adoption or rejection, and, at a later date, between acceptance or rejection.

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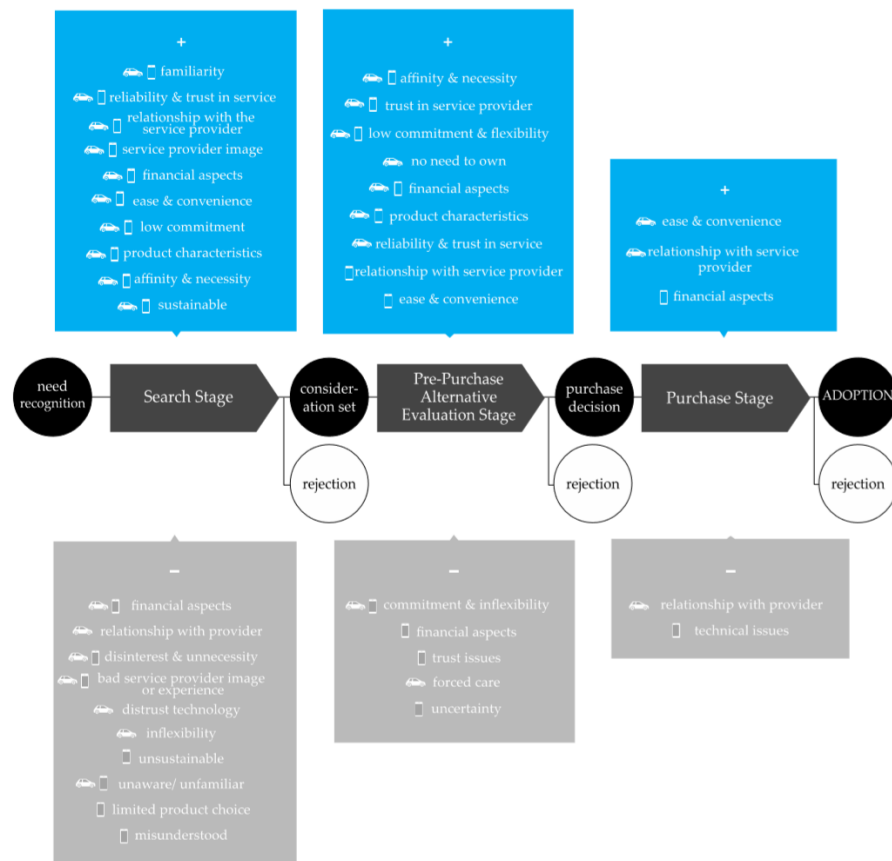


Figure 2-5: Relevant factors during adoption of two different PSS (Poppelaars et al. 2018, p. 8).

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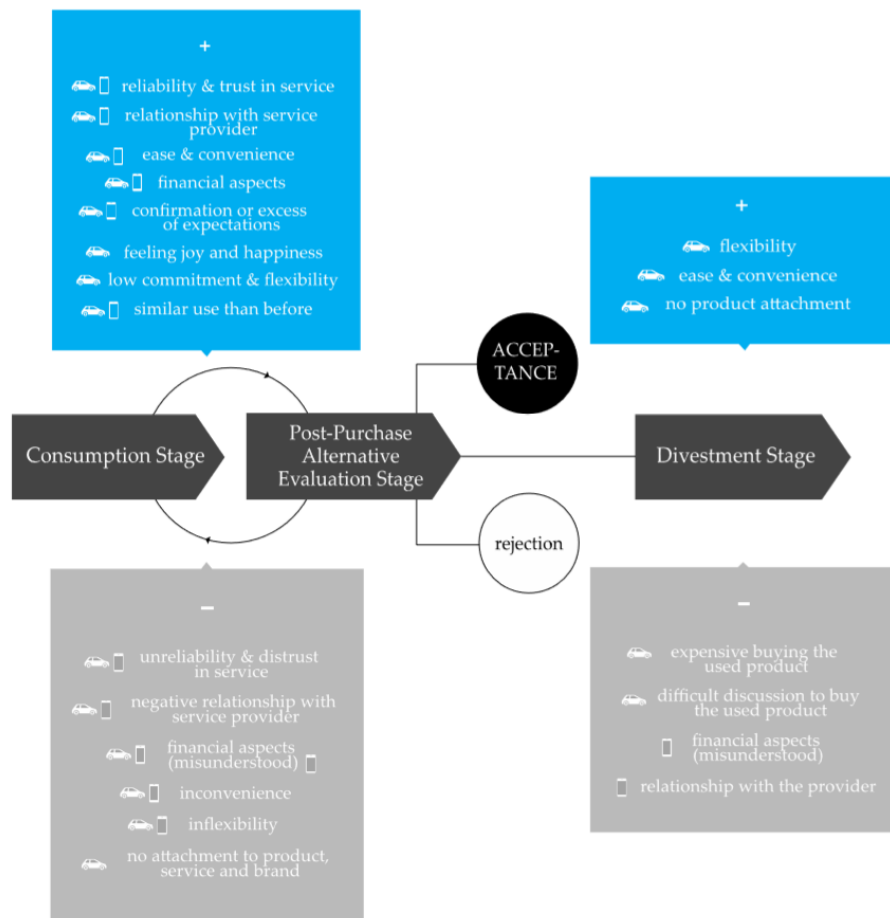


Figure 2-6: Relevant factors during acceptance of two different PSS (Poppelaars et al. 2018, p. 8).

This distinction, which has been lacking in previous studies and theoretical approaches, presents a stimulating challenge to prior findings.

Rexfelt and Hiort af Ornäs (2009) claim to study acceptance in their paper titled ‘Consumer acceptance of product-service systems’. However, they discuss a hypothetical PSS, and so respondents cannot make claims about their reasons for acceptance, only about their reasons for adoption. This is not explicitly acknowledged by Rexfelt and Hiort af Ornäs (2009), but is evident in the main output of their paper, which is shown in Figure 2-7. They propose a process framework in which consumers must first understand the offer, predict the consequences that will result from its adoption, predict whether these consequences match their needs, and then make a

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choice based on attractiveness and associated risks. This framework is an adoption model adapted to the PSS context that includes uncertainties generated by a distrust of the PSS provider and a lack of knowledge about what the PSS actually delivers. As such, Rexfelt and Hiort af Ornäs (2009) must be assumed to study adoption rather than acceptance in practice. This is problematic, because the application of AT would be more appropriate when consumers have experience with using the PSS, as they can then make more valid statements about which activities PSS use enables or prevents.

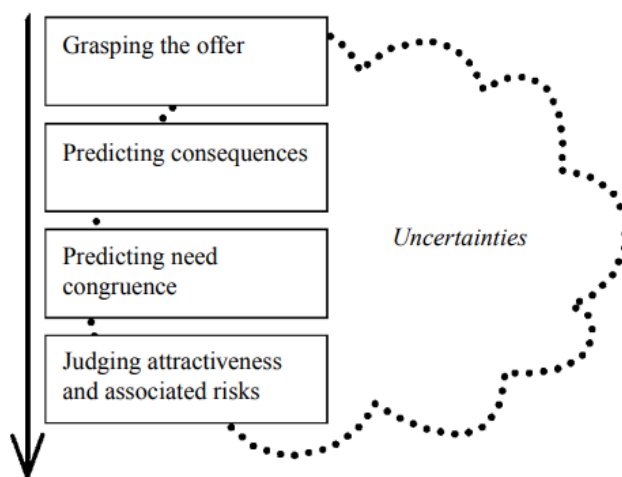


Figure 2-7: Consumer uncertainties when confronted with a PSS (Rexfelt & Hiort af Ornäs, 2009, p. 688)

Mylan's (2015) study does not suffer from this disconnect between what is portrayed as studied and what is actually studied, as she examines past successful or unsuccessful PSS cases that allow her to draw conclusions about acceptance.

However, Catulli et al. (2017), Catulli and Reed (2017) or Sousa-Zomer et al. (2016) follow a similar logic to Rexfelt and Hiort af Ornäs (2009) in their use of hypothetical PSS cases. AT, PT and CCT focus very much on 'doings' which can only be fully judged based on use experience, which is consistent with the application of PT and CCT in marketing and consumer research literature (e.g., Arnould & Thompson, 2005; Echeverri & Skålén, 2011). Yet, in these studies, authors ask consumers to predict

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changes in their ‘doings’ based on brief descriptions of hypothetical PSS and subsequent reflection during interviews or group discussions. It is then assumed that these predicted changes in ‘doings’ during acceptance are also the reasons for or against adoption. However, this argument is theoretically flawed, as Rexfelt, and Hiort af Ornäs (2009) themselves admit that consumers are not fully able to predict what changes in ‘doings’ their adoption of the PSS will entail. Although there may be overlap, the assumption that factors at play during both stages are similar is therefore false, as Poppelaars et al.’s (2018) study demonstrates empirically.

In summary:

- a) Consumers were asked to provide reasons for or against acceptance of a PSS with which they had no use experience (e.g., Armstrong et al., 2015; Catulli & Reed, 2017; Catulli et al., 2017; Rexfelt & Hiort af Ornäs, 2009).
- b) While these studies’ findings were analysed using theories fitting with acceptance, these findings are actually conjectured reasons for or against adoption.
- c) Consumers cannot comment on reasons relevant to acceptance prior to adoption, as giving relevant reasons for or against acceptance requires use experience (Mylan, 2015; Poppelaars et al., 2018).
- d) There is more knowledge available to explain PSS adoption than acceptance, as studies on actual acceptance are even sparser than is apparent at first glance, and virtually all knowledge pertains to adoption with few exceptions (e.g., Mylan, 2015; Retamal, 2017).
- e) There is a lack of theory suitable for predicting adoption instead of explaining and interpreting the reasons relevant to adoption, as the importance of simple factors, such as prices, are difficult to evaluate (Tukker, 2015).

The reason for these disconnects is uncertain. The fact that PSS research emerged out of an engineering tradition less familiar with consumer decision-making theories may be partially responsible (Park et al., 2012), which is also apparent in the influential papers on the topic by Mont (2002) or Tukker (2004). There may also be an implicit assumption among some more optimistic authors that the consumer can predict the

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sum of all changes resulting from a PSS prior to using it. In this case, all PSS that are bought would also be continually used, as there are no unknowns and the ‘otherness’ of PSS has already been internalised. There is, however, no basis for this assumption, which constitutes the need to enrich the PSS literature with a theory more suited to predicting adoption.

2.3.2 Significant Change Dimensions in PSS Adoption

Regardless of whether or not studies utilised one of the previously described theories, research has converged on three broad areas that tend to occupy consumers’ minds when confronted with PSS: a lack of newness, a lack of ownership, and a lack of choice, which are ‘change dimensions’, as they deviate significantly from the current consumption paradigm based on choosing and buying new products.

Here, it is acknowledged that, for some consumer groups or product categories, there are already established alternatives to consumption based on newness, ownership, and choice. Piscicelli et al. (2015) offer the example of a C2C sharing community with distinct value systems; Catulli and Reed (2017) similarly show that there are alternative options for acquiring products with high value and limited use periods and frequency in some product categories.

For such consumers and product categories, the change dimensions of PSS will be fewer or less significant and will often only include the formalisation of the process and payment. As such, even if the dominant market logic has established certain attitudes among most consumers, there appear to be consumers that follow alternative logics although, admittedly, this appears to be rare overall or specific to niche products (Hirschl et al., 2003). As such, ‘consumers in certain parts of the world are more likely to accept PSS... consideration of the cultural conditions is necessary for PSS, and a company should first verify that the correct conditions appear to be in place’ (Beuren et al., 2013, p. 225).

Overall, it may be said that the following change dimensions apply to the majority of consumers and PSS cases and require conscious engagement to reconcile.

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Lack of Newness

While neither product-, use-, nor result-oriented PSS are necessarily pre-used when offered to the consumer, this is often the case when there are environmental benefits to be achieved. There are exceptions, and product-oriented PSS in particular are, in some cases, simply products that are sold with extended repair services and subsequent free take-back systems (Vogtländer et al., 2002). Similarly, in the area of use-oriented and result-oriented solar systems PSS, the product component is typically new and leased to the consumer on a contractual basis (Shih & Chou, 2011) or provided as part of a functional result in offering access to electricity at a pre-determined price (Manzini & Vezzoli, 2003). In both cases, it may be hypothesised that the provider will later refurbish and sell the product components, but, during their initial lives, the products are new.

However, in the majority of researched PSS cases, products are not new, as they are either owned or rented long-term after having been used by someone else, as indicated above, or are shared more flexibly between several users, as is common in car-sharing schemes (Chian Tan et al., 2017; Garrett et al., 2017). There are several advantages and disadvantages resulting from a lack of newness from the consumer's perspective.

First, consumers are aware that access to used products, regardless of whether this includes exclusive ownership rights or merely temporary access, is likely to be cheaper than ownership of or access to a new product (Mont, 2002). This may align with attitudes about being a 'smart consumer' and saving money through conscious consumption choices, which can bring satisfaction in its own right (Tu et al., 2013); consumers realise that many product categories are functionally viable after having met one individual's needs. This is especially relevant in product categories that are perceived as highly utilitarian, meaning that newness is only important when prior ownership is seen to compromise the functionality of the PSS, and not for symbolic or emotional reasons (Hannon et al., 2015). It may also enable consumers to access products that would be prohibitively expensive when bought new (Catulli et al., 2017), or may simply allow consumers to buy more items overall (Retamal, 2017). Some consumers are also interested in using items that have a use history for emotional

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reasons, which several companies capitalise on: ‘scars tell stories’ (Chamberlin & Boks, 2018).

Overall, however, it is clear that, all things being equal, consumers prefer newness (Kang & Wimmer, 2008). There are social stigmas to buying used products, particularly among consumers who see products as instrumental to identity construction (Hirschl et al., 2003) and there appear to be few consumers whose attitudes and previous experiences result in an interpretation free from negative stigma (Piscicelli et al., 2015).

For such consumers, used products are simply inferior options only to be bought if the monetary savings are exceptional and their needs are highly functional. This may be because the purchase or use of pre-used products is perceived as indicative of their belonging to an economically disadvantaged class (Catulli & Reed, 2017), but more severe than these associations are frequent concerns about the performance of used products.

Consumers experience concern regarding whether used products will actually perform their intended function and for how long, because of anticipated technological or stylistic obsolescence, or simply because they are believed to be sold in poor condition (Kang & Wimmer, 2008).

Uncertainties about performance can take numerous forms: consumers may be unsure about the safety of products, for example, in the context of mobility services (Cherry & Pidgeon, 2018). Several studies on products that include textiles or that come into contact with skin show that consumers are concerned about cleanliness and hygiene (e.g., Armstrong et al., 2015), which are connected to perceptions of contamination or feelings of disgust (Chamberlin & Boks, 2018). Such worries resonate with previously described stigmas, and are particularly severe when connected to meaningful contexts, for example, when products are intended for use by children or infants (Catulli & Reed, 2017; Retamal, 2017). Here, the newness of parenthood is not to be compromised by pre-used products, which ties into the PT and CCT perspective proposed by researchers.

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Lack of Ownership

Lack of ownership is the most frequently researched change dimension of PSS, because use-oriented PSS are common in research and practice. Lack of ownership is an integral feature of use-oriented PSS, although result-oriented PSS also frequently imply that the ownership of products remains with the provider (Bressanelli et al., 2018).

There are two standpoints on this topic, both of which appear to be correct under the right conditions: ‘temporary needs and wishes can be fulfilled by temporary use...instead of owning the product. Users can be liberated from the burden of owning’ (Kang & Wimmer, 2008, p. 1149) versus ‘the main barrier to the adoption of a PSS [is] the cultural shift necessary for a consumer to place value on having a need met as opposed to owning a product’ (Baines et al., 2007, p. 7), because ‘consumers simply value owning things and having control’ (Tukker, 2015, p. 88).

Regarding the first statement, there are often benefits to not owning products and consumers readily identify these. Ownership may be seen as a burden because it places responsibilities on the owner during acquisition (e.g., permits, transport, installation), use (e.g., repair, maintenance, upgrade), and disposal (e.g., sale, return).

These responsibilities cost resources and often commit consumers to a shared future with the product as entry barriers are resource-intensive—in the case of car-sharing schemes, this is the management of insurance, MOT, parking, and so on (Chian Tan et al., 2017). In other cases, the avoidance of clutter and commitments may be a major motive in rejecting ownership (Catulli, 2012). Consumers value having flexibility and the ability to shift their expenses quickly, as they are aware that their needs may change, necessitating different products (Hirschl et al., 2003). Use-oriented PSS offer this flexibility, especially when contract agreements are short (Shih & Chou, 2011).

When such flexibility is desired, consumers may actively seek out PSS-like solutions; an interviewee of Catulli et al. (2017, p7) expresses that ‘...I really didn’t want to put a lot of money in this car seat, so I was thinking hard, I mean, there must be a solution to this, I don’t want to buy one.’

This desire to avoid significant out-of-pocket expenses is strongest when consumers recognise that the desired length of use is not equivalent to the product’s total potential

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lifecycle, and there is antipathy among some consumers towards ‘wasting’ the remaining utility bound in a product by disposing of it prematurely. In such cases, consumers might also realise the environmental benefits of letting one product serve the needs of multiple users over different use periods (Armstrong et al., 2015). There are, however, also examples wherein the realised cost savings are promptly reinvested to increase consumption levels (Retamal, 2017).

Apart from cost and environmental savings, convenience during acquisition, use, and disposal, it is also found that the ownership-less consumption can enable ‘more meaningful experiences’ between users of PSS (Piscicelli et al., 2015, p. 2) and offer more social interaction (Armstrong & Lang, 2013). However, this appears to be the case only when users can communicate or strongly empathise with one another (Park & Armstrong, 2017), which is most often the case in sharing communities. In such instances, PSS may ‘provide the experiential benefits of temporary ownership of goods but without the burden of actually owning them’ (Chian Tan et al., 2017, p. 265).

While these reasons for use-oriented PSS diffusion are largely user-driven, providers have developed use-oriented PSS as vehicles to foster adoption of innovative technologies. Leasing or renting solar power systems (Shih & Chou, 2011), or buying functional energy results (Manzini & Vezzoli, 2003) can aid providers in balancing technological obsolescence risks between themselves and consumers. A similar benefit is reported in the case of the renting and sharing of electric vehicles, which removes the risk of technological obsolescence in the battery from the consumers’ experience (Cherubini et al., 2015).

Overall, use-oriented PSS seem to be most attractive to consumers in cases where products are required for brief, intense use periods, as in the case of urban transport and car-sharing, or longer but definitely limited periods, as in the case of car seats for infants (Catulli et al., 2017). Regarding consumer characteristics, Hirschl et al. (2003) claim that income, education, and age are predictors here. In particular, an ‘open-minded’ consumer group, with higher levels of education, average income, and below average age, fits with ownership-less consumption. This is largely corroborated by Chian Tan et al. (2017) and Piscicelli et al. (2015), who also assert that less risk-averse consumers fit better with ownership-less consumption. A new consumer type, who is money-savvy, opportunistically interested in the environment social belonging, highly

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consumerist in a sense that new products and experiences are desired, but not attached material possession (Cherubini et al., 2015), appears to be emerging.

Meanwhile, there is also an ‘ownership-oriented’ consumer type, for whom material possession contributes more to their identity and self-worth (Hirschl et al., 2003). For these consumers, renting or sharing product categories that have historically been exclusively owned carries a social stigma. This stigma may be associated with society’s economically or socially disadvantaged strata (Catulli et al., 2017) who, without the option of renting to smooth out costs, could not access certain products at all (Retamal, 2017). For such consumers, the symbolic value of ownership is more important than for others (Halme et al., 2004) and the ‘sweetness of owning’ cannot be fully replaced by temporary access (Armstrong et al., 2015). This mirrors the endowment effect of behavioural economics—consumers value ownership in and of itself (Kahneman et al., 1991).

Beyond the importance of ownership for the sense of self, another major drawback of ownership-less consumption relates to the changed relationship between consumer and provider in use-oriented PSS (Cherry & Pidgeon, 2018). Responsibility for the product during its use rests on the user, and consumers worry about whether they will have to pay for damage done to the products (Catulli et al., 2017) although, in practice, this does not necessarily ensure careful use (Retamal, 2017). Cherry and Pidgeon (2018) argue that this dependence on the provider to show leniency in enforcing penalties for damage and the uncertainty that it creates are uncomfortable for consumers. Tietze et al. (2015), using a property rights theory lens, find that this worry may prevent users from utilising the product how they would want to under normal circumstances, for example by customising it or using it differently from how the provider intended it. It is clear that consumers perceive a loss of freedom and independence here and that another party has entered the picture (Sousa-Zomer et al., 2016).

Based on Friebe et al. (2017), there is also concern as to whether the promise of reliable, convenient provision at a lower cost will actually materialise, because of the unknowns pertaining what specific responsibilities they carry as users, or how exactly the PSS will be delivered. A critical factor in the adoption of shared washing machines, for example, is the distance between user and product, which overrides otherwise

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attractive benefits if it impedes normal use-regimes of walking to the washing machine in a certain amount of time (Bressanelli et al., 2017).

Whether or not a use-oriented PSS meets consumer needs depends not only on the skills and trustworthiness of the PSS provider, who through opportunistic behaviour could turn the longer term leasing contracts into a poor commitment that cannot be rectified quickly (Hannon et al., 2015; Rexfelt & Hiort af Ornäs, 2009), but also depends on factors that are beyond the control of either the consumer or the provider of the PSS—for example, technological obsolescence, fluctuating energy prices, or subsidies and taxes in the case of solar power system leasing (Shih & Chou, 2011).

From the provider's perspective, this may appear puzzling: an employee of a provider states that 'it's hard to sell a no-brainer' (Överholm, 2017, p. 293). Ultimately, the distribution of risk for payment, maintenance, etc. is a significant issue, as providers state that to 'to create a sense of responsibility at the consumer side, down payments are absolutely necessary' (Friebe et al., 2013, p. 765).

Lack of Choice

Lack of choice is an issue that is almost exclusive to result-oriented PSS. There are some use-oriented PSS, such as car-sharing services, in which the consumer may not know the specific model of the nearest available car prior to seeing it (Chian Tan et al., 2017), and this may be an issue for consumers who are not highly utilitarian in their expectations (Cherubini et al., 2015). Similarly, there are result-oriented PSS that allow the consumer to set narrow expectations on which products are expected from the provider, largely negating the uncertainty of a lack of final choice (Cherry & Pidgeon, 2018).

As originally intended, however, the more radical and environmentally friendly result-oriented PSS give the provider greater freedom to design or choose a product that fits the consumer's needs. There are few existing examples of this when it comes to physical goods—bespoke or customised products are rare and usually only thrive at the premium end of a market (Tietze et al., 2013). As such, result-oriented PSS are rare in consumer contexts (Tukker, 2015).

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This is unfortunate, as result-oriented PSS are at the heart of the research area, which recalls Mont's (2002, p. 238) statement that 'more traditional material intensive ways of product utilisation are replaced by the possibility to fulfil consumers' needs through the provision of more dematerialised services.' Contrary to conventional consumption contexts, in which the consumer chooses a product based on a reflection of his own needs, in result-oriented PSS the provider selects a product based on their understanding of the consumer's needs and their in-depth knowledge and skill-set.

This is not unproblematic, as empirical studies show that it is difficult for consumers to voice their needs exhaustively and that needs evolve as PSS are considered in detail (Armstrong et al., 2015; Rexfelt & Hiort af Ornäs, 2009). This resonates with Mylan's (2015) argument on practice theory, and it may be argued that it will always be difficult for a company to sufficiently understand the entire spectrum and complexity of consumer needs (Santamaria et al., 2016). For example, consumers have a need for cheap transportation; a result-oriented PSS that only meets this need while disregarding the implicitly essential and more nuanced needs for status and flexibility is unlikely to be successful with many consumer groups (Chian Tan et al., 2017).

Consumers may therefore be uncertain as to whether a PSS provider is able and willing to elicit and recognise all needs, structure and order them sensibly, and provide a PSS that will meet them reliably (Armstrong et al., 2015; Hannon et al., 2015). This aligns with the division of service quality into six dimensions by Schneider and White (2004). These dimensions pertain to the professionalism and skills, attitudes and behaviour, accessibility and flexibility, reliability and trustworthiness, recovery willingness, and reputation and credibility that consumers perceive in a service provider and their products. Consumers are especially apprehensive about being 'scammed' (Rexfelt & Hiort af Ornäs, 2009), as a PSS provider may be envisioned as just meeting minimum contractual obligations while disregarding implicit expectations. As the consumer-provider relationship in such cases is closer, as relationship-specific knowledge has been created and result-oriented PSS tend to be delivered through long-term contracts, such worries are compounded (Cherry & Pidgeon, 2018). From another angle, it may be argued that the choice in itself is desirable for consumers, because these choices reflect goals related to identity and self (Catulli et al., 2017). However, research also

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shows that this is only the case when goals are hedonic—utilitarian goals may be more satisfactorily achieved when choices are made by experts (Botti & McGill, 2010).

It is clear here that the impetus is placed squarely on PSS providers, as consumers have found ways to meet their needs within the context of the current consumption paradigm, which means that result-oriented PSS must be superior in some way to be considered. Contrary to Mylan (2015), it appears that even in established practices some result-oriented PSS have gained purchase, as well as in the similar context of washing and hygiene (Bressanelli et al., 2018). Cost and environmental advantages have been cited in some settings, as consumers realise that the provider may be able to choose a more fitting and efficient product than the consumer, due to their greater technical knowledge (Bocken et al., 2018; Överholm, 2015). In other cases, the provider may actually be better able to recognise and fulfil more individualistic needs than the consumer, for example, in fashion consulting services (Armstrong et al., 2015). Another pull may be the convenience and guaranteed access, as the provider bears full responsibility for providing the result, repair, and maintenance services that are included (Tukker, 2015). As such, the appeals of result-oriented PSS remain fairly utilitarian and it is unclear what their relationship is to the factors extracted from research on use-oriented PSS that rests on a richer empirical base.

Assessing the Importance of the Change Dimensions

These findings on the three major change dimensions have been acquired mainly from a series of explorative qualitative studies. Such studies have usually compared different product-, use-, and result-oriented PSS against each other or conventional alternatives (e.g., Armstrong et al., 2015, 2016; Catulli, 2012; Catulli & Reed, 2017; Catulli et al., 2017; Cherry & Pidgeon, 2018; Hobson et al., 2018; Mont et al., 2006; Poppelaars et al., 2018; Retamal, 2017; Rexfelt & Hiort af Ornäs, 2009). These studies have enriched the field beyond the more general assumptions initially offered by Mont (2002) and others, but this breadth has also caused a lack of depth. The actual importance of the given reasons for and against adoption, especially in cases

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combining product-, use-, and result-oriented PSS characteristics, remains unknown (Tukker, 2015).

2.3.3 The Role of Information and Trust

As has been shown, uncertainties about PSS are at the forefront of consumer thinking (Catulli, 2012). Worries persist both about potential advantages and potential drawbacks of PSS, as consumers do not know what to expect from adoption, which makes adoption unlikely. As such, it is claimed that ‘customers have a lack of knowledge and understanding about [PSS]...this generates uncertainties related to unclear risks, costs and responsibilities’ (Vezzoli et al., 2015, p3).

Consumers make choices based on information, which in the marketplace may be imparted by several means. In marketing research, multiple areas have opened up the ways in which such information may be communicated to consumers to influence their decision-making via different communicative devices, media, or advertising methods (e.g., Cheong & Morrison, 2013) and the role that a trustworthy brand plays in this (e.g., Pan & Chiou, 2011).

In the area of PSS, there are few studies examining how PSS and relevant product information should be communicated to consumers, despite earlier calls for such research (Catulli, 2012); Boks and Chamberlin (2018) as an exception give an overview of PSS providers’ tendency to design their communication strategies to address different consumer concerns (see Table 2-2).

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Consumer Factor	Communication Design Strategies
Contamination/disgust/newness	Importance, playfulness, rephrasing and renaming, emotional engagement, empathy, personality, framing, choice editing
Convenience/availability	Encouragement, direction, simplicity, assuaging guilt, worry resolution
Ownership	Meaning, anchoring
Cost/financial incentive/tangible value	Encouragement, rewards, importance, first one free, scarcity, framing
Environmental impact	Transparency, simplicity, empathy, obtrusiveness, meaning, framing, emotional engagement, importance, assuaging guilt, direction
Brand image/design/intangible value	Meaning, storytelling, empathy, mood, color associations, importance, emotional engagement, scarcity, prominence, obtrusiveness, expert choice, social proof.
Quality/performance	provoke empathy, meaning, storytelling, personality, importance, scarcity, expert choice, direction, emotional engagement, worry resolution
Customer service/supportive relationships	Encouragement, tailoring, transparency, emotional engagement, metaphors, provoke empathy, assuage guilt, reciprocity, importance
Warranty	reciprocation, assuaging guilt, worry resolution, obtrusiveness, metaphor, importance
Peer testimonials/reviews	social proof, storytelling, provoke empathy, expert choice, importance, worry resolution

Table 2-2: Communication design strategies used to market PSS (Chamberlin & Boks, 2018, p. 9).

In research on PSS adoption, respondents typically receive an explanation of the working of the real or fictional PSS. This explanation is given at the business model level and without reference to the exact physical product artefact, focusing instead on the relationship between provider and user as defined through rights, responsibilities, and liabilities. In research, various tools are used to introduce PSS to consumers, which may be consumer stories (Armstrong et al., 2015; Rexfelt & Hiort af Ornäs, 2009), vignettes (Cherry & Pidgeon, 2018), or simple descriptions (Poppelaars et al., 2018). These are sometimes aided by visualisations of the value delivery network to show the consumer's place in the service relationship (see Figure 2-8).

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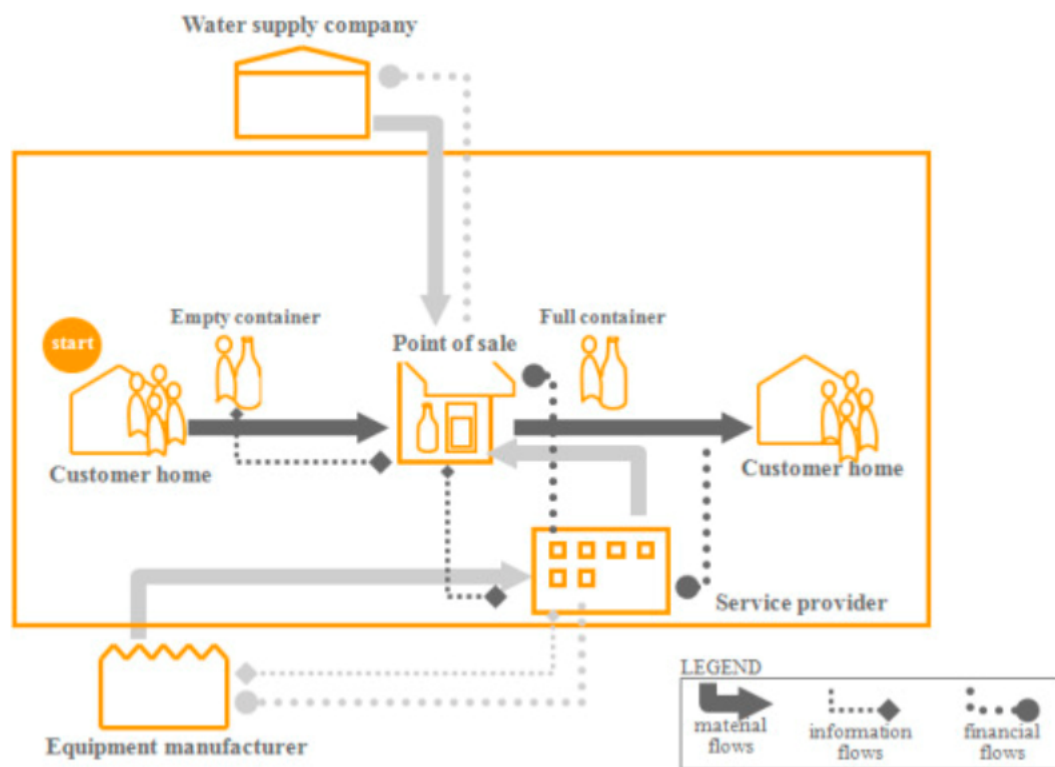


Figure 2-8: Example of a visualisation of a PSS delivery network (Sousa-Zomer et al., 2016, p. 77).

In these studies, the information given to participants has been held constant—i.e., all participants have received the same product information. In some cases, researchers have asked respondents to discuss multiple, but fundamentally different PSS. However, the cognitive understanding of a PSS appears to be difficult for consumers, which is claimed to be a barrier to successful adoption (Mazini et al., 2003). Poppelaars et al. (2018) and Armstrong et al. (2015) find that there may already be significant misunderstandings at the stage of understanding the PSS. This is particularly acute when the PSS is complex and delivered by networks instead of single providers (Hannon et al., 2015). It may be argued that more educated consumers would find this cognitive process easier (e.g. Armstrong et al., 2015; Mont, 2006), but Sousa-Zomer et al.'s (2016) full visualisation of a PSS in Figure 2-10 shows that the workings of such offers are not necessarily simple. As such, providing information about the PSS

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is vital for consumer adoption, but the effects of how such information is communicated have not been researched hitherto.

This is connected to a theme that has emerged as critical but ill-defined in research on consumer adoption. Scholars agree on the importance of trust in alleviating uncertainty, but there may be several different types of trust at work. Chian Tan et al. (2017), for example, observe that, in the case of car-sharing PSS, ‘trust in the commons’ must be established—i.e., the idea that co-users will generally act in the interest of co-users. A similar idea is apparent in Piscicelli et al. (2015)—when users of a PSS that includes elements of cycling or sharing are inclined to trust other users, adoption becomes more likely. Following Plepys et al. (2015) or Shih and Chou (2011), there can also be trust in a regulatory environment that supports PSS through investment in infrastructure, subsidies, or technology that make PSS competitive where they would not be under free-market circumstances. Similarly, there is a trust aspect in an evolving consumer culture: consumers may be concerned as to whether car-sharing is culturally acceptable when car-renting or -leasing is already established and accepted (Alfian et al., 2014).

However, while it is acknowledged that ‘individual market players may find it difficult to change the logic of established markets’ (Plepys et al., 2015, p4), from the consumer’s perspective a trustworthy PSS provider appears to be the most crucial element, as agreed on in the vast majority of studies conducted among consumers. While other streams of literature have worked extensively on trust (e.g., Koufaris & Hampton-Sousa, 2002), the differentiated dimensions of trust in PSS literature are largely absent. Trust relates to the expectation that implicit or explicit commitments by another party, which cannot be fully controlled, will be met (Rotter, 1971). Trust is, therefore, important in areas of uncertainty where social actors have an interest in reducing complexity and increasing predictability (Gefen, 2002).

Given the complexity of PSS and consumers’ lack of familiarity with such offers, it is proposed that a high degree of trust in the provider may function in two interconnected ways: a) by assuring consumers that the provider is able and willing to act in their interest, and b) by increasing consumers’ confidence in the information provided by the provider about the PSS.

The first point reflects consumers’ awareness that, due to opportunistic behaviour or a genuine lack of skills and resources, a provider may fail to deliver on the assumed

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advantages of PSS adoption and instead make real the various fears and worries consumers have (Rexfelt & Hiort af Ornäs, 2009). A trustworthy provider would be assumed to possess the necessary skills and resources, as well as the willingness to deploy them in a way that meets the consumer's expectations. As such, it is implicitly assumed in much of the literature that a trusted provider can assure consumers with regard to their positive expectations and alleviate the threat of negative expectations (e.g. Catulli et al., 2017).

At the stage of adoption, it is proposed that this trust reflects the PSS product information that is provided to consumers. As consumers do not possess first-hand experience of the PSS and cannot depend on word-of-mouth, certifications, and other potentially reliable sources of reference, information about the PSS given by its provider becomes critical. As the service element is difficult to specify, to the point where there would be no unknowns about the PSS, trust becomes critical in assuring the consumer that uncertainty in the offer will be handled in a manner that does not contradict consumer interests (Cherry & Pidgeon, 2018). Contractual terms matter to the consumer (Tu et al., 2013), but the result-oriented aspects of PSS, in particular, are difficult to specify, which may be perceived as the provider withholding information (Rexfelt & Hiort af Ornäs, 2009). Consumers can be assumed to prefer the certainty of knowing how their needs will be met in result-oriented PSS, despite its being an inherent feature of these offers that this cannot a priori be completely specified.

Overall, the importance of information and trust in the PSS provider are assumed to be critical; however, the nature of the relationship between the two constructs has not been explored. This thesis posits that, at the adoption stage, trust in the provider may make product information more trustworthy and effective in assuring consumers that positive expectations of PSS attributes will be met while reducing uncertainties. As such, additional directly relevant product information, combined with a high degree of trust in the provider, may improve adoption intentions through a favourable evaluation of the PSS.

2.4 Prospect Theory in Consumer Decision-Making

The purpose of this section is to argue for a decision-making theory that can adapt previously generated findings in the literature on PSS—the variety of drivers and barriers, as well as the importance of information and trust—to accurately predict consumers' PSS adoption intentions. To this end, microlevel theories of consumer decision-making under uncertainty have been scrutinised in the field of economics. Von Neumann and Morgenstern's expected utility theory (1953) will be briefly examined first, and afterwards, Kahneman's and Tversky's (1979) prospect theory will be discussed before the background of its contribution to marketing and consumer choice research. This will result in several propositions to structure the development of an applied framework in the following chapter.

2.4.1 Deterministic Decision Theories

Decision theories seek to explain human behaviour, which is observable through the decisions and choices individuals make. Originally decision theories were based on insights from economics, with psychology and neuroscience making contributions more recently. On a general level, the field is divided into deterministic and stochastic theories (Blavatsky & Pogrebna, 2010).

Deterministic theories seek to predict decisions with increased precision and, put simply, assume that a decision-maker will make the same choice each time they are confronted with the same problem. Such choices are assumed to be completely determined by considerations of the decision-maker, and as such, the selection of an option is assumed to be, in theory, predictable with perfect certainty.

Stochastic theories, however, assume that there is an element of randomness to how decision-makers make choices. The same problem may, therefore, elicit different choices at different points in time, because a) choosing according to preferences may be prevented by a random 'tremble' that causes an individual to temporally disregard these preferences, b) a background 'white noise' error term may introduce an element of randomness in each choice, or c) an individual may simultaneously have multiple preference sets and choose a 'random preference' when confronted with a problem

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(Loomes et al., 2002). As such, stochastic models predict the likelihood with which an option is selected as a chance that is always greater than zero, but not fully certain (Blavatskyy & Pogrebna, 2010).

This thesis adopts a deterministic approach because, while stochastic theories can explain decisions ex-post, they are less suited to predicting decisions before they are taken. This is because it is uncertain to what extent a decision taken by a decision-maker in a stochastic theory is 'his own' or is the result of randomness in an environment that introduces tremble, noise, or the realisation of a random preference set, for example. As such, according to stochastic theories, there is always scope to explain a decision, but certainty in predicting what an individual may decide cannot be claimed, as this realised decision is not fully attributable to the decision-maker.

Deterministic decision theories are underpinned by expected value theory (EVT), which assumes that decision-makers are rational and risk-neutral and thus willing to accept 'fair' gambles with an expected value of zero (e.g., paying £5 to take part in a gamble with a 50% chance of winning £10). As an axiomatic theory based on perfect rationality, EVT was useful in underpinning early models of decision-making. However, in practice, it was observed that individuals are not perfectly rational and may not accept 'fair' gambles.

Von Neumann and Morgenstern's (1953) expected utility theory (EUT) considered this point and introduced utility to situations, including probabilities or risk. Building on early research on utility in the context of risk by Nicholas Bernoulli in the 18th century, EUT has found its way into game and decision theory through its core claim in the expected utility hypothesis. In sum, the expected utility hypothesis states that the subjective value associated with an individual's choice is the statistical expectation of that individual's valuations of the choice's possible outcomes. In contrast to EVT, EUT therefore allows decision-makers to be risk-averse or -seeking in addition to being risk-neutral according to their individual preferences (e.g., not taking part in the 'fair' gamble described above, but rather in one where the cost is £5 for a 51% chance of winning £10, resulting in an expected utility of £0.1).

Nevertheless, the expected utility theorem is assumed to hold only if its four axioms are fulfilled, as this constitutes a rational decision-maker in this context:

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- a) completeness (a decision-maker has defined preferences that allow for a full set of preferences—either $A > B$, $B > A$, or $A = B$)
- b) transitivity (a decision-maker decides consistently across more than two choices—if $A > B$ and $B > C$, then $A > C$)
- c) independence (an irrelevant third choice attached to either or none of two other choices defined by a preference order does not influence the preference order)
- d) continuity (for a set of preferences for three choices by a decision-maker there will be a probability of indifference between a mix of the most preferred and least preferred choice, and the other choice)

Should these assumptions about a decision-maker prove true, the following decision-making process may be assumed (see Figure 2-9). In this process, expected utilities are calculated based on objective values and probabilities of outcomes. Analogous processes executed for alternatives then allow for comparison, which determines the subsequent choice.

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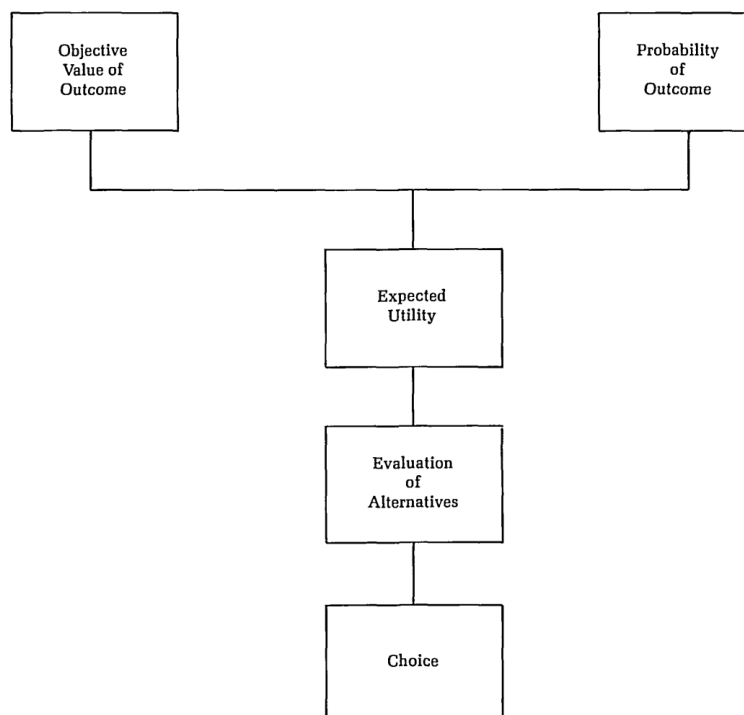


Figure 2-9: The expected utility decision-making process (Burton & Babin, 1989, p. 16).

EUT, as well as the EUT theorem and its axioms, have been critiqued on several grounds, which is why prospect theory (PT) has been designed ‘in essence, as a substitute for expected utility theory...the expected utility theory model did not fully describe the manner in which individuals make decisions in risky situations and that therefore, there were instances in which a decision-maker's choice could not be predicted’ (Edwards, 1996, p. 19).

2.4.2 Cumulative Prospect Theory

Kahneman and Tversky’s (1979) seminal paper in *Econometrica*, entitled ‘Prospect Theory: An Analysis of Decision under Risk’, demonstrated in several laboratory experiments that decision-makers’ actual behaviour cannot be predicted by EUT. They

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then developed a new model based on prospect theory that was able to describe such behaviour. This model departs from an overly rigid understanding of risk, which in EUT is associated with individuals instead of contexts. As such, Kahneman and Tversky's (1979) model development constitutes an inductive approach as opposed to EUT's deductive approach, as it is tied to observations instead of axioms (Newman, 1980). This has been described as PT's major strength: as it is grounded in observations about real behaviour, PT attempts and often succeeds in deliberately turning away from axiomatic assumptions based on the 'homo economicus' used in EVT, as they cannot be assumed to represent real life. In particular, the independence axiom described above was disproven in practice for EUT and EVT (Andreoni & Sprenger, 2010)—decision-makers are influenced by third, seemingly unrelated choices. Instead, PT proposes principles that describe commonly observed behaviour in lieu of axioms, meaning that PT seeks to model and account for real life, rather than prescribe optimal solutions.

These principles have since been verified in different contexts to varying success and accuracy (Edwards, 1996), but the descriptive and predictive powers of the theory remain undiminished: 'more than 30 years later, prospect theory is still widely viewed as the best available description of how people evaluate risk in experimental settings' (Barberis, 2013, p. 173). Here, it is worth noting that Tversky and Kahneman (1992) later extended PT by combining it with rank-dependent utility theory to form cumulative prospect theory (CPT). In current research, the two terms are often used interchangeably, as CPT is a direct improvement of PT (Barberis, 2013); in the following, however, CPT will be referred to for reasons of accuracy (e.g., Fennema & Wakker, 1997).

Four major principles are at the core of CPT, as they define decision-making under conditions of uncertainty and risk: reference dependence, loss aversion, diminishing sensitivity, and probability weighting.

First, reference dependence refers to the concept that individuals derive utility not from an absolute level of value or welfare that is provided by a choice, but rather from the relative gains or losses from a reference point, which in Figure 2-10 (a) is at the equilibrium. This means that individuals are more interested in relative changes in relation to a previously established reference point than in the absolute change itself.

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Second, loss aversion implies that losses are felt more keenly than gains by decision-makers, which makes them disproportionately more sensitive in the area of losses than in the area of gains. This has been summarised in Figure 2-10 (a), showing that the psychological value of gambles in the region of losses drops more steeply than that in the region of gains rises, as ‘consumers weigh losses from a reference point more than equivalent sized gains’ (Hardie et al., 1993, p379). In Kahneman and Tversky’s (1979) experiments, the steeper decline of the value function in the region of losses was proven by offering individuals gambles with 50% chances of winning \$110 or losing \$100. EVT would assume that the positive expected value of \$5 of the first outcome makes it the better option. However, as the reference point has an expected value of zero (i.e., not accepting the gamble), individuals tend to be deterred by the prospect of losing \$100 more than by the prospect of gaining of \$110, and thus reject the gamble.

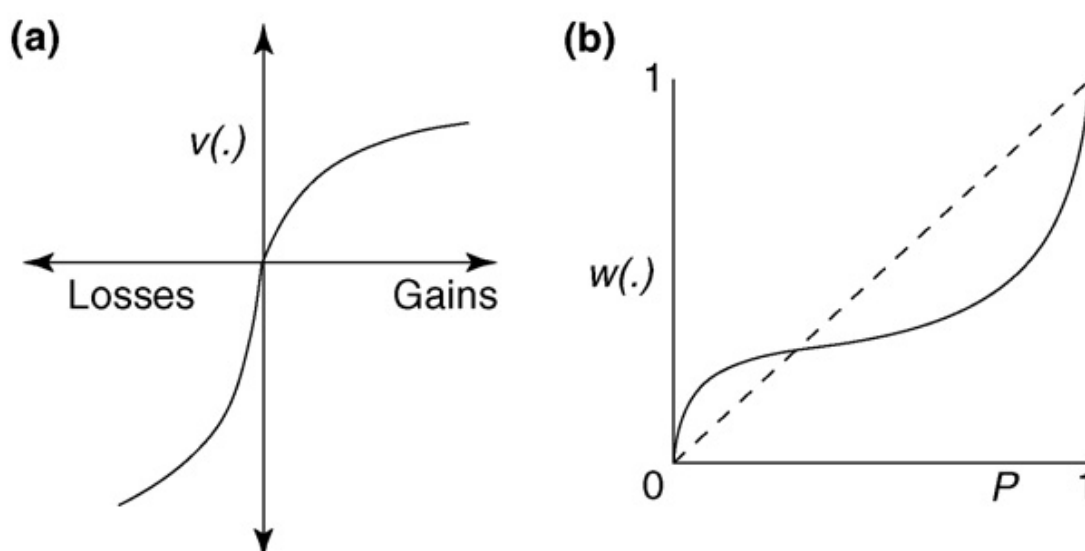


Figure 2-10: Value (a) and probability weighting functions (b). $v(\cdot)$ refers to the psychological value of the offer around the reference point, with monetary losses and gains. $w(\cdot)$ refers to the psychological value of weighted probabilities.

Third, the value function is concave in the area of gains and convex in the area of losses, showing that, as gains and losses increase, the value function tapers out, which

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is described as diminishing sensitivity (Edwards, 1992). For example, a loss of \$100 is not felt twice as strongly as a loss of \$50.

Fourth, probability weighting refers to the finding that decision-makers do not weigh outcomes by their objective probabilities, but by transformed probabilities that are expressed in a weighting function (see Figure 2-12 (b)), which is the extension proposed by Tversky and Kahneman (1992) to form CPT. This function shows that about 80% of individuals tend to overweigh small probabilities and underweigh large probabilities (Bruhin et al., 2010); for example, a 1% risk of a loss in comparison to a 2% risk of a loss seems more severe than a 32% risk versus a 33% risk (Gonzalez & Wu, 1999).

2.4.3 CPT Principles in Consumer Adoption of PSS

Based on a review of the literature, Barberis (2013, p. 173) observed that applying CPT is difficult as ‘it is hard to know exactly *how* to apply it’. As such, research and practice have branched out into different areas, as observations of human behaviour made through the lens of CPT have been synthesised into a number of effects.

The endowment effect, for example, may be used by an organisation to shift a reference point towards perceived ownership of a product through initially free access, increasing likelihood of subsequent purchase to avoid ‘pain-of-losing’ (although rival explanation exist, compare Weaver and Frederick, 2012). Similarly, framing effects may be used to deliberately present choices in terms of gains or losses—for example, by not discounting early registration for an event, but by punishing late registration, motivating decision-makers to register early. If the organisation imposes penalties for late registration, early registrations at a price not including the penalty become the default, or anchor, which acts as the reference point against which alternatives are compared. In this case, the departure from the reference point engenders a loss and in this area, individuals tend to be risk-averse: individuals are more likely to register early to avoid a loss (Gächter et al., 2009).

Both effects play on deliberately shifting an individual’s reference point to be conducive to a certain choice that is desired by the organisation or individual that sets

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up the choice context. This is where agency theory and CPT meet in a recently coined ‘behavioural agency theory’ (Pepper & Gore, 2012).

The role of this reference point in the adapted two-step consumer decision-making process according to CPT based on Kahneman and Tversky’s (1979) and Thaler’s (1985) earlier assumptions is complex. The following figure shows that this process features an editing and evaluation phase (Puto, 1987) (see Figure 2-11).

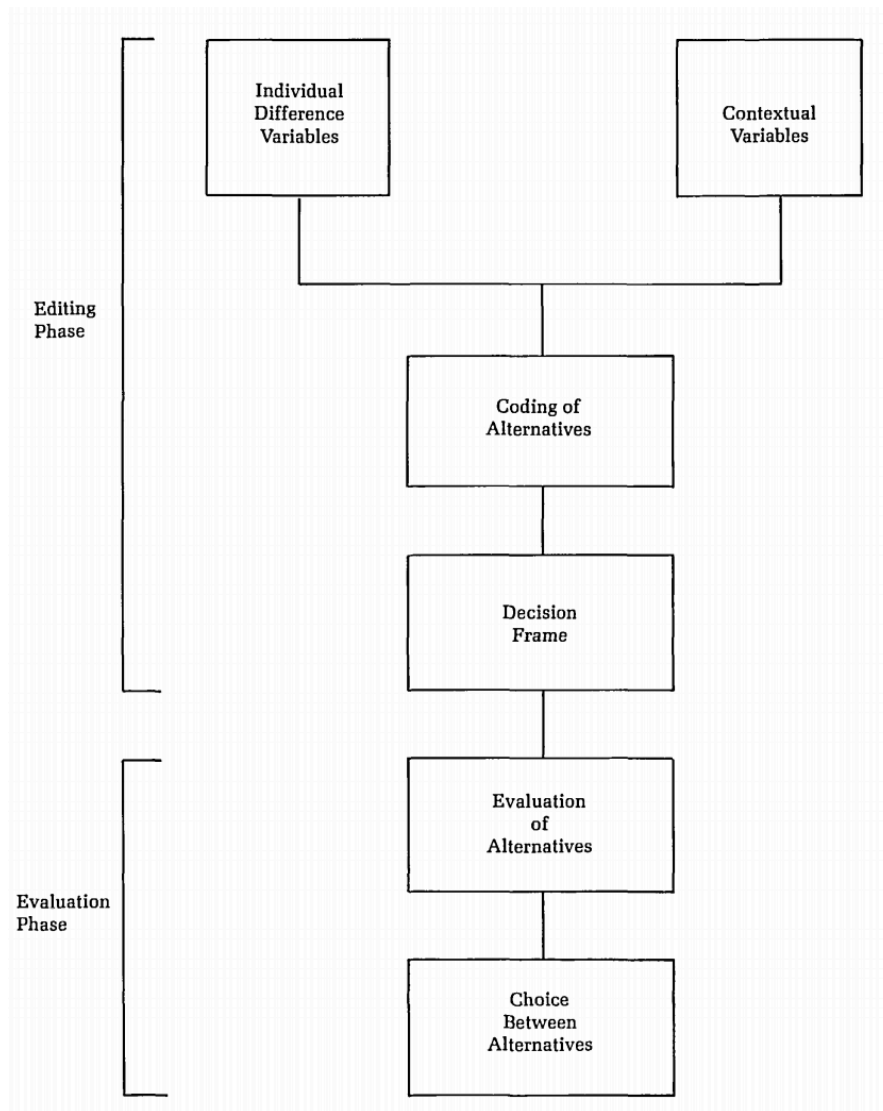


Figure 2-11: Consumer decision-making process in CPT (Burton & Babin, 1989, p. 18).

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During editing, the buyer is presented with objective information pertinent to the decision, for example, product information or prices. The alternatives (i.e., the set of decisions available to the consumer) are then coded based on this information (Levin & Gaeth, 1988). During this coding process, both individual-difference variables (for example, pre-existing knowledge about the product category, beliefs, risk-taking propensity), as well as contextual variables (for example, how the decision is framed by the seller) may alter how the alternatives are perceived and coded. These two variables may interact – consumers with more knowledge about a product category may be less receptive to framing attempts.

During this coding process, alternative are compared against a reference point, serving what Burton and Babin (1989, p17) describe as a ‘zero-point’. This reference point may be internally assumed by the decision-maker or introduced deliberately through contextual variables (e.g. Grau & Folse, 2009). In the context of purchase decisions, the initial reference point is assumed to be not to purchase, although a company may attempt to frame the decision as purchase of one of several options to lure a consumer into disregarding the alternative of no purchase. The result of this editing stage is a set of alternatives, each compared against a reference point and each framed according to internal and external variables.

Perceived value in this context refers to the expectations that consumers associate with the choice decision to buy. Perceived value is often defined based on Zeithaml’s (1988) focus on the trade-off between quality and price, and the notion that perceived value ‘results from an evaluation of the relative rewards and sacrifices associated with the offering’ (Yang & Peterson, 2004, p. 803). Such perceived value definitions are conceptualised as being uni-dimensional. However, more integrative understandings of perceived value might be more applicable to the case of PSS as complex product-service bundles require a consumer to consider more than price and quality. As such, this thesis will follow the direction of Woodruff’s (1997, p. 142) definition that focuses on beneficial product attributes to achieve goals: ‘a customer’s perceived preference for and evaluation of product attributes, attribute performance, and consequences arising from use that facilitates (or blocks) achieving the customer’s goal and purposes in use situations.’ This definition aligns with Sánchez-Fernández and Iniesta-Bonillo’s (2007, p. 441) argument that Holbrook’s (1999) multi-dimensional understanding of

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perceived value is better able to capture the breadth of considerations consumers make during product evaluation. Going forward, perceived value is conceptualised as multi-dimensional and concerns beneficial product attributes that contribute to goal realisation. Looking at the effects of perceived value, a high degree of perceived value has been repeatedly associated with higher purchase intentions (e.g. Dodds et al., 1985; Sweeney & Soutar, 2001).

Given the underexplored area of information pertaining to PSS—a product about which consumers have little existing knowledge—this thesis proposes that the provision of more objective product information could change subsequent coding of alternatives as knowledge has been improved. Such product information could alter the gap between the reference point and the prospect of choosing to consume the PSS alternative instead. The reference point would be the continued purchase of the conventional alternative to the PSS. Similar notions have previously been explored (e.g., Chang & Wildt, 1994; Dodds et al., 1985; Rao & Monroe, 1988), particularly in areas wherein consumers cannot test the product (e.g. Flanagin et al., 2014; Michaud & Llerena, 2011) such as online fashion purchases (Park et al., 2005). Van Weelden et al. (2016), therefore, argue that the provision of contextual information is critical to influencing risk-benefit perceptions in consumers.

To specify how this more specific product information could bridge the gap between the reference point and the prospect of choosing to purchase the PSS, it is necessary to examine the evaluation stage of the decision-making process. Here, alternatives are evaluated, and the alternative assumed to represent the best outcome in relation to the reference point is chosen (Puto, 1987).

However, beyond perceived value, uncertainty may manifest through perceptions of risk (Roselius, 1971), the integration and accounting for which was the original intent behind CPT. Perceived risk is defined as the ‘subjective expectation of losses’ from product purchase and use (Dholakia, 1997, p. 161) and has been previously shown to be detrimental to adoption of new products in other contexts (e.g., Featherman & Pavlou, 2003; Wang et al., 2013). Worries about potential losses arising from the decision to purchase are difficult to predict, as they are not tied to a known reward or sacrifice at the time of decision. As such, ‘neither the consequences of alternatives nor their probabilities of occurrence are accurately known’ (Dowling, 1986, p. 194), and

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the result of perceived risk manifesting is not cost, but loss. Typologies for different dimensions perceived risk have been proposed. For example, risk perceptions may be segmented according to the domain that may be affected by negative outcomes, resulting in functional, financial, safety, social, or psychological risk, or others. Ultimately, however, it appears that constraining perceived risk to these types, similar to the diversity of perceived values, is ‘not appropriate for all purchase situations...risk dimensions are product and situation specific’ (Simcock et al., 2005, p370).

Combining these notions along the lines of Wang and Hazen’s (2016) work on remanufactured engines, this thesis argues that, during the consumer decision-making process, the purposeful manipulation of prospects through product information can lead consumers to evaluate a given PSS as more beneficial than anticipated in comparison to the conventional alternative. These evaluations then lead to higher perceived value, which would improve adoption intentions. Similarly, product information can serve to reduce uncertainty in consumers, leading to a reduced level of perceived risk and mitigating the negative effects of perceived risk on adoption intentions. On this basis, the following theoretical framework is proposed (see Figure 2-12).

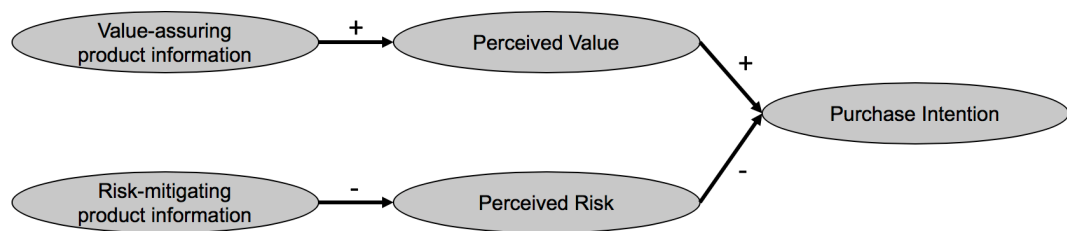


Figure 2-12: The theoretical framework of this study.

2.5 Chapter Output

This chapter has reviewed the existing literature. The following outputs have been generated in this process:

- PSS literature borrows from service science and servitisation literature to emphasise the meeting of needs and evidence its benefits for providers, but has developed from a more environmentalist tradition.
- PSS are largely inseparable from their underpinning business models and can be classified into product-, use-, and result-oriented types.
- Consumer adoption hinges on a large variety of drivers and barriers that differ between these types of PSS; at the top level, there is the lack of newness, ownership, and choice.
- AT, PT, and CCT approaches have been able to explore the factors that likely lead consumers to accept PSS post-purchase.
- The factors that are relevant to consumer adoption pre-purchase are unknown, and inferences from factors influencing post-purchase acceptance are not necessarily relevant during adoption.
- Trust in PSS providers has been discussed as being critical for adoption. It may be hypothesised that one of trust's roles is to ensure that product information related to the offered PSS is trustworthy.
- CPT is proposed to explain the adoption of PSS by looking at consumer evaluations of perceived value and risk.
- Trust in the objective product information given by PSS providers is proposed to foster favourable product knowledge conducive to such evaluations and subsequent adoption.

3. Model Development

3. Model Development

3.1 Chapter Introduction

This chapter is divided into five sections after this chapter introduction.

In Section 3.2, ‘PSS in Fashion and Apparel’, existing studies on fashion PSS for consumers are reviewed and classified to map the diversity of PSS that have emerged in this product category. The functions of the PSS are described, and their main mechanisms in generating a superior environmental performance explained. Based on this overview, a promising PSS is chosen and detailed in Section 3.3, ‘The ‘Fashion Subscription’ Case’. It is explained how this PSS works and from what angle it will be investigated in this thesis to generate insight into consumer adoption of PSS. Section 3.4, ‘Hypotheses Development’ applies the generic framework developed in the literature review chapter to this PSS case. Several hypotheses are made to predict why consumers would be willing to adopt the fashion subscription and what kind of product information could increase such willingness in several sub-sections. Section 3.5, ‘Applied Framework’, summarises and visualises these hypotheses.

Finally, Section 3.6, ‘Chapter Output’, draws the relevant points of this chapter together for an overview.

3.2 PSS in Fashion and Apparel

A comparatively large number and variety of PSS exist in the context of fashion, which is reflected in recent research activity in this area that has outpaced research on other product categories, with the exception of car-sharing. Based on a review of the literature, Table 3-1 is presented to give an overview; here, it is worth noting that some of the classifications of types were inductively developed by the author, based on similarities in the PSS functioning reported by different scholars.

3. Model Development

Table 3-1: Overview of fashion PSS types analysed in academic literature.

PSS Types	Example	Author
Repair/ redesign (PO)	Nudie Jeans, Patagonia	Armstrong and Lang, 2013; Armstrong et al., 2015; Armstrong et al., 2016; Chamberlin & Boks, 2018; Lang and Armstrong, 2018; Pal, 2016; Stål and Jansson, 2017
Customised/ participatory design (PO)	No provider named	Armstrong and Lang, 2013; Armstrong et al., 2015; Armstrong et al., 2016; Pal, 2016
Make-it-yourself (PO)	No provider named	Armstrong and Lang, 2013; Armstrong et al., 2015; Armstrong et al., 2016; Pal, 2016
Take-back for reuse (PO)	Boomerang, H&M, Indiska, Nudie Jeans, Filippa K; UFTD, Patagonia	Armstrong et al., 2015; Chamberlin and Boks, 2018; Corvellec and Stål, 2017; Stål and Jansson, 2017
Take-back for recycling (PO)	Boomerang, H&M, Filippa K Indiska, Nudie Jeans, Patagonia, UFTD, Vigga	Armstrong et al., 2015; Chamberlin & Boks, 2018; Corvellec and Stål, 2017; Pal, 2016; Stål and Jansson, 2017
Consultancy (PO/UO)	Filippa K; Nudie Jeans; Boomerang; H&M; KappAhl; Lindex; Indiska; Gina Tricot	Armstrong et al., 2015; Armstrong et al., 2016; Corvellec and Stål, 2017; Lang and Armstrong, 2018; Liedtke et al., 2013; Stål and Jansson, 2017
Per-item renting (UO)	Filippa K; UFTD; BagBorroworSteal; Rent the Runway; Girl Meets Dress, Tom Cridland	Armstrong and Lang, 2013; Armstrong et al., 2015; Armstrong et al., 2016; Chamberlin and Boks, 2018; Corvellec and Stål, 2017; Hirschl et al., 2003; Lang & Armstrong, 2018; Park and Armstrong, 2017; Retamal, 2017; Stål and Jansson, 2017
Subscription-based renting (local) (UO)	The Clothes Library; Resecond; Lånegarderoben; Helsinki Fashion Library	Armstrong et al., 2016; Corvellec and Stål, 2017; Pal, 2016; Pedersen and Netter, 2015; Rexfelt and Hiort af Ornäs, 2009
Subscription-based renting (online) (UO)	Fashion Hire, Gwynnie Bee, Letote	Park and Armstrong, 2017
Swapping (local) (UO)	No provider named – clothes swapping events given as examples	Armstrong and Lang, 2013; Armstrong et al., 2015; Armstrong et al., 2016; Lang and Armstrong, 2018
Swapping (online) (UO)	Bag Borrow; Steal and Rehash Clothes; Yerdle, Swap Style, Listia; Poshmark	Armstrong and Park, 2017; Pal, 2016; Park and Armstrong, 2017
One-off result renting (RO)	No provider named – eveningwear for occasions given as examples	Armstrong et al., 2016
Result-subscription (RO)	Vigga	Brun-Petersen and Riisberg, 2017; Corvellec and Stål, 2017; Pal, 2016

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Some product-oriented PSS focus on the fashion production stage by including consumers in design activities to foster attachment to clothing and prevent stylistic obsolescence (Armstrong et al., 2015, 2016; Pal, 2016). In the use-stage, repair is similarly aimed at lengthening product lifecycles, while take-back systems utilise the remaining value bound in clothing after the first lifecycle (Corvellec & Stål, 2017). Consultancy services include a variety of activities that may include advice by a stylist on how to wear already-owned clothing by a brand as part of new styles, what new items benefit a consumer most (Armstrong et al., 2015), information about maintenance of clothing, and information about more sustainable ways of consuming clothing (Stål & Jansson, 2017). In the first two cases, reuse and responsible purchasing is encouraged; in the third longevity of items is increased; and finally, more generally sustainable consumption is encouraged.

In use-oriented PSS, renting services are primarily differentiated by their payment methods. The most common case here is that individual items are rented out short-term to users from brick-and-mortar stores as an alternative to purchase (Stål & Jansson, 2017). Alternatives are fashion libraries (Pedersen & Netter, 2015) or online platforms akin to fashion libraries (Park & Armstrong, 2017). These are coined ‘subscription-based renting’, where consumers pay a fixed monthly fee and can select and use a certain or unlimited amount of clothing items for a fixed time with subsequent return. That the offline and online versions of this PSS are different is not always made explicit by authors (e.g., Pal, 2016) although there are significant differences for the PSS and its consumer perception (Park & Armstrong, 2017). Swapping services are less discussed by academics, but are the only PSS that result in consumer-to-consumer ownership exchanges, even if they are mediated by a community-based group, a company organising a clothing swap event with entertainment (Armstrong et al., 2015), or an online platform (Park & Armstrong, 2017). Use-oriented PSS enable consumers to try out new styles or use items for specific purposes and therefore complement existing wardrobes to discourage the consumption of items that are not necessarily worn frequently.

Finally, two result-oriented PSS are proposed, the first of which is the ‘one-off result renting’ (Armstrong et al., 2015, p34), which in practice is a more result-oriented case of short-term renting, whereby the provider actively recommends items to the consumer to meet a certain need. The second is a ‘result-subscription’, which aims to continuously meet consumer needs in a certain product type. Both result-oriented PSS use the providers’

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existing skills and resources to meet consumer needs directly and may also combine the environmental advantages of the product- and use-oriented PSS.

Among these offerings, the ‘result-subscription’ embodies the full range of mechanisms supposed to result in environmental savings as envisioned by Goedkoop et al. (1999) and Mont (2002) and also causes all three change dimensions to apply. Diffusion of such a PSS would likely cause a significant change in consumer behaviour through a change in practices and is, therefore, an ideal testbed for further investigation of consumer adoption of PSS.

3.3 The ‘Fashion Subscription’ Case

This ‘result-subscription’ was first mentioned in Brun-Petersen and Riisberg’s (2017) case study of the Danish company Vigga, which offered a subscription that circulated pre-selected packages of babywear on a recurring basis to cover about 70% of required clothing for babies and toddlers. Eight different sizes were on offer, and parents could choose between two marginally different styles for most sizes. Each package contained 15-20 pieces of clothing. After a set period, or when the child outgrew the clothing, the articles would be sent back to Vigga, professionally checked, ‘reset’, and re-circulated while the parents received the next package (p. 222). The PSS was marketed to affluent urban parents with latent environmental and anti-consumerist attitudes who wanted sustainable and natural clothing for their children. Vigga’s marketing communication was divided into a sustainability-oriented opposition to ‘the brain-dead use and throwaway culture we are all a part of’ (p. 223), which was balanced with comprehensive statistical and scientific information on the financial and convenience benefits to frame the offer as the ‘wise and practical choice’ (p. 224).

Multiple environmental benefits emerged. The clothing was designed and manufactured by Vigga to be durable and timeless to reduce wear-and-tear and prevent psychological obsolescence, prolonging the usable lifecycle of the products and leveraging Vigga’s textile experience. Consumers were given guidance to not wash the clothes at high temperatures, which also reduced energy requirements and prolonged the lifecycle of the clothing. As the packages met most of the babies’ clothing needs, fewer items were required to meet the needs of more consumers. The pre-selected packages were kept

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largely the same all year round, which resulted in low seasonal variability. In cases where individual items from the packages had reached their end-of-life unexpectedly, the company then had the opportunity to replace just these items. This was aided by the company's freedom to alter the contents of the packages within the limits of the desired size to further maximise asset utilisation. Using these mechanisms, Vigga was able to circulate the packages five to eight times on average, which represents significant environmental savings.

In this study, a PSS configuration based on Vigga, subsequently termed a fashion subscription, will be investigated further to contribute to the understanding of consumer adoption of radically innovative and sustainable PSS. This follows other researchers' examples of using hypothetical PSS to analyse consumer adoption (e.g., Armstrong et al., 2015; Cherry & Pidgeon, 2018; Rexfelt & Hiort af Ornäs, 2009).

The fashion subscription analysed in this study 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 returned to the provider, and different 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.

This fashion subscription, therefore, taps into the same mechanism as Vigga's PSS described by Petersen and Riisberg (2017) to improve environmental performance, but also incorporates insight on feasible fashion PSS configurations by others (e.g., Armstrong et al., 2015, 2016; Retamal, 2017). It combines product-oriented, use-oriented, and result-oriented characteristics and could, in theory, completely replace the conventional consumption paradigm in clothing.

While the specifics of the employed methodology, sampling strategy, and treatment of control variables will be detailed in the methodology chapter, several of these decisions have implications for the following hypotheses development and theoretical framework.

This study differs from other studies on hypothetical PSS in adopting a more radical and detailed PSS, offered by the most likely provider as opposed to an unspecified one, and

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investigating it with the most likely group of early adopters rather than a sample reflecting the general population.

As such, consumer adoption of the fashion subscription will be investigated quantitatively with a sample of young female consumers who are screened to have an existing propensity to buy fashion products online. This decision was taken as other studies show that PSS fit naturally with certain consumer groups based on their preferences and use-regimes (Armstrong et al., 2015; Cherubini et al., 2015; Retamal, 2017), and young women arguably have a greater natural fit with the fashion subscription (Pedersen & Netter, 2015).

Furthermore, the provider of the fashion subscription is self-elicited by study respondents as a company from which respondents have purchased products several times before. This removes confounding effects resulting from respondents not knowing what product assortment, branding or price level the otherwise unknown PSS provider offers – a factor that has likely significantly flawed previous studies as respondents were asked to comment on a PSS by an unknown provider selling unknown products at an unknown price (e.g. Catulli et al., 2017; Rexfelt & Hiort af Ornäs, 2009).

Finally, this provider is also self-elicited to be a highly trusted brand. As a variety of previous studies have established that trust in the provider is critical in assuring consumers of perceived values and mitigate perceived risks (e.g., Cherry & Pidgeon, 2018; Poppelaars et al., 2018), this study, therefore, assesses how the picture develops if trust in the provider is high. This combats the same flaws proposed in the previous paragraph and removes the confounding effect of an unknown level of trust in an unknown provider. This then contributes to understanding the role and limits of this construct in fostering consumer adoption, which is extended by assessing the effect of additional product information from a trusted source.

As such, this approach enhances the realism of the study and improves the validity of the findings. In the following, hypotheses pertaining to consumer adoption of the fashion subscription are developed.

3.4 Hypotheses Development

In the following, the generic framework based on prospect theory that was developed during the literature review is applied to the context of the fashion subscription. This necessitates drawing on the literature on consumer adoption of fashion PSS in particular; however, studies on other product categories are also utilised where relevant.

As such, hypotheses on perceived values assumed to contribute to purchase intention are developed first. Subsequently, perceived risk hypotheses are developed that reduce purchase intentions. Several hypotheses on the effects of different types of product information expected to change the evaluation of perceived values and risks are proposed thereafter. Finally, hypotheses relating to trust in the provider and several demographic variables are proposed.

3.4.1 *Perceived Values*

The described fashion subscription may present consumers with several benefits over the current consumption paradigm. In this sense, the perceived values proposed here deviate from the perceived risks as the values can be compared against the default of buying clothing conventionally.

The first of these benefits can be assumed to be the potential for monetary savings. While this point is mentioned repeatedly in literature on consumer adoption of PSS (Tukker, 2015), it is especially relevant to fashion as a product category that has been increasingly commodified. The amount of money expended on meeting clothing and fashion needs matters to consumers and even more so to younger consumers, who buy more fashion items. This is in line with previous research indicating that financial considerations are an important element in consumer decision-making (Sweeney & Soutar, 2001) and that consumers realise that PSS can be a cheaper option when their needs are temporary (Rexfelt & Hiort af Ornäs, 2009; Vezzoli et al., 2015). Similarly, it has been argued that consumers like the idea of reduced expenditure when consuming PSS as symbolic value as part of a ‘smart moneysaver’ lifestyle (Catulli et al., 2017). In the case at hand, consumers may evaluate the fashion subscription to offer cost-saving benefits as they are aware that many purchased items are either worn rarely or only for brief periods according

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to trends and seasons (Armstrong et al., 2015). Summarising the ‘perceived cost value’ is the expectation a consumer has that they can save money by choosing the fashion subscription over conventional alternatives. As such, the following hypothesis is proposed:

H1: Perceived cost value is positively related to purchase intention.

A second benefit that may improve consumer opinion of the fashion subscription and contribute to purchase intention is related to a core proposition of the result-oriented characteristics of the PSS. As the fashion subscription does not allow consumers to choose the exact clothing that will be delivered, the consumers will inevitably receive and have access to unanticipated items. While this point also presents risks that will be expanded upon later, the increased variety in their wardrobe that consumers have access to may be seen as a benefit. Consumers desire change, renewal, and identity and these desires are enacted and reflected through fashion (Niinimäki, 2010). The fashion subscription increases the diversity and variety of items to realise these desires, which also prevents boredom (Armstrong et al., 2015). In comparable fashion-related PSS examples, this point has been favourably received by consumers, as they are aware that they will not always be able to find clothing that suits them or to leave their comfort zone, despite their desire to (Armstrong et al., 2016). As such, fashion subscriptions enable the consumer to try out items that would have been overlooked or inaccessible under normal circumstances (Retamal, 2017). The ‘perceived variety value’ is defined as the consumer’s expectation of having access to a wider variety of clothing by consuming the fashion subscription than would be available through conventional alternatives. It can, therefore, be assumed that:

H2: Perceived variety value is positively related to purchase intention.

A third benefit refers to the rationale behind all PSS. Widespread consumer adoption of the PSS would reduce the material and energy-intensive production and disposal of clothing items, which would reduce the significant burden of this industry on the environment, and this is the most commonly cited benefit according to Annarelli et al.’s (2016) review. While studies on the impact of green attitudes and purchase behaviour are rather muted with few exceptions (Joshi & Rahman, 2015), qualitative studies in the PSS

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context have painted a different picture. It has been argued that consumers do take the environmental impacts of their purchase behaviour into consideration (Cherubini et al., 2015; Van Weelden et al., 2016), which is especially the case in studies in fashion contexts (Armstrong et al., 2015; Brun-Petersen & Riisberg, 2017). Here, it is also relevant that authors have observed a shift in consumer culture towards attitudes focused on wellbeing and sustainability, of which environmental considerations are a part (Santamaria et al., 2016). The ‘perceived environmental value’, therefore, describes the expectation that consumption of the fashion subscription instead of conventional alternatives will have a beneficial effect on the environment. As such, it is proposed that:

H3: Perceived environmental value is positively related to purchase intention.

Several other potential values were also considered. The unburdening and decluttering aspect of PSS was considered (Kang & Wimmer, 2008); however, the dominant opinion in literature is that, in practice, ownership is considered desirable for several reasons, even if clutter is regarded as negative (Catulli et al., 2017; Tukker, 2015). It could also be argued that the fashion subscription includes a social community aspect, as clothing is shared in a manner similar to that of fashion libraries. However, Park and Armstrong (2017) indicate that, in eCommerce contexts, the physical and emotional distances between consumers likely impede a sense of connectedness. A final point that was considered relates to whether the PSS could be perceived as enabling consumers to ‘dress better’, which was perceived a benefit in cases featuring one-on-one consultancy and bespoke fashion results-oriented PSS (Armstrong et al., 2015). In the fashion subscription, there is insufficient interaction to allow consumers to engage with the provider to this extent, as this would make the PSS part of a more expensive premium niche market and constrain the environmental savings as asset utilisation declines. Access to greater variety, a potential prerequisite for ‘dressing better’ is, therefore, the more valid assumption.

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3.4.2 Perceived Risks

As opposed to its perceived values, the perceived risks of the fashion subscription cannot be compared to the conventional fashion consumption paradigm, as they do not exist in this paradigm.

The first of these risks relates to the concern about the physical condition of the items received through the fashion subscription, which is a much smaller issue when clothing is inspected and bought in a store. This is because the received items are largely ‘not new’ and have been worn by other, unknown consumers of the fashion subscription. Here, various studies have indicated that consumers are anxious about this point in most use-oriented PSS cases and in textile-related contexts particularly (e.g. Armstrong et al., 2015; Retamal, 2017). On a deeper level, this may coincide with the development that hygiene and cleanliness expectations have become more rigorous in developed countries (Mylan, 2015). However, consumers may also be concerned that the received items will be damaged or not fit for use (Rexfelt & Hiort af Ornäs, 2009) and may present health risks (Catulli et al., 2017). In the case of fashion, this would manifest in dirty or damaged clothing, which reduces the expected utility a consumer may gain from it if they choose not to wear it due to such concerns. If such worries persist, the consumer may be dissuaded from adoption. These worries are enshrined in the ‘perceived physical condition risk’ that describes the fear of being provided with dirty or damaged clothing through the fashion subscription. It can, therefore, be expected that:

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

While the variety provided by the result-oriented aspect of the fashion subscription may be appreciated as a benefit, the same aspect of the offer may also result in perceived risks. The primary risk here is that the PSS provider will supply the customer with products that do not match the consumer’s preferences or fit into their existing practices (Mylan, 2015). Consumers are highly aware of this risk, as relinquishing freedom of choice diverges fundamentally from the current consumption paradigm (Poppelaars et al., 2018), and is only known from pure service contexts where the customer has insufficient knowledge to make an informed choice and merely specifies a desired outcome or need. In the fashion context, consumers may worry that a provider has insufficient knowledge or stock to supply them with clothing that fits their size and matches their stylistic preferences, as

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these are assumed to be highly individualistic (Armstrong et al., 2015; 2016; Brun-Petersen & Riisberg, 2017). Should these worries persist, the expected prospect of adopting the fashion subscription would be severely reduced and adoption propensity dissuaded. This fear is described in the ‘perceived preference risk’ as the fear that the fashion subscription provider would provide the consumer with fashion that does not suit the consumer’s size or style preferences. As such, it is proposed that:

H5: Perceived preference risk is negatively related to purchase intention.

Several authors have indicated that convenience may be a benefit of PSS over conventional alternatives (e.g. Catulli & Reed, 2017; Gottberg et al., 2010). While this may be true for some product categories and consumers, in the case of the fashion subscription, it can be hypothesised that this convenience has a negative impact on consumer adoption. Shopping as an activity has been shown to be particularly enjoyable to female consumers, especially in the fashion context (Chang et al., 2004), which ties in with hedonic consumer attitudes (Babin et al., 1994) as well as socialising (Pedersen & Netter, 2015). Armstrong et al. (2015) thus observed that consumers may assume that an enjoyable activity will be rendered redundant by PSS consumption, which is reflected in Rexfelt and Hiort af Ornäs’ (2009) AT perspective. Such concerns should reduce consumers’ willingness to adopt the PSS. This ‘perceived shopping opportunities risk’ is defined as the fear that consuming the fashion subscription would mean that the consumer has fewer opportunities to enjoy themselves through shopping. Therefore:

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

Two further risks stem from the lack of ownership in the fashion subscription. First, there is an emotional side to this, as consumers build relationships with the products they use. Relinquishing usership at the end of the contract could then evoke feelings of loss or sacrifice, as consumers like to ‘grow materially’ (Liedtke et al., 2013). This is particularly applicable to fashion, as memories and identity can be tied to clothing items (Armstrong et al., 2015). Research also indicates that such relationships with objects are quickly formed, as it is difficult for consumers to disentangle products from the practices for which they are used, even if they do not own the products (Cherry & Pidgeon, 2018).

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Fears that such feelings may occur at the end of use may even reduce satisfaction with the PSS during use (Catulli & Reed, 2017). This is coined ‘perceived return sacrifice risk’ and describes the fear that returning the clothing back the provider of the fashion subscription will cause a sense of loss in the consumer. It is proposed that:

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

A second perceived risk related to the lack of ownership stems from the closer relationship between the provider of the fashion subscription and the PSS user. As the two parties engage in a contract, the consumer is obligated to return the clothing in a timely manner and in acceptable condition (Brun-Petersen & Riisberg, 2017). These additional obligations have been claimed to be a major source of anxiety for consumers, symbolising a loss of flexibility, autonomy, and control (Cherry & Pidgeon, 2018). Consumers may be acutely aware that they are in a weak negotiating position with the provider and cannot always expect leniency when returning items late or damaged. A perception of ‘lock-in’ or ‘stranglehold’ may even ensue (Poppelaars et al., 2018; Rexfelt & Hiort af Ornäs, 2009). Contractually agreed penalties may then be leveraged by the provider, causing consumers to expend more resources than previously anticipated (Reim et al., 2015; Retamal, 2017). These issues are compounded by uncertainty, as it is not possible to exhaustively define what constitutes significant delay or damage. In sum, ‘perceived return liability risk’ defines the worry that the consumer will be held financially liable for late or damaged returns when using the fashion subscription. Therefore:

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

3.4.3 Product Information

The fashion subscription is not known to consumers beyond the case of Vigga’s own consumers. Therefore, consumer knowledge of the PSS is initially zero, as it is a new product. As argued in the section on consumer adoption, it is hypothesised that a trustworthy PSS provider could improve adoption intentions by offering more specific product information that is trusted by consumers. This product information could assure

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consumers that perceived values will be delivered by the PSS, as well as the alleviation of sources of perceived risks.

Various product information types could be investigated but, as the next chapter on methodology shows, each additional type significantly increases the required sample size for this study. Therefore, four types of product information are investigated based on those which are assumed by other authors to be the strongest determinants of purchase intention.

An initial perceived value that is common to three change dimensions in lack of newness, ownership, and choice, is the expectation that the consumption of PSS instead of conventional alternatives will be cheaper. Consumers, however, struggle to compare the costs of buying temporary access with those associated with buying permanent ownership (Armstrong et al., 2015), as they are not familiar with the adoption of a lifecycle approach to costing (Rexfelt & Hiort af Ornäs, 2009). It has been claimed that this causes consumers to underestimate the potential cost value of PSS (Vezzoli et al., 2015). More specific product information assuring consumers that money-saving potentials will be realised by consuming the PSS over conventional alternatives could therefore improve the associated perceived value.

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

Second, according to research, consumers also struggle to estimate the environmental benefits of PSS consumption (Vogtländer et al., 2002) or of cases in which the products are not new (Michaud & Llerena, 2011). In the case of the fashion subscription, this may be because consumers are unfamiliar with how clothing is produced and the quantities of raw materials that are necessary during the different production processes (Gwozdz et al., 2017). This is also because consumers tend to overestimate the environmental impact of transporting products in comparison to their production and disposal. 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 reuse.

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

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Third, concerns about the physical condition in which used products are delivered to users of the fashion subscription could be alleviated through more specific product information on how the provider treats returned clothing before delivery. The desire for more information on this critical point was voiced by consumers in previous studies (Armstrong et al., 2015; Catulli et al., 2017) and is based on findings that ‘a lack of understanding and knowledge of refurbished products fosters low quality perceptions’ (Van Weelden et al., 2016, p744). As such, more specific product information relating to the physical condition of the delivered clothing could reduce the severity of perceived risks in this area, as this lack of understanding is reduced by more information.

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

Fourth, 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 details that consumers can submit regarding size and style preferences (Brun-Petersen & Riisberg, 2017), which providers of fashion PSS also consider in practice when offering a wide variety of clothing (Retamal, 2017).

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

Additional product information on the remaining perceived value and perceived risk constructs was considered, but this would have required a progressively larger sample size as will be expanded upon in the research methodology chapter. As such, two value-assuring and risk-mitigating product information types were chosen based on the frequency with which they are mentioned in previous studies in the fashion PSS literature.

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3.4.4 Control Variables

Finally, trust in the provider and demographics are controlled for as they are factors that might influence purchase intention. The level of trust in the provider offering the fashion subscription is designed to be high as explained above and specified in the methodology chapter, but this is also formally controlled for.

In terms of demographics, three demographic variables may be hypothesised as impacting on consumers' intention to purchase the PSS.

First, ownership-less consumption has been argued to be more appealing to younger consumers (Bardhi & Eckhardt, 2015), which was also mirrored in fashion PSS (Armstrong et al., 2015; Pedersen & Netter, 2015). Reasons for this are likely to be numerous and to range from personal value systems that make them less risk-averse (Piscicelli et al., 2015) to younger consumers more utilitarian attitudes towards and fluid relationships with products (Tu et al., 2013; Hirschl et al., 2003). Therefore, the potential effect of age on purchase intention is controlled for in this study.

Second, while it may be proposed that consumers with lower incomes may be more likely to adopt PSS due to the cost-saving potentials (Tu et al., 2013), most studies indicate that this is not the case. Hirschl et al. (2003) and Cherubini et al. (2015) argue that consumers in lower income strata value ownership and predictability disproportionately, while Cherry and Pidgeon (2018, p. 5) suggest that PSS may be more 'suitable for those with enough income and security to mitigate such [financial] risks'. As such, the potential effect of income on purchase intention needs to be controlled for.

Third, it may be hypothesised that more educated consumers are more likely to adopt PSS, because they are better able to understand the offers themselves (Catulli & Reed, 2017; Poppelaars et al., 2018) and their cost-saving potentials in particular (Vezzoli et al., 2015; Rexfelt & Hiort af Ornäs, 2009). This is corroborated by studies showing that sharing attitudes are more prevalent among more educated consumers (Piscicelli et al., 2015), which Hirschl et al. (2003) summarise under the 'open-minded' consumer label. Therefore, the potential effect of education on purchase intention is controlled for in this study.

Controlling for the location of consumers in urban or rural areas was also considered. Mont et al. (2006) and Cherubini et al. (2015) claim that urban consumers may be more

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likely to adopt use-oriented PSS due to living space constraints in the case of prams and shorter usage times in the case of car-sharing. In the case of the fashion subscription, however, these conditions are not relevant, so the location of the consumers are not controlled in this study.

3.5 Applied Framework

The hypotheses used to develop the applied framework of this thesis are summarised in Table 3-2 on the following page. It shows that purchase intention as a proxy for willingness to adopt the fashion subscription PSS is predicted by the perceived value and perceived risk constructs, as well as trust in the provider and the three demographic factors. Some of the perceived value and perceived risk constructs, in turn, are predicted by value-assuring product information and risk-mitigating product information, respectively.

Table 3-2: Overview of hypotheses investigated in this thesis.

Hypothesis	
H1	Perceived cost value is positively related to purchase intention.
H2	Perceived variety value is positively related to purchase intention.
H3	Perceived environmental value is positively related to purchase intention.
H4	Perceived physical condition risk is negatively related to purchase intention.
H5	Perceived preference risk is negatively related to purchase intention.
H6	Perceived shopping opportunities risk is negatively related to purchase intention.
H7	Perceived return sacrifice risk is negatively related to purchase intention.
H8	Perceived return liability risk is negatively related to purchase intention.
H9	Additional cost product information is positively related to perceived cost value.
H10	Additional environmental product information is positively related to perceived environmental value.
H11	Additional physical condition product information is negatively related to perceived physical condition risk.
H12	Additional preference product information is negatively related to perceived preference risk.

These relationships are also visualised in Figure 3-1 on the following page.

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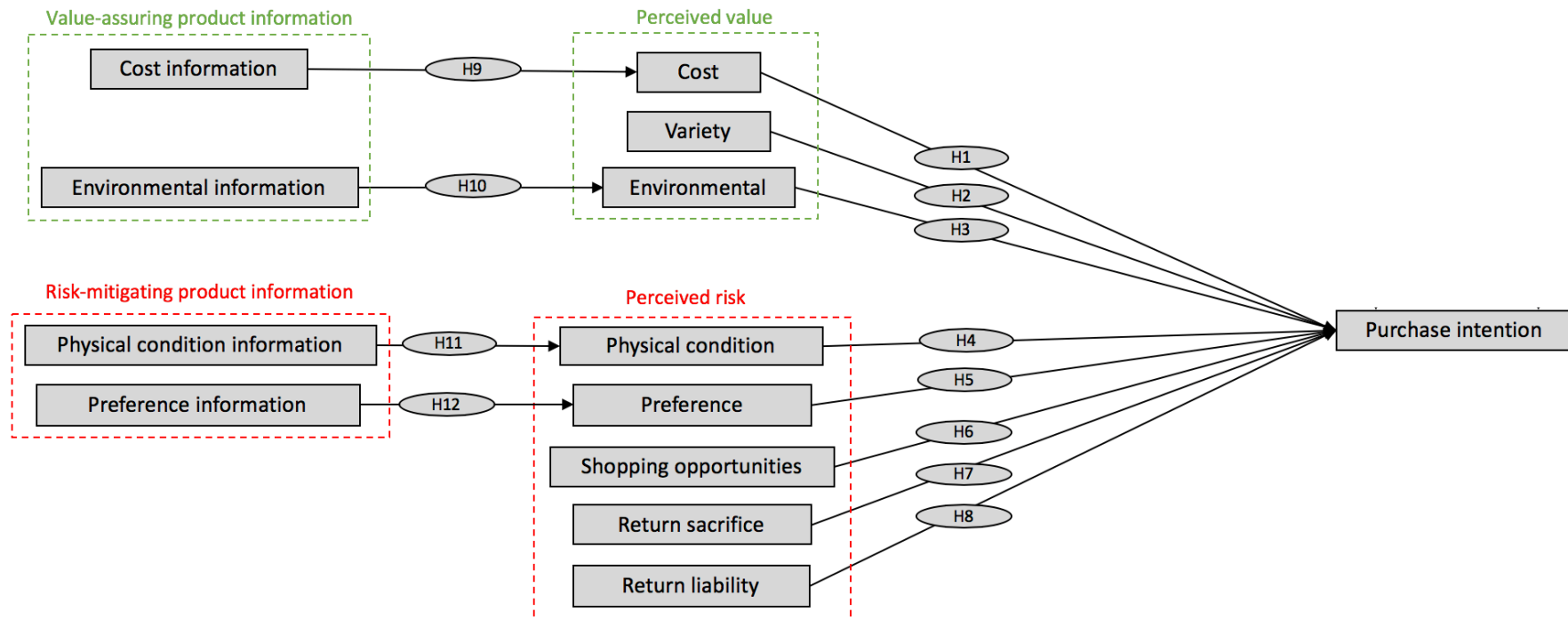


Figure 3-1: The applied framework of this study.

3.6 Chapter Output

This chapter generated the applied framework that will be investigated in the remainder of this thesis. Specifically, the following outputs were generated:

- Based on a review of reported PSS configurations in the context of fashion, a radically different PSS featuring the three change dimensions in a lack of newness, ownership and choice was identified.
- The fashion subscription departs from the current fashion production and consumption paradigm to facilitate significant environmental gains, but it can also be expected to struggle with diffusion outside of niche markets.
- To improve the practical insight generated from this study and acknowledging the importance of fit between PSS and consumer, as well as trust in provider, the decision has been taken to investigate this fashion subscription with likely consumers and as being provided by a highly trusted brand.
- Applying the propositions generated over the course of the literature review chapter to this PSS case has resulted in an applied framework predicting purchase intentions as a proxy to consumer adoption.
- In this framework, factors hypothesised to impact on purchase intentions have been modelled after the distinction of perceived values and perceived risks; for this, the literature on the interchange of the fashion product category and PSS has been used.
- Access to more specific product information about the ‘fashion subscription’ is hypothesised to increase perceived values or reduce perceived risks, thereby indirectly improving purchase intentions.

4. Research Design and Methodology

4.1 Chapter Introduction

Following this introductory section, this chapter is split into four sections.

Section 4.2, ‘Questionnaire-based Experiment’, defines this thesis’ adopted approach. First, the the general methodology is detailed in Section 4.2.1, ‘Covariance-based SEM’, and second, Section 4.2.2, ‘Assessing and Improving Model Fit’, goes into more detail about requirements for the application of this methodology. The next two sections, Section 4.2.3, ‘Invariance Testing’, and Section 4.2.4, ‘Common Method Bias’, highlight two issues of the adopted methodology and how they are approached in this project. Lastly, Section 4.2.5, ‘Experiment Component’, details how the experimental design is implemented in this study.

Subsequently, the data collection strategy and processes will be given in Section 4.4, ‘Data Collection’, includes seven sub-sections that detail the population and sampling of the study in Sections 4.4.1, ‘Relevant Population’, and 4.4.2, ‘Sampling Technique and Participant Selection’, respectively. Section 4.4.3, ‘Required Sample Size’, examines the size of the sample that is required for the study, while Section 4.4.4, ‘Questionnaire Design’, gives an overview of the survey instrument. The PSS case taken from the literature review chapter is operationalised in Section 4.4.5, “‘Fashion Subscription” Description’. Section 4.4.6, ‘Study Measures’, gives an overview of how constructs are measured, and Section 4.4.7, ‘Implementation of Research Ethics’ synthesises how research ethics matters were considered throughout the study.

Section 4.5, ‘Pilot Study’, describes the procedure used to test the survey instrument. Finally, the main points of the chapter are summarised in Section 4.6, ‘Chapter Output’.

4.2 Questionnaire-based Experiment

While the specifics of the data collection processes employed will be detailed later in this chapter, for now, it is necessary to specify which methodology this thesis adopts.

4. Research Design and Methodology

Based on the previously detailed considerations, this methodology will be a questionnaire-based experiment, which includes two components. The reflective questionnaire is the larger of these components and will be discussed first.

Survey-based research can be distinguished along a continuum based on the interactivity of its data-gathering method, beginning with face-to-face interviews, which are a form of qualitative survey, to self-administered questionnaires, which are commonly quantitative (Gubrium et al., 2012). Methods on the more interactive side allow for greater flexibility in terms of structure, and can explore new topics, which is also possible in self-administered questionnaires by having open text fields. In this project, flexibility to allow for exploration is not required, however, as a fully formulated theoretical framework has already been developed using the literature and, given the higher resource requirements and more problematic generalisation of interviews, a self-administered questionnaire has been chosen as a methodology (Ahlström, 2016).

This type of questionnaire then allows respondents to evaluate the hypothetical PSS according to the theoretical framework developed in the literature review chapter with less scope for researcher bias. Furthermore, it is noteworthy that the theoretical framework that this thesis seeks to investigate is reflective—the perceived value and risk constructs hypothesised are reflections of an individual's unique evaluation. As these constructs cannot be easily measured via single items, because of their diverse nature, this prohibits the application of a questionnaire using multiple regression methodology. In such cases, a methodology that has been widely applied in the marketing and OM disciplines is structural equation modelling (SEM), which is a hybrid methodology mixing factor analysis with multiple regression. Therefore, it allows for latent constructs or factors that are not reliably measurable using a single item to be approximated through multiple items. Multiple relationships between these latent constructs can then be estimated to a high degree of confidence (Byrne, 2016). As such, 'much of SEM's success can be attributed to the method's ability to evaluate the measurement of latent variables, while also testing relationships between latent variables (Babin et al., 2008)' (Hair et al., 2014).

4.2.1 Covariance-based SEM

An initial choice that must be made when using SEM for statistical analysis is whether to adopt the covariance-based (CB) approach or that based on partial least squares (PLS). Traditionally, CB-SEM has been utilised more often in business management research, but Hair et al. (2014) mapped the increasing use of PLS-SEM and determined that PLS-SEM may be a better option in three scenarios.

First, nonnormal data are less of an issue for PLS-SEM, as the nonnormal data is transformed by the PLS algorithm according to the central limit theorem (Cassel et al., 1999). However, highly skewed data can still reduce the statistical power of the analysis, as bootstrapping errors may become inflated, which impacts on the model parameters' significance (Hair et al., 2014).

Second, low sample sizes can affect parameter estimates, model fit, and statistical power in SEM (Shah & Goldstein, 2006). PLS-SEM is better equipped to deal with low sample sizes, although not to the extent that many researchers may believe. Hair et al. (2014) argue that reported sample sizes in PLS-SEM publications are often too low to yield reliable findings.

Third, PLS-SEM can also utilise formative indicators, as opposed to CB-SEM, which is better suited to only utilising reflective indicators (Hair et al., 2014). Formative indicators cause the latent construct, for example, by looking at the actual revenue and other metrics of a company, to create a performance construct, whereas reflective indicators are indicative of the construct, for example by asking managers to judge the performance of a company (Albers, 2010).

PLS' first two strengths ensure the method's suitability for developing theories in new contexts as there is little requirement to get guiding, even if not highly robust findings, and the latter in cases of formative indicators. CB-SEM is better for theory testing, however, as relationships between constructs can be estimated to a higher degree of precision (Hair et al., 2014).

In this research project, the goal is to test a theoretical model in which each component has previously been theorised. Data normality requirements may be expected to be satisfactory, as evaluations of PSS by previous respondents have been mixed, and sample size is not an issue in this case, since the sample frame is relatively wide. Also,

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no formative indicators are required. Based on this reasoning, a standard CB-SEM approach has been adopted using a maximum-likelihood (ML) estimation method.

The most widely used process, in this context, is Anderson and Gerbing's (1988) two-step method, which first assesses the goodness-of-fit (GOF) of the underlying measurement model via a confirmatory factor analysis (CFA), and, if model fit is acceptable, develops and analyses the structural model to test hypotheses. A precursory step that has become the norm is to also conduct an exploratory factor analysis (EFA).

While the EFA seeks to identify the number of factors that possibly explain the observed variables and assess the correct factor loadings of items, in the CFA the researcher specifies these factors and their variables as a complete model and observes fit indices that measure how well the data fit that model. The EFA, therefore, explores the data with fewer ex-ante assumptions, whereas the CFA specifies factors/constructs and their associated items.

During both EFA and CFA, it is necessary to test for construct reliability and validity to confirm that the questionnaire is measuring what it intends to measure without violating the theoretical assumptions underpinning it before moving onto the structural model analysis (Hair et al., 2010).

Reliability, or internal consistency, measures the correlations among variables that are supposed to measure an underlying construct. Should reliability be low, this would imply that items supposedly measuring the same construct are not interrelated. In this case, it must be assumed that the items do not measure the intended construct, but rather another most likely unknown sub-facet, or a different construct altogether. Reliability is commonly described by Cronbach's alpha scores—high correlations result in a high Cronbach's alpha score. A second indicator of internal consistency is composite reliability (Field, 2013).

Construct validity is separated into convergent and discriminant validity. Convergent validity refers to the degree of correlation among items within the same construct; consistently high loadings across items of the same construct increase confidence that these items do, in fact, aim at the same construct. Discriminant validity tests whether items that should not be related to each other are actually unrelated. Should items

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hypothesised to reflect two different constructs load together, this would imply that these items do not discriminate between the two hypothesised constructs (Field, 2013). To test for reliability, and convergent and discriminant validity, there are commonly applied cut-off points.

Beyond reliability and convergent and discriminant validity, multicollinearity occurs when independent variables are closely related – the closer, the more difficult it becomes to estimate regression coefficients as they each would work similarly well in predicting the dependent variable. This would then confound the regression (Field, 2013). As such, a final distribution assumption to test for is multicollinearity.

4.2.2 Assessing and Improving Model Fit

There are various indices for evaluating model fit, which depend on the sample, estimation method, and data distribution (Hu & Bentler, 1995). These indices are used to assess the extent to which the observed data match a hypothesised theoretical structure during CFA and structural model analysis. In practice, authors often report fit indices that support model fit and omit others that do not support model fit, but Garver and Mentzer (1999) state that at least one fit index of each family should be reported and attention should be paid to recommended thresholds.

Three basic types of index are typically scrutinised to assess model fit: Absolute Fit Indices (AFI), Incremental Fit Indices (IFI), and Parsimonious Fit Indices (PFI) (Byrne, 2016; Hair et al., 2010). In scholarship, the appropriate selection of model fit indices is debated; the most orthodox index employed has been the chi-square statistic, which, coupled with an insignificant p-value, shows that the difference between observed and estimated covariance matrices is small and indicate good model fit (Gefen et al., 2000). More recently the chi-square test has been used less, as it is highly sensitive to larger samples and more complex models; instead, chi-square divided by degrees of freedom is used to account for larger samples, resulting in the normed chi-square test (Kline, 2005).

Among the other AFIs, all of which indicate how well the data fits the model overall by looking at covariance and residual matrices, the goodness-of-fit index (GFI) and

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average goodness-of-fit index (AGFI) were critiqued early for being biased in the case of larger sample sizes, resulting in an inflated model fit (Hu & Bentler, 1998). Instead, the root mean square error of approximation (RMSEA) index circumvents the problem of sample size by looking at discrepancies between observed and predicted covariances, meaning that errors of approximation are analysed (i.e., the model's lack of fit to data) would parameters be chosen optimally, as opposed to errors of estimation as the GFI and AGFI, which are affected by sample sizes (Kline, 2005). It has also been claimed that the RMSEA is more capable than other fit indices of indicating the model's fit to the underlying population as opposed to the sample (Hair et al., 2010). Lastly, among the AFIs, the root mean square residual (RMR) is the mean absolute value of covariance residuals, which is converted into an interpretable index when standardised into the standardised root mean square residual (SRMR) index (Brown, 2006). By focusing on the residuals, it differs from the other AFIs, as it does not seek to establish a good or ideal fit, but rather to measure the 'badness of fit'. High values imply that residuals are large and that the model does not fit the data well (Kline, 2005).

Meanwhile, IFIs seek to establish whether the specified model is different from a null model (i.e. that all variables are uncorrelated [McDonald & Ho, 2002]), which is why these indices are incremental or comparative as they compare the existing model to the null. Here the comparative fit index (CFI) and Tucker-Lewis index (TLI) are commonly given.

The CFI compares the specified model fit to the fit of the null model, which assumes no correlation between observed variables, which is one of the most commonly cited indices, partially because it does not account for degrees of freedom, which results in typically high values (Hair et al., 2006). Meanwhile, Hu and Bentler (1998) recommend using the TLI, which shares similarities with CFI but adjusts for degrees of freedom and thus penalises overly complex models. While the TLI is based on the normed fit index (NFI), the NFI has been critiqued for being negatively biased (Bentler, 1990).

Finally, PFIs seek to establish whether the model only fits the data well because the model is overly complex, which would result in a better fitting, but theoretically less rigorous model because of lower parsimony. As such, 'these indices, therefore, seriously penalise for model complexity' (Hooper et al., 2008). PFIs are not always

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reported, but following Garver and Mentzer's (1999) advice, they are reported in this thesis as part of best practice according to Mulaik et al.'s (1989) guidance.

Table 4-1 reports relevant thresholds for the discussed fit indices.

Table 4-1: Overview of fit indices and acceptable thresholds.

	Fit indices	Threshold	References
Absolute fit indices	Chi-square	$p > 0.05$	Hair et al. (2010) Hu and Bentler (1995, 1998)
	DF	$p \geq 0$	
	Chi-square/DF	< 3	
	RMSEA	≤ 0.06	
	SRMR	≤ 0.08	
Incremental fit indices	CFI	≥ 0.95	
	TLI	≥ 0.95	
Parsimonious fit indices	PGFI	≥ 0.50	Mulaik et al. (1989)
	PNFI	≥ 0.50	

Should the model fit be poor, Hair et al. (2010) recommend several diagnostics that can be used to inform a specification search to improve model fit. These diagnostics are based on a post-hoc exploration of the model (MacCallum et al., 1992) by looking at path estimates (PEs), standardised residuals (SRs), and modification indices (MIs) that resulted in expected parameter changes (EPCs), as per Kaplan (1990).

First, it can be assessed to what extent observed variables load onto their respective constructs: loadings of below 0.5 indicate that the PE is caused more by error variance than explained variance. Loadings of 0.7 or higher are preferable (Hair et al., 2010).

Second, SRs can be scrutinised, which represent variances between observed covariance terms and estimated covariance terms. The smaller the residuals are, the better the data fit the model, and high SRs may be cause for concern and require the deletion of items, should model fit be exceptionally poor.

Third, MIs can be analysed, which represent recommendations about which possible relationships may exist that are currently not specified in a model. Should MIs be high

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(Whittaker (2012) gives >40 as a rule of thumb), the model fit will suffer, and errors between the variables associated with the MI may be used to represent these previously unspecified relationships and thus improve model fit (Hair et al., 2010). Several publications have critiqued this strategy for improving model fit as, should the correlated errors be random, then allowing them to covary is ‘taking advantage of random chance, thereby moving the researcher from confirmatory model testing to exploratory model testing’ (Hermida, 2015, p. 14). This is because, assuming that the error term in test theory is equivalent to random measurement error and imposing additional constraints on two error terms, violates the assumption of randomness; this would then mask another, non-random error source (Gerbing & Anderson, 1984). Gerbing and Anderson (1984, p. 579) quote Fornell (1983, p. 477) to stress that correlated measurement errors should only be fit if “(1) it is warranted on theoretical or methodological grounds, or (2) it does not significantly alter the structural parameter estimates” They furthermore quote Bagozzi (1983, p. 450) who adds “(3) unless it does not significantly alter the measurement parameter estimates”.

These three approaches will be followed in the case of poor model fit, keeping in mind the guidance given by Gerbing and Anderson (1984).

4.2.3 Invariance Testing

One more step that must be taken in this study in between the two steps proposed by Anderson and Gerbing (1988) is testing for invariance, which includes configural, measurement, and structural invariance following Byrne’s (2016) method of testing a series of increasingly constrained measurement models in *AMOS*. Invariance testing assesses the extent to which factors that may segment different populations change their underlying configural, measurement, and structural models, which would mean that these populations would have to be studied independently of each other. In this case, the factors that may segment the populations are the product information treatments. Therefore, if invariance is confirmed in this study, then the data of the experimental groups regardless of their product information treatment conditions can

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be analysed together during the structural model analysis as there are no significant configural, measurement, or structural differences between the groups.

Configural invariance refers to whether the general factor structure is similar across the groups by associating the same items with the same latent constructs. Should measures be associated with different latent constructs, there would be a lack of configural invariance as evidenced through poor model fit (Steenkamp & Baumgartner, 1998, p. 83). Configural invariance testing, therefore, includes the comparison of model fit indices for the compared groups with unconstrained factor loadings to those of the overall model. This type of lack of invariance is unlikely: product information treatments should not cause a cost value item to load onto the perceived environmental value construct, for example.

Measurement invariance thus refers to ‘whether or not, under different conditions of observing and studying phenomena, measurement operations yield the same attribute’ (Horn & McArdle, 1992, p117). In practice, this tests whether factor loadings are approximately similar across groups and is tested by constraining factor loadings to be equal and comparing model fit indices to those generated in the configural invariance test; if factor loadings were to be markedly different between groups this would decrease model fit. Here, observed between-group differences may be due to real attitudinal differences or because respondents react differently to the items due to psychometric factors, which introduces bias, or because ‘the very process of substantive interest (i.e., an intervention or experimental manipulation) alter the conceptual frame of reference against which a group responds to a measure’ (Vandenberg & Lance, 2000, p. 5). The question, in this case, therefore, is whether the presence or absence of additional product information caused bias in how individuals responded to items not in means, but in terms of the underlying measurement. For example, it may be that the administration of the cost product information alters the factor loadings of the perceived cost value items as the treatment alters the understanding of those items.

Finally, structural invariance means that covariances between latent constructs are equivalent for the two groups and an absence of equivalence of covariances would imply that respondents of the two groups associate different latent constructs with one another. Structural invariance is therefore tested by constraining the covariances across

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the groups and comparing model fit indices to those generated when testing measurement invariance (Vanderberg & Lance, 2010). It could be the case, for example, that the cost product information treatment means that respondents associate perceived cost value more strongly with purchase intention, as the information has reframed the choice context.

Please note that scalar and residual invariance (Putnick & Bornstein, 2016) tests have not been conducted, as Byrne (2016) claims that these are overly stringent tests that are only required if the used scales themselves are the focus of attention.

4.2.4 Common Method Bias in Surveys

Despite the heavy use of survey-based research methods across the social sciences, a variety of issues have emerged with their use, and one of these is common method bias (CMB). CMB is caused by a closely related concept, common method variance (CMV), which is ‘variance that is attributable to the measurement method rather than to the constructs the measures represent’ (Podsakoff et al., 2003, p. 879), with method defined as ‘the content of the items, the response format, the general instructions and other features of the test-task as a whole, the characteristics of the examiner, other features of the total setting, and the reason why the subject is taking the test’ (Fiske, 1982, p82, as quoted by Podsakoff et al., 2003).

MacKenzie and Podsakoff (2012) go into further detail here: if a latent construct captures systematic variances across measured items, the amount of systematic variance stemming from the method itself and the trait must be kept separate, as otherwise scale reliabilities may be erroneous. The danger here is that CMV creates internal consistency of factors where little such consistency exists as correlations among items are generated by their common source instead of other factors.

While the issue of CMB has been scrutinised in the literature on quantitative survey methodologies for decades, it has only relatively recently been addressed systematically in business management research. For the purpose of this project, the advice offered by Chang et al. (2010), Conway and Lance (2010), Fuller et al. (2015),

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MacKenzie and Podsakoff (2012), and Podsakoff et al. (2003) will be followed as the most referenced publications in the wider business management area.

Authors recently begun assessing in greater detail how CMV and CMB are introduced in self-reported survey data to prevent CMB, which appears to be mainly caused by respondents 'satisficing' and responding stylistically to items in a self-reported questionnaire (MacKenzie & Podsakoff, 2012). This means that both ability and motivation are required of respondents to provide answers free of CMB, and authors agree that preventing CMV and CMB at the questionnaire design stage is more feasible than post-hoc measures of correcting detected CMV and CMB (Conway & Lance, 2010; Fuller et al., 2015; MacKenzie & Podsakoff, 2012). As such, MacKenzie and Podsakoff's (2012) advice on preventing CMB through careful questionnaire design has been implemented as far as possible (see Appendix H, Table I-1, Table I-2 and Table I-3).

An initial problem encountered in post-hoc analysis and treatment of CMB is the reliable detection of CMB. This is commonly achieved using Harman's single-factor test—effectively an EFA in which each measured item is forced to load onto a single latent factor. The single latent factor, presumably the CMB, is then scrutinised as to whether it explains the majority of covariance in the measured items. While Harman's single-factor test has been critiqued (Podsakoff et al., 2003; Chang et al., 2010), more recent studies have found the test to be effective under normal conditions (Fuller et al., 2015). In terms of post-hoc fixes, once CMV and CMB have been detected Podsakoff et al. (2003) and Richardson et al. (2009) largely agree that none of them is free of theoretical or methodological issues, which is why Conway and Lance (2010, p. 331) state that 'we cannot recommend any of these [post-hoc] approaches'.

Going forward, Harman's single-factor test will be applied to the detection of CMB at the rule of thumb of >50% of total variance explained by the single latent factor being considered indicative of CMB. Should CMB be detected, this will impose a limitation on the interpretation of this study's results, as no post-hoc statistical correction procedure has emerged as feasible or reliable, according to the literature.

4.2.5 Experiment Component

Experiments are ‘a test or a series of tests in which purposeful changes are made to the input variable of a process or system so that we may observe and identify the reasons for changes that may be observed in the output response’ (Montgomery, 2009, p. 1). Given that the literature review has identified that additional product information should assure consumers of perceived values or alleviate perceived risks during PSS adoption, these ‘purposeful changes’ will be made to control the amount of product information that respondents have during the evaluation of the PSS.

Three principles in randomisation, replication, and blocking underpin experimental designs (Campbell & Stanley, 2015). In the social sciences, randomisation refers to the allocation and order of treatments administered to individuals, replication refers to the study being described in sufficient detail to be replicable with each observation relating to a separate and independent measurement, and blocking means that potentially confounding factors are eliminated by grouping individuals in groups (or blocks) via control variables. To conduct experiments in practice, Montgomery (2009, p. 14) recommends the following guidelines:

- 1) Recognition of and statement of the problem
- 2) Selection of the response variable
- 3) Choice of factors and levels
- 4) Choice of experimental design
- 5) Performance of the experiment
- 6) Statistical analysis of the data
- 7) Conclusions and recommendations

Points 1) and 2) have been addressed at the stages of the research question and theoretical framework, as it is known which constructs the product information treatments are expected to impact and will be further specified in the data collection section by providing the used measures. Point 5) will also be described in the data collection section when the experiment is described. Similarly, points 6) and 7) will be addressed in the results and discussion chapters, respectively, although an outline

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will also be provided here indicating which statistical analysis will be applied. This leaves points 3), 4), and parts of 6) to address.

Choice of Factors and Levels

Four different types of product information have been hypothesised about in the literature review chapter, indicating the presence of four factors. Factors may vary in terms of their level, and each additional level greatly increases the required sample size. It has therefore been decided to have two levels, which means that product information treatments are either administered (denoted as (1)), or not administered (denoted as (-1)), which means that respondents will either receive the additional product information or not. It may have been possible to include more levels, for example a low, medium, and high amount of product information. The decision to apply only two levels was aimed at keeping the required sample size manageable given the resource constraints of this study. This will be reflected on in the section on limitations and future research in the thesis' concluding chapter.

Choice of Experimental Design

This means that four factors with two levels each are investigated, making the experimental design a 2^4 design, meaning that 16 experimental groups are required to analyse all possible relationships ($2^4 = 16$). To illustrate the impact of levels on sample size, should another level be added, forming a 3^4 design, 48 groups are necessary to adequately account for effects ($3^4 = 48$). The distribution of the groups and their product information treatments are shown in Table 4-2 below.

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Table 4-2: Experimental groups and their product information treatments (lack of treatments have been greyed out for easier readability).

	Cost product information	Environmental product information	Preference product information	Physical condition product information
Group 1	(-1)	(-1)	(-1)	(-1)
Group 2	(1)	(-1)	(-1)	(-1)
Group 3	(-1)	(1)	(-1)	(-1)
Group 4	(-1)	(-1)	(1)	-1
Group 5	(-1)	(-1)	(-1)	(1)
Group 6	(1)	(1)	(-1)	(-1)
Group 7	(1)	(-1)	(1)	(-1)
Group 8	(1)	(-1)	(-1)	1
Group 9	(-1)	(1)	(1)	(-1)
Group 10	(-1)	(1)	(-1)	(1)
Group 11	(-1)	(-1)	(1)	(1)
Group 12	(-1)	(1)	(1)	(1)
Group 13	(1)	(-1)	(1)	(1)
Group 14	(1)	(1)	(-1)	(1)
Group 15	(1)	(1)	(1)	(-1)
Group 16	(1)	(1)	(1)	(1)

Table 4-2 shows that, for example, Group 1 will receive none of the product information, while Group 12 will receive all product information except for the cost one. This full-factorial design minimises the sample size requirements because it allows for the full sample to be split into two equally sized groups along the four product information treatments (Montgomery, 2009). For example, if one is interested in the effect of the cost product information, it is possible to compare eight experimental groups (1, 3, 4, 5, 8, 9, 10, 11, 12—i.e., the groups without cost product information) against another eight experimental groups (2, 6, 7, 13, 14, 15, 16—i.e., the groups with cost product information), resulting in two equally sized groupings with equivalent conditions in the other product information treatments. Any statistically significant difference between those two groupings must then be due to the presence or absence of the cost product information treatment (assuming that

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measurement invariance has been established and control variables implemented). Should each individual product information treatment condition have a full unique grouping associated, this would increase the sample size significantly. As will be explained later in this chapter, for the purpose of invariance testing each grouping to be compared requires about 250 observations—this would then mean that there would 1,000 observations (four groups of 250 with each product information treatment) plus a control group of 250 (without additional product information). Instead, the full-factorial design reduces the sample size to 500, as each of the two possible groupings to be compared during invariance testing is embedded in the 16 experimental groups shown in Table 4-8.

Respondents will, therefore, be randomly allocated to a product information treatment condition, taking into account trust in the PSS provider as a potential confounding variable. The same proportion of high- and low-trusting respondents will be allocated to each of the 16 experimental groups.

Statistical Analysis of the Data

While experimental designs are often analysed using (Multiple) Analysis of Variance approaches (ANOVA and MANOVA), in this research project a series of independent-samples t-tests was sufficient to assess the effects of the product information treatment on their respective constructs. T-tests are a specific type of ANOVA, in that they also compare the means of continuous variables of populations and whether any difference is statistically significant, but t-tests are limited to two populations (Fields, 2013). As such, the null hypothesis of the t-test is that the difference in means is equal to zero.

In the case of a full-factorial design, each presence or absence of the treatment condition can be compared against each other as described previously. For example, the effect of the cost product information on the perceived cost value can be estimated by comparing the means of those factor scores for the grouping lacking that product information against the grouping that has that product information.

To apply an independent samples t-test, six assumptions must be given (Fields, 2013):

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1. Single continuous dependent variable
2. Single categorical independent variable with two levels, which divides the sample into two groups
3. Independence of observations, which means that individuals cannot belong to both groups
4. Absence of significant outliers and influentials
5. Dependent variable is approximately normally distributed for each of the two groups
6. Homogeneity of variances is assumed

To meet the first assumption, the items representing each construct will be imputed into a single composite factor score in *AMOS* after the CFA. While the items measured by a Likert scale are, strictly speaking, measured ordinally (although commonly treated as continuous), composite factor scores are continuous.

The second and third assumptions are given due to the study design, in which individuals were randomly allocated to either receive or not receive product information, and that these two conditions are mutually exclusive while having almost identical sample sizes.

The fourth and fifth assumptions will be tested by visually analysing Q-Q plots for deviation from normality, which may be caused by outliers and influentials. Here, it was considered to use Kolmogorov-Smirnov's or Shapiro-Wilk's normality tests. However, it has been shown that these tests tend to be overly sensitive for larger sample sizes (i.e., beyond 100 or 50, respectively). Examinations of standard deviations and Q-Q plots are, therefore, more conclusive in assessing normality in such cases (Howell, 2012). Furthermore, t-tests have been described as robust against violations of normality (De Winter, 2013; Field, 2013).

Finally, the homogeneity of variances was assessed using Levene's Test for Equality of Variances.

4.3 Data Collection

In this section, the data collection process will be further detailed by defining the relevant population, the sampling logic and sample size, the questionnaire design, the PSS description and product information treatments, the used measures, and the implementation of research ethics.

4.3.1 Relevant Population

The discussion of the existing literature has shown that consumer adoption of PSS, such as the fashion subscription, may be expected to be initially low, meaning that it would be most worthwhile to investigate which factors increase purchase intention among the most likely group of consumers, who, in the case of fashion, also have a disproportionately high environmental impact.

Following this principle, previous research on fashion has focused on the role of young women in developed countries, who consume a disproportionately high quantity of fashion items in comparison to other demographic groups as part of the ‘fast fashion’ pattern of consumption, characterised by shorter product lifecycles due to fast changes in style, low durability, and low price and the associated harmful effects on the environment at large (Armstrong et al., 2015). Offering more environmental options to this consumer group would result in the largest benefits for the environment, and lower use costs and greater diversity in clothing being attractive to this consumer group, making it the most likely group of early adopters.

Armstrong et al.’s (2015) study was conducted among a sample of Finnish women, and one finding was that younger consumers were more interested in innovative, result-oriented PSS. This finding was applied here, and it is argued that Finnish and British consumption patterns are sufficiently similar for this finding be transferred to the British context. The relevant population is therefore given as British women between the ages of 18 and 39 with an existing propensity to buy fashion products online.

4.3.2 Sampling Technique and Participant Selection

The sampling technique employed may be classified as voluntary sampling, as participants decided to participate in the study by opting into it as part of a panel. The panel was organised by Prolific, which is an internet-based platform on which researchers can upload questionnaires for a pool of respondents to complete. Similar to the Qualtrics panel or the Amazon Mechanical Turk (AMT) also frequently employed in research with consumers, respondents are compensated for their participation on Prolific.

However, AMT only features a small pool of potential respondents matching the population on which this study focuses (Ipeirotis, 2010), and given that verifying demographic data of workers on AMT is difficult, this weakens the case for choosing AMT. The Qualtrics panel could have drawn on a sufficient pool of respondents matching the population but was dismissed because of a prohibitively high study cost. A student sample was also considered as a less cost-intensive option, which could also increase the internal validity of the findings as female HE students may be expected to be more homogenous in terms of income, age, and educational background. This would decrease the external validity, however, and recent studies have been criticised for using student samples that cannot be argued to be representative of the populations they seek to study (see Rapp and Hill's (2015) review of the *Journal of Consumer Research*). Furthermore, the implementation of pre-screening questions would have resulted in a lengthy data collection process using a student sample supported by a paper-based questionnaire.

These pre-screening questions were included to ensure that the sample matched the population of interest. Prolific's built-in battery of pre-screening questions that panel members answer when becoming a member included question on the participant's a) sex, b) age, and c) country-level location, enabling the researcher to ensure that only female Prolific panel members aged 18–39 and based in the UK would have access to the study. A fourth pre-screening question was added to Prolific's existing ones on behalf of the researcher, which asked how often respondents purchase clothing items online. Only respondents who purchase items once a month or more were included in the study (see Appendix A, Figure A-1). This pre-screening item was included to

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ensure that study respondents have existing interest and experience in buying clothing online, excluding respondents who do not want to or lack the resources to do so.

Another pre-screening item was considered to be focused more specifically on the volume of fashion purchases as per the fast-fashion consumption pattern to ensure that only such consumers would take part in the study. However, while researchers such as Armstrong et al. (2015) are hopeful that new fashion consumption paradigms, such as the hypothetical PSS, can be attractive to members of the fast-fashion consumer group, this does not mean that they are or should be exclusive to this consumer group.

A last pre-screening item that was considered was consumption experience of or knowledge about PSS similar to the fashion subscription. The rationale was that if a participant had prior knowledge or pre-existing attitudes about such products, this would impact on the evaluation of the hypothetical PSS, confounding the effect of the product information treatments. However, the investigator has not been able to identify any similar product currently or previously on offer in the UK. There are offers that sell sets of items to consumers on a monthly basis, which have enjoyed limited success in the UK. However, these offers do not touch upon the lack of newness and ownership features of the fashion subscription analysed here, which eliminated the need for a further pre-screening question.

4.3.3 Required Sample Size

The analyses that will be performed on the collected data based on the research methodology are CB-SEM and a series of t-tests. T-tests have been claimed to work with relatively small sample sizes depending on the strength of the effect (De Winter, 2013; Fields, 2013). Based on this and the experimental design resulting in evenly sized populations for the t-test, the necessary sample size for the t-tests is below the sample size requirements for CB-SEM (Hair et al., 2010). Therefore, determining the sample size based on the requirements of CB-SEM is more feasible.

In CB-SEM, adequate sample sizes are a point of contestation even though there are some rules of thumb that are commonly used. These frequently involve guidelines on how many observations are needed per freely estimated parameter in the CFA, ranging

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from three to ten (Kline, 2011, p11), to more general assertions that at least 200 observations are necessary (e.g. Crisci, 2012; Hoe, 2008). Simulations have shown that the exact minimum sample size depends on the number of factors and measured variables as well as their loadings, the distribution of the data, and the model complexity overall (e.g. Sideridis et al., 2014; Wolf et al., 2013). Overall, given that Anderson and Gerbing's (1988) two-step approach to CB-SEM and the use a ML method has become the norm, the impetus has been to select larger sample sizes to aid in initial factor recovery and provide more statistical power when assessing model fit.

The investigated model does not include mediation or moderation relationships, which would increase model complexity and thus the required sample size significantly (Sideridis et al., 2014). Also, each construct features or three or four observed variables. Missing data was not assumed to be frequent due to the data being gathered through a panel, which would also require a larger sample size (Wolf et al., 2013). Furthermore, a glance at published studies in this field shows that, even with relatively complex models, researchers tend to gather between 200 and 400 responses per model (e.g., Hellier et al., 2003; He & Li, 2010). Based on this reasoning, it was decided to aim for a sample size of 250 responses after data cleaning.

However, given that invariance must be established prior to analysing the model through group comparison between those who received and did not receive the product information treatments, this increased the sample size to at least 500 observations (250 for each compared group as per the full-factorial experimental design). To keep distributions equal among the experimental groups and account for potentially missing data or unengaged responses, the targeted sample size was chosen to be 528 responses, or 33 responses per individual experimental group.

4.3.4 Questionnaire Design

The design of the final questionnaire beyond the pre-screening questions elaborated earlier followed a relatively complex structure and utilised the feeding through of information and branched survey flow logic using Qualtrics. After opting-in to the study by reading and continuing on a screen displaying general information about the

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study, an initial section introduced the study briefly and referred to a participant information leaflet (PIL).

The PIL was set up as a hyperlink to the relevant PDF for participants to view and download to ensure that participants were familiar with the information provided in the document on study benefits, information on the investigator, etc. Afterwards, a text field was provided to allow respondents to enter their Prolific ID. This Prolific ID is a requirement of Prolific so that respondents may be identified as having completed the study upon completion and are eligible for compensation. Prolific IDs are random series of numbers and letters and do not allow for the identification or contact of individual respondents. Next, a text field was provided to allow respondents to name the online fashion retailer or platform from which they most frequently buy fashion items online (see Appendix A, Figure A-1). The response to this text field was fed through the remainder of this study as the company offering the fictional PSS.

Afterwards, several items on participants' trust in the previously named fashion retailer were included, which will be specified in the section on measures—these were shown in order and not randomised. One item pertaining to the overall level of trust in the fashion retailer was, however, used as a control variable in the study. As such, participants were divided into the 16 experimental groups under consideration of this trust variable, resulting in an even distribution of individuals with different levels of trust in their most frequented online fashion retailer across the 16 experimental groups.

Afterwards, the basic information on the hypothetical PSS was provided to all participants, regardless of experimental group allocation. Subsequently, according to their allocation to different groups, respondents received additional product information as per their experimental group.

Next, all participants were presented with items on perceived value and risk, which were shown grouped but in a randomised order in terms of their appearance and their individual items. Purchase intention was shown afterwards, also with the items in randomised order.

Finally, participants were asked to provide demographic information. Because of the sensitivity of such information, only items that were already in Prolific's existing

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repertoire and whose effect could have reasonably been assumed to be impactful for this research were used.

A brief message was shown to the respondents upon completion, with a prompt telling them to return to the Prolific page to enter the completion code so that they would receive compensation.

Throughout the questionnaire, no responses were mandatory, except for the provision of the Prolific ID, which was necessary to ensure compensation for the participants, and the overall trust item measure that was used as a control variable to create the experimental groups. For perceived value, risk, and purchase intention, responses were requested so that participants had the option of skipping items if they wished to do so.

4.3.5 ‘Fashion Subscription’ Description

The PSS description followed on from the ‘fashion subscription’ described in the literature review. It was selected to describe the PSS similar to REXFELT and HIORT AF ORNÄS (2009) by focusing on how it works through a textual description. Overly specific information was avoided so that it remained applicable to all of the participants’ most frequented online fashion retailer brands (i.e., not showing or describing specific items of clothing and not specifying prices). The inclusion of specific items or prices would have facilitated measurement of willingness-to-pay or more definite purchase-intention measures, but this would have required that a pre-determined exemplary fashion item be offered by a pre-determined brand selling that item, adding confounding factors. Feeding the respondents’ most frequented online fashion retailer brand into the relatively generic description thus allowed the respondent to mentally fill in the relevant information.

Another reason for holding the text brief was to prevent respondent fatigue and allow for easier memory recall going forward in the evaluation. This was reinforced with a request to engage with the text in more detail by pointing out its importance for the study. Similarly, the wording was iteratively discussed with colleagues in the author’s research group for language and meaning and subsequently improved. Thus, the offer was consistently described as a ‘fashion subscription’, and the specifics of the item

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returns were summarised in a ‘monthly return policy’ (distinct from a common return policy the brand might have). These terms were subsequently also embedded in the study measures. Please refer to Appendix A, Figure A-2 for the full description. Based on feedback from the author’s research group, the description was also supplemented with a figure showing the general functioning of the business to aid understanding (see Appendix A, Figure A-3).

The four product information treatments were designed as short single paragraph statements with similar language and structure. As such, each treatment was introduced with a claim about the offer by the provider addressing either a potential source of perceived value or risk, followed up with an explanation as to why that claim is believable or how it is operationally implemented (see Appendix A, Table A-1). No additional product information was shown to respondents of the experimental group 1.

4.3.6 Study Measures

Measures used in this study were directly adopted or adapted to varying degrees from previously published studies; this section will present these and provide justifications for their choice and adaptation. Unless otherwise indicated, items were measured on 7-point Likert scales ranging from ‘Strongly disagree’ (1) to ‘Strongly agree’ (7).

Trust Measures

After naming their most frequented online fashion retailer as described above, respondents were subsequently asked to evaluate that brand using Gefen’s (2002) consumer trust in eCommerce brands scale featuring three constructs, measured by three items each on a) integrity (adherence to appropriate and accepted rules of conduct), b) benevolence (the desire to do right by the customer), and c) ability (possession of the appropriate skills and competence to conduct transactions) (see Table 4-3).

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Table 4-3: Trust items used as a primer.

Construct	Item name	Item
Integrity	TrustInt1	Promises made by [Company] are likely to be reliable.
	TrustInt2	I do not doubt the honesty of [Company].
	TrustInt3	I expect that the advice given by [Company] is their best judgement.
Benevolence	TrustBen1	I expect that [Company] have good intentions towards me.
	TrustBen2	I expect that [Company]'s intentions are benevolent.
	TrustBen3	I expect that [Company] are well meaning.
Ability	TrustAbi1	[Company] understands the market they work in.
	TrustAbi2	[Company] knows about online fashion retailing.
	TrustAbi3	[Company] knows how to provide excellent service.

Gefen's (2002) scale was used as a primer for Chaudhuri and Holbrook's (2001) item 'I trust this brand', which was used as the control variable to ensure the uniform distribution of participants across the 16 experimental groups. As such, responses to Gefen's (2002) scale were not used in subsequent analysis, but only to elicit a more considered response to Chaudhuri and Holbrook's (2001) item, given that Gefen's (2002) is, to the author's knowledge, the only scale that distinguishes between different trust dimensions specifically in the eCommerce context. To obscure the importance of the single overall trust item somewhat, this item was shown together with the other three overall trust scale items used by Chaudhuri and Holbrook (2001) (see Table 4-4).

Table 4-4: Trust items with TrustOver1 as the control variable.

Construct	Item name	Item
Overall trust	TrustOver1	I trust this brand.
	TrustOver2	I rely on this brand.
	TrustOver3	This is an honest brand.
	TrustOver4	This brand is safe.

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Perceived Value Measures

Identifying measures for the perceived value and perceived risk constructs hypothesised about in the theoretical framework was not a straightforward process, which may be partially attributed to the specificity of the relevant constructs uncovered, as well as their newness. Given that this research quantitatively enquires into a field that has primarily been researched using qualitative methods hitherto, the results of these qualitative findings were reflected in the study measures, as is common in the field (e.g., Wang et al., 2013). While it was possible to use existing scales for some of the constructs, for others it was necessary to adapt and modify items.

During this process, Sweeney and Soutar's (2001) perceived value (PERVAL) scale and Petrick's (2002) service value (SERVAL) scale, which have both found widespread application in consumer and marketing research, were used as guidelines for the perceived value constructs.

The PERVAL scale measures consumer-perceived value in terms of quality, emotional value, price, and social value, using six, five, four, and four items, respectively. This scale was, however, developed and applied to physical product artefacts, which is reflected in the wording of the items and the assumptions about the constructs themselves. As such, the scale lacks the fit with the context to be used with adaption, although individual items and parts of the logic have been applied, as will be shown below.

Similarly, the SERVAL scale by Petrick (2002) measures consumer perceived value of a service through the constructs of quality, emotional response, monetary price, behavioural price, and reputation using four, five, six, five, and five items each. Here some constructs come closer to those applicable in this case but, overall, the constructs are aligned to the measurement of pure services with no physical product component at all.

For this reason, the scales have been adapted according to the purpose of this study as outlined below. Byrne's (2016) advice on measuring each construct with three to four items for the purpose of reliable factor recovery was followed. Another consideration that was embedded in these items was that the perceived values of the fashion

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subscription could be compared with the conventional consumption pattern of buying clothes, whereas perceived risks are new and unique to the fashion subscription (Rexfelt & Hiort af Ornäs, 2009). Table 4-5 below reports how the perceived value constructs have been measured in this study on a 7-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’.

Table 4-5: Items used to measure perceived values.

Construct	Item/Item name	Author
Perceived cost value	Compared to buying new clothes, using [Company]'s fashion subscription would be economical for me. (ValCos_1)	Sweeney and Soutar, 2001
	In comparison to buying new clothes, the fashion subscription by [Company] would offer me better value for money. (ValCos_2)	Sweeney and Soutar, 2001
	Using [Company]'s fashion subscription would lower my fashion expenses compared to buying new clothes. (ValCost_3)	Wang and Hazen, 2016
	Compared with buying new clothes, [Company]'s fashion subscription offers me opportunities to save money. (ValCos_4)	Kim et al., 2008
Perceived variety value	In comparison to buying new clothes myself, [Company]'s fashion subscription would give me access to a greater variety of clothing. (ValVar_1)	Based on Sweeney and Soutar, 2001,
	Using [Company]'s fashion subscription would allow me to change what I wear more often than if I would buy new clothes. (ValVar_2)	Kahn and Wansink, 2004,
	The clothing variety provided to me by [Company]'s fashion subscription would be higher than if I would buy new clothes myself. (ValVar_3)	and Sylvester et al., 2014
	[Company]'s fashion subscription would allow me to wear different clothes more often than if I bought new clothes. (ValVar_4)	
Perceived environmental value	In comparison to buying new clothes, using [Company]'s fashion subscription would lead to natural resource and energy savings. (ValEnv_1)	Wang et al., 2013
	Using [Company]'s fashion subscription would reduce harmful effects to the environment in comparison to buying new clothes. (ValEnv_2)	Wang et al., 2013

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Using [Company]’s fashion subscription would have a better environmental performance than buying new clothes. (ValEnv_3)	Chen and Chang, 2013
Compared with buying new clothes, using [Company]’s fashion subscription would reduce overall natural resource and energy consumption. (ValEnv_4)	Chen and Chang, 2013

Perceived Risk Measures

The perceived risk measures were adapted from Featherman and Pavlou’s (2003) work on consumer-perceived risk in the case of an electronic payment system. The scale measures financial, performance, privacy, psychological, social, time, and overall risk using five, three, two, two, four, and five items, respectively. The direct use of parts of this scale was considered, but the scale measures the types of risk that emerge from an offer, and not where in the offer itself these risks originate from. The actual constructs of interest taken from the PSS literature are thus not present in the scale, and it thus does not offer enough granularity for the purpose of this study. However, the general structure and wording of Featherman and Pavlou’s (2003) items, as well as those of Stone and Gronhaug (1993), who had done earlier work on measuring perceived risk, was utilised. In addition to this, Cox and Cox’s (2001) measures on the perceived risk of choosing a product were also considered: ‘Getting a [product] is risky’, ‘[Product] can lead to bad results’, ‘[Products] have uncertain outcomes’, ‘Getting a [product] makes me feel anxious’, and ‘Getting a [product] would cause me to worry’. Featuring comparable wording to Featherman and Pavlou’s (2003) scale, the same nexus of worry, anxiety, and uncertainty caused by perceived risk has been embedded in the following measures as shown in Table 4-6 below, which were also measured on a 7-point Likert scale.

Table 4-6: Items used to measure perceived risks.

Construct	Item/Item name	Author
Perceived physical condition risk	I am afraid that the clothing items received through [Company]’s fashion subscription would be damaged or dirty. (RisCon_1)	Featherman and Pavlou, 2003, Wang et al.,

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	I worry that the clothing items delivered to me by [Company] as part of a fashion subscription would be in poor condition. (RisCon_2)	2013, Wang and Hazen, 2016
	I am afraid that the physical condition of the clothing items received through [Company]'s fashion subscription would not meet my expectations. (RisCon_3)	
	I am worried that the clothing items delivered to me as part of [Company]'s subscription would be damaged or unhygienic. (RisCon_4)	
Perceived preference risk	I am afraid that the clothing items received through [Company]'s fashion subscription would not meet my fashion style. (RisPre_1)	Featherman and Pavlou, 2003, Wang et al., 2013, Wang and Hazen, 2016
	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_2)	
	I worry that [Company] would deliver clothing items that do not look good on me if I used their fashion subscription. (RisPre_3)	
	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. (RisPre_4)	
Perceived shopping opportunities risk	I worry that if I use [Company]'s fashion subscription I would regret having fewer occasions to shop for new clothes. (RisSO_1)	Featherman and Pavlou, 2003, Armstrong et al., 2015, Babin et al., 1994
	I am afraid that I would miss the joy of hunting for new clothes if I use [Company]'s fashion subscription. (RisSO_2)	
	I am worried that having fewer reasons to go shopping for new clothes would feel like a loss to me if I used [Company]'s fashion subscription. (RisSO_3)	
	I am afraid that I would miss the fun of shopping for new clothes if I used [Company]'s fashion subscription. (RisSO_4)	
Perceived return sacrifice risk	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_1)	Featherman and Pavlou, 2003, Armstrong et al., 2015, Catulli and Reed, 2017
	I worry that returning the received clothing items would make me feel unhappy if I use [Company]'s fashion subscription. (RisRS_2)	
	I am afraid that returning the clothing items received by [Company] as part of a fashion subscription would make me feel regret. (RisRS_3)	

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		I am worried that it would make me feel sad returning the clothing items received by [Company] as part of a fashion subscription. (RisRS_4)	
Perceived liability risk	return	I worry that the monthly return policy of [Company] would cause me problems when using their fashion subscription. (RisRL_1)	Featherman and Pavlou, 2003, Cox and Cox, 2001
		The monthly return policy of [Company] would be a source of worry for me when using their fashion subscription. (RisRL_2)	
		I am afraid that [Company]'s monthly return policy would make me feel anxious when using their fashion subscription. (RisRL_3)	
		I am afraid that the monthly return policy would feel like a risk for me when using [Company]'s fashion subscription. (RisRL_4)	

Purchase Intention

Purchase intention was measured using Burton et al.'s (1999) three-item scale on the likelihood of purchase given a certain amount of information that a consumer has received about a product (see Table 4-7). The replacement or supplementation of this scale with items from closely related purchase intention scales was considered, e.g., Dodds et al.'s (1991) willingness-to-buy or Kim and Chung's (2011) purchase intention scales, which have seen more use. However, these scales seem more appropriate for judging the purchase intention of a defined (most likely physical) item with more definite properties (the scales were used in the context of branded electronics and shampoo respectively, with respondents being shown specific product-related information and prices). Similarly, Maxham III and Netemeyer's (2002) scale is more adequate for looking at a definite product offered by different brands with respondents judging the likelihood of buying from a particular brand. By contrast, Burton et al.'s (1999) scale was explicitly developed and used to measure purchase intention given a certain amount of information on an unfamiliar product, which aligns more closely to this study.

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Table 4-7: Items used to measure purchase intention.

Construct	Item/Item name	Author
Purchase intention	Would you be more likely or less likely to purchase a fashion subscription by [Company], given the information shown? (PI_1)	Burton et al., 1999
	Given the information shown, how probable is it that you would purchase a fashion subscription by [Company]? (PI_2)	
	How likely would you be to purchase a fashion subscription by [Company], given the information shown? (PI_3)	

Responses were measured on a 7-point Likert scale with different scale endpoints for each of the three items, but with only the response options in between numbered. The endpoints were ‘1-less likely’ to ‘7-more likely’, ‘1-not probable’ to ‘7-very probable’, and ‘1-very unlikely’ to ‘7-very likely’, respectively, as per Burton et al. (1999).

Demographics

Only demographic information that was also mentioned by researchers in the context of PSS adoption was measured as research ethics’ best practice stipulates not to gather demographic data without reason. Therefore, age, educational achievements, and household income data were collected. All of the demographic data was gathered using Prolific’s own demographic items. This decision was made because the items had been developed specifically for the British context and, given that the respondents had already answered Prolific’s demographic battery when they became panel members, it was assumed that use of the same items minimised intrusiveness. All items included a ‘would rather not say’ option.

4.3.7 Implementation of Research Ethics

Ethical considerations have been addressed throughout this section where appropriate; in particular, informed consent was ensured by providing a PIL (see Appendix B, Figure B-1, Figure B-2 and Figure B-3). In the PIL, the study was described to the

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potential respondents in greater detail, including the study's purpose and funding, their right to withdraw, and matters of compensation, confidentiality, and data anonymisation. Each respondent had the opportunity to view and download the PIL prior to participation and was encouraged to do so; it was assumed that continued participation in the study constituted informed consent.

Participant confidentiality was ensured by Prolific as the panel recruiting the participants, and by Qualtrics as the host of the experiment survey. While Prolific assigns a Prolific ID to individual participants for administration and compensation purposes and Qualtrics assigns numbers to respondents, no identifiable information, such as names, addresses, email addresses, or other information that could be used to identify or contact the participants, was gathered.

Participant compensation was determined by the time it would take a respondent to complete the questionnaire. The final questionnaire was estimated by Qualtrics as taking about 18 minutes to complete. Following this, compensation was calculated as 18 minutes using the UK National Living Wage for over 25-year-olds, which was £7.83 per hour at the time of this study, resulting in £2.35, which was increased to £2.75 to allow for the participants' consideration of the PIL.

Ethical approval from the University of Warwick's BSREC Research Ethics Sub-Committee was therefore granted to this study under the reference number REGO-2018-2183 on the 4th of April, 2018 (see Appendix B, Figures B-4 and B-5).

4.4 Pilot Study

While the survey measures were derived from existing scale formats and adapted using insight from several other publications that have been conducted in similar contexts, a pilot study was conducted to validate the measures. This pilot study took the form of an EFA to validate whether the data were sufficiently normally distributed to be used in SEM, and to assess reliability and convergent and discriminant validity (Byrne, 2016).

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There exist a variety of rules of thumb on adequate sample sizes for pilot studies, which, in this case, are rules of thumb on EFA sample sizes. These commonly take the form of specifying the number of cases per measured variable and recommendations vary widely. For the pilot test, De Winter et al.'s (2009) findings were followed, who conducted a simulation to estimate the required sample sizes to result in a) specified, reliable factor recovery, given b) a number of factors, and c) a number of variables.

The survey measures in this study measured nine constructs (or factors) using 35 variables. A conservative estimate was made that these variables' factor loadings would be 0.6. According to this assumption, the closest match in De Winter et al.'s (2009) findings, assuming factor loadings of 0.6, was eight factors measured using 24 variables, which could be reliably recovered with a minimum sample size of 179 observations. Another match, also at 0.6 factor loadings, featured eight factors measured with 48 variables, which required a sample size of 156. Since more factors need to be recovered in this study, and considering that one factor features only three items, it was decided to gather 198 observations to allow for some missing data or unengaged responses.

Given that pilot studies are more reliable when conducted under realistic conditions (Fields, 2013), the pilot study was conducted on *Prolific* using the same pre-screening questions and compensation as proposed for the actual study. The same wording for the hypothetical PSS and the same experimental design was used, resulting in data on the first six experimental groups being gathered, using their respective product information treatments as explained above. The decision to gather 'complete' data on the first six experimental groups, instead of spreading the 198 responses across all 16 groups, was that it was assumed that factor recovery for those first six groups with a lower amount of information would be more difficult than for the latter ten. This is because the latter ten groups received more information through the additional treatments and may have found it easier to reliably evaluate the product. Therefore, if factor recovery were acceptable for these six more problematic groups, the instrument would be sufficiently robust.

4.5 Chapter Output

This chapter has defined and justified the research methodology and its associated methods. The main findings of this chapter are listed in the following:

- CB-SEM is adopted to test the front-end of the theoretical model, and common pitfalls in a lack of invariance and the potential presence of CMB were addressed as far as possible.
- A series of t-tests are adopted to test the back-end of the theoretical model.
- Data collection decisions and procedures are detailed, with sampling and study measures deliberately chosen and described to investigate the theoretical framework with greater validity and replicability.
- A pilot study is proposed to test the study measures.

5. Results

5.1 Chapter Introduction

This results chapter is split into six sections.

After this introductory section, Section 5.2, ‘Pilot Study Exploratory Results’, analyses the data gathered for the pilot study, with sub-sections on data screening and EFA. The results of the EFA show that the survey instrument needs no alteration, which is why a second set of data was gathered. This second dataset is analysed in Section 5.3, ‘Follow-up Study Exploratory Results’, divided into similar sub-sections. An additional sub-section (5.3.4, ‘Comparison of Pilot Study and Follow-up Study Data’) argues that both datasets are similar, which is why they are combined in the further analysis. It is shown that both datasets were gathered using the same survey instrument under similar circumstances, show similar results, and represent the same population to justify this decision. Section 5.4, ‘Combined Exploratory Results’ reports on this combined dataset, starting with Sections 5.4.1, ‘Sample Demographics’, and 5.4.2, ‘Exploratory Factor Analysis’.

Section 5.5, ‘Model Analysis’ shows the results of the CFA in Section 5.5.1, ‘CFA Model Fit Results’ and addresses measurement in Section 5.5.2, ‘Reliability and Validity Assessment’. This is followed by sub-sections 5.5.3, ‘Invariance Testing’ and 5.5.4, ‘Multicollinearity Assessment’, which conduct invariance and multicollinearity tests. The structural model results relating to the predictors of purchase intention are given afterwards in Section 5.5.5, ‘Structural Model Analysis’. The effects of the product information on their relevant constructs are shown in Section 5.6, ‘Direct Effect Analysis’ in four separate sub-sections on the individual product information treatments.

Finally, Section 5.7, ‘Chapter Output’ synthesises the chapter’s findings.

Excel was used for data screening and cleaning, *SPSS Version 24* for descriptive statistics, EFA and reliability, and independent-samples t-tests. *AMOS Version 24* was used for CFA, invariance testing, and SEM. The general process and software utilisation applied here were adapted by the author from a two-day workshop on

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‘Structural Equation Modelling (SEM) with *AMOS*’ run by the University of Essex, Colchester, UK on the 2nd and 3rd of May, 2018.

5.2 Pilot Study Exploratory Results

Table 5-1 below shows which product information treatments/experimental groups were featured in the pilot study. The target sample size was 198 observations, as calculated in the previous chapter, which includes allowances for missing data or unengaged responses.

Table 5-1: Experimental groups and product information treatments (asterisks indicate groups featured in the pilot study).

	Cost product information	Environmental product information	Preference product information	Physical condition product information
Group 1*	(-1)	(-1)	(-1)	(-1)
Group 2*	(1)	(-1)	(-1)	(-1)
Group 3*	(-1)	(1)	(-1)	(-1)
Group 4*	(-1)	(-1)	(1)	-1
Group 5*	(-1)	(-1)	(-1)	(1)
Group 6*	(1)	(1)	(-1)	(-1)
Group 7	(1)	(-1)	(1)	(-1)
Group 8	(1)	(-1)	(-1)	1
Group 9	(-1)	(1)	(1)	(-1)
Group 10	(-1)	(1)	(-1)	(1)
Group 11	(-1)	(-1)	(1)	(1)
Group 12	(-1)	(1)	(1)	(1)
Group 13	(1)	(-1)	(1)	(1)
Group 14	(1)	(1)	(-1)	(1)
Group 15	(1)	(1)	(1)	(-1)
Group 16	(1)	(1)	(1)	(1)

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In the following sections, the data screening procedures are described first, afterwards, data distribution assumptions of the independent and dependent variables are scrutinised. Finally, Cronbach's alpha scores are computed, and an EFA is performed to assess the reliability and convergent and discriminant validity of the survey instrument. As data collection lasted for less than three working days, no late response tests were conducted.

5.2.1 Data Screening Pilot Study

After initially exporting the 198 responses from Qualtrics, dummy variables were created to code each response according to which product information treatment was received in the study in *Excel*, which allowed deduction which experimental group the respondent belonged to. The administration of a product information treatment was marked as (1) and the absence of that treatment as (-1) for each of the four treatments.

Subsequently, standard data cleaning procedures were employed. In terms of missing values, none were identified by columns, meaning that no item caused a significant amount of missing data. Going by the rows, one observation was found to have a missing value on the ValCos_3 item. Responses to ValCos_1 and ValCos_2 were given as 'Somewhat agree' (4), and ValCos_4 as 'Agree' (5). The median 'Somewhat agree' (4) was imputed for ValCos_3 for this observation.

As for unengaged responses, standard deviations across the perceived value, perceived risk and purchase intention items were checked, as these are the independent and dependent variables; since the trust items act as primers, engagement was not checked for these.

One observation featured a standard deviation of 0 across the independent and dependent variables, as the respondent had answered every item with 'Strongly agree' (7). A second observation, with a standard deviation of 0.519, was further scrutinised as being close to the rule of thumb of 0.5, when respondents are likely to be unengaged. Upon closer inspection, the response was indeed unengaged, as evident by the response pattern. Both responses were therefore removed from the dataset. Seven other responses with a standard deviation between 0.657 and 0.731 were also analysed, but

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here, a lack of engagement could not be confirmed, and the responses were taken forward.

As such, the final pilot study dataset contained 196 valid responses split into the six different treatment groups, as illustrated in Table 5-2 below. Note that the values for the experimental groups differ due to the removal of unengaged responses. Ultimately missing values and unengaged responses were less frequent than expected. Similarly, the standard deviation of the independent and dependent variables across the different experimental groups was relatively similar. This means that the presence or lack of product information treatments did not significantly influence engagement or the respondents' ability to evaluate the hypothetical PSS, as would be indicated by significantly lower or higher standard deviations (see Table 5-2). An average standard deviation across the perceived value, perceived risk, and purchase intention items is noted as 1.619.

Table 5-2: Number of valid responses per treatment group in the pilot study with the average standard deviation across independent and dependent variables.

Treatment group	Responses	Average std. dev.
1	32	1.597
2	32	1.730
3	33	1.577
4	33	1.581
5	33	1.572
6	33	1.660

5.2.2 Pilot Study Reliability and Exploratory Factor Analysis

Initially, reliability was assessed using Cronbach's alpha scores. Table 5-3 shows that Cronbach's alpha scores were satisfactory for all constructs.

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Table 5-3: Reliability of each construct in the pilot study.

Construct	Number of variables	Cronbach's alpha
ValCost	4	0.937
ValVar	4	0.913
ValEnv	4	0.942
RisCon	4	0.946
RisPre	4	0.915
RisSO	4	0.916
RisRS	4	0.925
RisRL	4	0.943
PI	3	0.955

Variables relating to each construct were also scrutinised for sub-optimal items that would improve Cronbach's alpha scores if deleted; however, the only possible improvements were to remove ValVar_3 to improve the Cronbach's alpha score of the ValVar construct to 0.917; similarly, removing RisSO_1 would improve the Cronbach's alpha of the RisSO construct to 0.922. It was decided not to remove these items, as the change in Cronbach's alpha would be marginal beyond the 0.9 level at 0.04 and 0.06, respectively. Furthermore, retaining those items may be desirable, as researchers recommend at least three items, and ideally four items, per construct for CB-SEM – should items unexpectedly load poorly on their intended construct in the measurement model validation, necessitating the removal of items, this would leave little room for manoeuvre.

Following this, an EFA was performed. A principal axis factoring (PAF) method was employed, using a Promax rotation to extract nine factors according to the underpinning theoretical framework developed from the literature.

In terms of adequacy, that is, whether an EFA is suitable to perform on this data, initially the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy indicates whether the variance in the variables may be caused by latent factors at all. The value of 0.874 fell well within the recommended range of above 0.70. Bartlett's test of sphericity assesses whether the variables are unrelated and thus do not contain factors.

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This hypothesis could be rejected at the 0.000 significance level, indicating that there are latent factors in the dataset that may be explored further through an EFA (for both tests, see Appendix C, Table C-2).

The communality table reveals the extent to which items correlate with all other items in the dataset; communalities below 0.3 or 0.4 indicate that items may not later load onto any salient factor in the EFA (see Appendix C, Table C-3). Values in both the initial and extraction columns were acceptable, although this is only indicative of adequate factor loadings, and not proof of them.

According to the total variance explained, the nine latent factors accounted for a cumulative 79.669% variance in the variables, as shown in Table 5-4 (see Appendix C, Table C-4). The ninth factor only displayed an eigenvalue of 0.888, which is below the Kaiser criterion stating that each factor should have an eigenvalue of 1 or greater. This cut-off point has been described as arbitrary however (Courtney & Gordon, 2013), and analysis of a scree-plot describing the eigenvalues of all 35 latent factors does support the inclusion of this ninth factor. Finally, in this case, the nine latent factors have been developed on a review of the literature and will, therefore, be retained, as they describe nine nomologically separate constructs.

The pattern matrix table reveals the loadings of the individual variables onto the salient factors. In the following table, negligible loadings (<0.2) have been suppressed for easier readability, and factors have been sorted by size (see Table 5-4) to assess convergent validity and discriminant validity. The table reveals good results with variables consistently loading onto their intended constructs, meaning that convergent validity for all variables could be confirmed. Concerning discriminant validity, the weakest variable seems to be RisSO_1 at 0.660 and a cross-loading of 0.215 onto the perceived return sacrifice risk factor. Both loadings fall within normal tolerances, however, as the rule of thumb is that in the case of cross-loadings the primary loading should be at least 0.2 higher than the secondary loading as internal consistency should be significantly greater than external consistency. As such, discriminant validity is confirmed.

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Table 5-4: Pattern matrix factor loadings for the pilot study.

	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	.660	
PI_2									.930
PI_3									.888
PI_1									.853

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Given that an oblique rotation was selected, the structure matrix was analysed next. Here it was shown that loadings match the structure of the pattern matrix; loadings onto the respective constructs were higher for all items than loadings on other constructs (see Appendix C, Table C-6).

Finally, the factor correlation matrix was analysed. A correlation between two factors higher than 0.7 would indicate that these factors are not actually two separate constructs, but a single potentially higher-order construct, as a correlation of higher than 0.7 would prove that a majority of shared variance is explained by a single construct ($0.7 * 0.7 = 49\%$ shared variance across the two constructs). In this case, no such loadings are present; the perceived cost value and purchase intention factors were below that threshold at 0.655 (see Table 5-5, in which the perceived cost value construct is equivalent to factor 6 horizontally and purchase intention to factor 9 vertically). This provides further evidence of sufficient discriminant validity, as well as the decision to retain nine factors, despite a low Kaiser criterion for the ninth factor. Treating a factor that is hypothesised to be an independent variable construct (perceived cost value) predicting the dependent variable construct (purchase intention) as the same factor makes theoretically little sense, as the two are hypothesised to be strongly related yet they describe two different concepts in terms of PSS adoption.

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Table 5-5: Factor correlation matrix for the pilot study.

Factor	1	2	3	4	5	6	7	8	9
1	1.000								
2	-.158	1.000							
3	-.142	.367	1.000						
4	.309	-.141	-.165	1.000					
5	-.126	.414	.503	-.145	1.000				
6	.439	-.278	-.181	.537	-.353	1.000			
7	-.109	.462	.339	-.069	.301	-.182	1.000		
8	-.192	.261	.267	-.261	.161	-.104	.483	1.000	
9	.375	-.340	-.247	.364	-.408	.655	-.199	-.175	1.000

As discussed in the section on CMV and CMB, Harman's single-factor test was performed to test for CMB. The single factor accounted for 28.23% of the variance among the variables, which indicates no CMB bias despite the relatively high reliabilities according to Fuller et al.'s (2015) guidelines (see Appendix C, Table C-8).

5.3 Follow-up Study Exploratory Results

The pilot study data confirm that the survey instrument is fit for purpose, as the data display sufficient normality, reliability, and convergent and discriminant validity. Given these results, the instrument was not altered past the pilot study. Furthermore, since the pilot study was conducted under realistic conditions, it was decided to gather data on the remaining ten experimental groups using the same instrument and under the same conditions, rather than gathering the full 528 responses and discarding the 196 valid responses gathered through the pilot study. This decision was made to conserve resources and, under the research ethics imperative, not to gather more data than was required from human participants.

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Possible influences that could lead to the two datasets being markedly different were considered. As such, both studies were launched on Sunday nights so as to be available on Monday mornings; the spacing between the two studies was relatively short (the pilot study was launched 29.04.2018, the follow-up study 03.06.2018); and both studies were launched in late Spring/early Summer, minimising the impact of seasonality on a study on fashion products.

As such, an additional 330 responses were collected from the remaining ten experimental groups, as per the section on required sample size, and analysed similarly to the results of the pilot study to establish whether they displayed similar characteristics and could be merged. Similar to the pilot study, data collection was concluded within three working days, and no late-response tests were conducted.

5.3.1 Data Screening Follow-up Study

Similar data screening procedures were applied as had previously been for the pilot study; no missing values were identified by columns, meaning that no item caused a significant amount of missing data. Going by rows, one respondent had missing data across the perceived preference risk and perceived shopping opportunities risk items; this response was subsequently deleted.

As for unengaged responses, standard deviations were checked across the independent and dependent variables. One response featured a standard deviation of 0.236, as the respondent had answered most items with ‘Strongly disagree’ (1) and some with ‘Disagree’ (2); this response was also deleted. Six other responses with standard deviations between 0.656 and 0.747 were also scrutinised, but here no lack of engagement could be confirmed, and these were not removed from the dataset.

The dataset thus contained 328 valid responses split relatively evenly into the different treatment groups (see Table 5-6). The standard deviation across the perceived value, perceived risk, and purchase intention items was 1.614, compared to 1.619 in the pilot study, and provides evidence that additional product knowledge does not bear

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significantly on a respondent's ability or engagement in evaluating the fashion subscription.

Table 5-6: Number of valid responses per treatment group in the follow-up study with the average standard deviation across independent and dependent variables.

Treatment group	Responses	Average std. dev.
7	33	1.610
8	32	1.706
9	33	1.626
10	33	1.605
11	33	1.720
12	33	1.629
13	33	1.655
14	33	1.641
15	33	1.482
16	32	1.466

5.3.2 Follow-up Study Reliability Exploratory Factor Analysis

The results of the reliability analysis and EFA for the follow-up study are highly similar to those of the pilot study and are therefore summarised here; for further reference, full information is given in Appendix D.

Cronbach's alpha scores were high and above 0.9 (see Appendix D, Table D-1). Weak items that would improve Cronbach's alpha scores if deleted were checked. In the pilot study data set, the removal of ValVar_3 would have improved the perceived variety value construct by 0.04 and the removal of RisSO_1 the perceived shopping opportunities risk construct by 0.06. In the follow-up study data, it was found that removing RisCon_3 would improve the Cronbach's alpha of the perceived physical condition risk construct by 0.02 to 0.953; removing RisRS_1 would improve the perceived return sacrifice risk construct by 0.09 to 0.948, and removing PI_1 would improve the purchase intention construct by 0.09 to 0.976. Considering that these are

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again negligible improvements to already sufficiently high Cronbach's alpha scores, the items were not removed.

Following this, an EFA was performed on the data, following the same process with the pilot study as previously and using the principal axis factoring method with a Promax rotation to extract nine factors.

The KMO measure of sampling adequacy now displayed 0.910, which is higher than the previous 0.874; this is to be expected, due to the larger sample size. Bartlett's test of sphericity continued to reject the null hypothesis that the variables are unrelated at the 0.000 significance level (see Appendix D, Table D-2).

No communalities fell below 0.3 or 0.4 (see Appendix D, Table D-3). The nine factors explained a cumulative 81.518% of the total variance in the variables (see Appendix D, Table D-4) in comparison to 79.669% in the pilot study.

The pattern matrix displays a similar structure to the one of the pilot study, displaying satisfactory levels of convergent and discriminant validity (see Appendix D, Table D-5); the RisSO_1 item does not display a cross-loading higher than 0.2 as opposed to the pilot study.

The structural matrix shows that loadings match with those in the pattern matrix (see Appendix D, Table D-6). The factor correlation matrix also displays similar characteristics to those of the pilot study; the only high correlation remains the perceived cost value construct and the purchase intention construct with a loading of 0.660 (0.655 in the pilot study), which remains below 0.7 however, further strengthening the argument for satisfactory discriminant validity (see Appendix D, Table D-7).

Harman's single-factor test showed that a single factor explained 33.915% of the variance among the variables (in comparison to 28.23% in the pilot study), which indicates no CMB (see Appendix D, Table D-8).

5.3.3 Comparison of Pilot Study and Follow-up Study Data

This section confirms that the second batch of gathered data also conforms to data distribution requirements and that reliability, and convergent and discriminant reliability are also given, as is the expected latent-factor structure. Furthermore, throughout this section, the data from the follow-up study has been compared to that of the pilot study across the same indicators to assess the extent to which the two datasets are similar enough to be merged and analysed together. While the similarity in terms of data distribution (see Appendix E, Table E-1, Table E-2 and Table E-3), reliability, and the results of the EFA is evident, it may, however, be argued that the datasets represent different populations. To assess this, the demographic variables, the named online fashion retailers, and levels of trust in those retailers have been compared.

As expected, the follow-up study's demographics do not differ significantly from those of the pilot study. Age featured a mean of 2.78 and a standard deviation of 1.26 in the pilot study, in comparison to 2.91 and 1.12, respectively, in the follow-up study (see Appendix E, E-4). As for education, the pilot study displayed a mean of 3.48 and a standard deviation of 0.897 in comparison to the follow-up study's mean of 3.57 and 0.993 (see Appendix E, Table E-5). Looking at income, the pilot study showed a mean of 6.74 and a standard deviation of 4.53 as opposed to 7.58 and 4.352 in the follow-up study (see Appendix E, Table E-6). To allow for visual comparison, bar charts are appended (see Appendix E, Figure E-1, Figure E-2 and Figure E-3).

Similarly, the named online fashion retailers are largely the same, with ASOS and New Look leading the field, followed by Next and Boohoo.com accounting for a cumulative 54.1% in the pilot study and 54.3% in the follow-up study respectively, with the rest spread among a larger number of other companies, 44 for the former and 53 for the latter (see Appendix E, Table E-7). Trust in these companies is high, at a mean of 6.04 and standard deviation of 0.905 in the pilot study, and a mean of 6.02 and standard deviation of 0.883 in the follow-up study (see Appendix E, Figure E-4).

Based on this evidence, it has been concluded that the two datasets are sufficiently similar in their relevant characteristics to be merged and analysed together going forward.

5.4 Combined Exploratory Results

Having achieved a dataset of 524 observations after data screening, it is now possible to scrutinise the results. In this section the sample demographics will be described, the data distribution across the perceived value, perceived risk, and purchase intention items explored, not from a data distribution angle, but to assess how respondents evaluate the fashion subscription overall. Finally, in the spirit of transparency, an EFA on the combined dataset has been conducted, which will not be discussed but is referred to in Appendix F for the reader's benefit.

5.4.1 *Sample Demographics*

Standard descriptive statistics were calculated for the demographic data, which in this case were age, education, and personal income. Age data was collected in five-year increments from 18 years to 42 years with a no-response option. Table 5-7 gives an overview of the distribution of the respondents across these increments. The age profile overall is balanced with most respondents being between 23 and 37 years old. There are fewer than 38 to 42-year-old respondents, which is due to the implementation of the age screening of including only respondents up to 39 years through Prolific's set of screening questions. No-responses for all demographic variables were imputed proportionately across the other response options. Also, it is noteworthy that each demographic item has been imputed into a smaller number of values for the later structural model analysis: age has therefore been divided into a low (18 – 27 years), medium (28 – 32 years), and high (33 – 42 years) category using a set of three dummy variables.

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Table 5-7: Age of respondents of the combined results.

	Frequency	Per cent	Cumulative per cent
18 – 22 years	70	13.4	13.4
23 – 27 years	146	27.9	41.2
28 – 32 years	139	26.5	67.7
33 – 37 years	125	23.9	91.6
38 – 42 years	43	8.2	99.8
Rather not say	1	.2	100.0
Total	524	100.0	

Similarly, data on the respondents' educational achievements were gathered, as detailed in the methodology chapter, ranging from no formal education to doctorate degrees. Table 5-8 shows that the majority of respondents have either college/A-levels education or undergraduate degrees. Similar to age, educational achievements have been divided into low (no formal qualification – College/A levels) and high (Undergraduate degree – Doctorate degree) categories.

Table 5-8: Educational achievements of respondents of the combined results.

	Frequency	Per cent	Cumulative per cent
No formal qualifications	4	.8	.8
Secondary school/GCSE	65	12.4	13.2
College/A levels	188	35.9	49.0
Undergraduate degree (BA/BSc/other)	186	35.5	84.5
Postgraduate degree (MA/MSc/MPhil/other)	74	14.1	98.7
Doctorate degree (PhD/MD/other)	6	1.1	99.8
Rather not say	1	.2	100.0
Total	524	100.0	

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Finally, household income data before tax were gathered in £5,000 increments from £10,000, with increasing increments beyond £60,000 annually, and a final no-response option. The data show that most respondents were within the first third of the range, as indicated in Table 5-9. No-responses were significant for this variable, which is not uncommon for income data. Income has been divided into low (less than £10,000 - £29,999) and high (£29,999 - £149,999) categories, based on the median UK annual household income in 2017 at £27,310 (Office for National Statistics, 2018).

Table 5-9: Income of respondents of the combined results.

	Frequency	Per cent	Cumulative per cent
Less than £10,000	25	4.8	4.8
£10,000 - £14,999	26	5.0	9.7
£15,000 - £19,999	54	10.3	20.0
£20,000 - £24,999	50	9.5	29.6
£25,000 - £29,999	61	11.6	41.2
£30,000 - £34,999	61	11.6	52.9
£35,000 - £39,999	54	10.3	63.2
£40,000 - £44,999	27	5.2	68.3
£45,000 - £49,999	37	7.1	75.4
£50,000 - £54,999	25	4.8	80.2
£55,000 - £59,999	12	2.3	82.4
£60,000 - £69,999	20	3.8	86.3
£70,000 - £79,999	15	2.9	89.1
£80,000 - £89,999	8	1.5	90.6
£90,000 - £99,999	7	1.3	92.0
£100,000 - £149,999	7	1.3	93.3
More than £150,000	6	1.1	94.5
Rather not say	29	5.5	100.0
Total	524	100.0	

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One other item that is not strictly a demographic variable, but can also be quantified are the named online fashion retailers from which respondents most frequently buy clothing. Here, ASOS accounts for 126 mentions of the total of 524, equivalent to 24%. 46% of respondents named a brand that was named fewer than ten times in the pilot or follow-up study; these brands are summarised under 'other' in Figure 5-1.

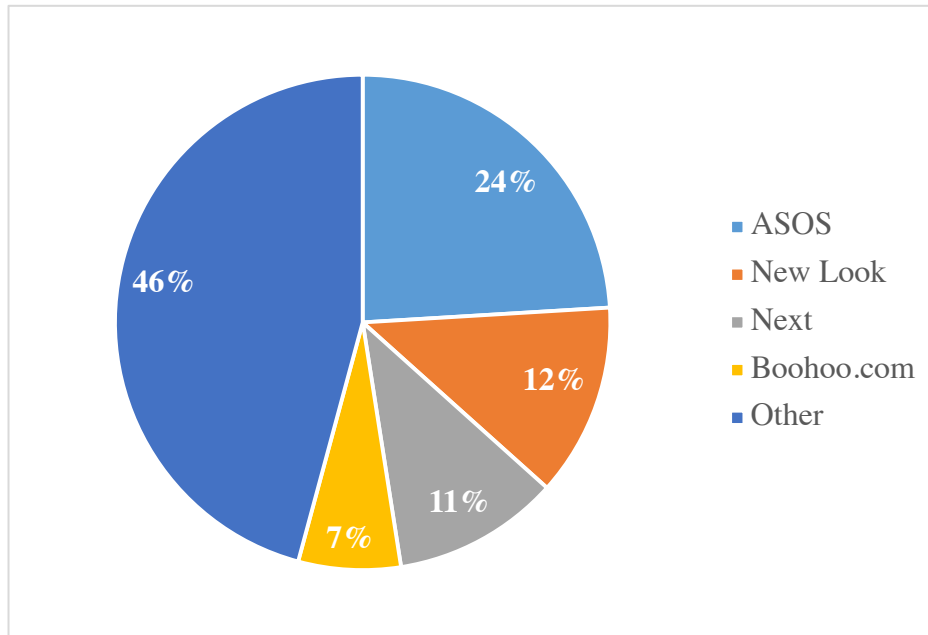


Figure 5-1: Online fashion retailers named by respondents.

5.4.2 Data Distribution

Given that normality assumptions have been analysed for the pilot and follow-up studies, the descriptive results will be focused on here. For perceived value items, the mean shows that many respondents tend to 'agree a little' (5) on the 7-point Likert scale (given the unimodal distribution). This indicates that respondents generally agree that there are some benefits to the hypothetical PSS offers, especially in the case of perceived variety value and perceived environmental value (see Table 5-10).

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Table 5-10: Descriptives for perceived value items of the combined results.

	Mean	Std. dev.	Skewness	Std. error	Kurtosis	Std. error
ValCos_1	4.41	1.789	-.392	.107	-.992	.213
ValCos_2	4.26	1.830	-.284		-1.077	
ValCos_3	4.17	1.935	-.157		-1.242	
ValCos_4	4.15	1.876	-.161		-1.143	
ValVar_1	5.41	1.571	-1.221		.929	
ValVar_2	5.64	1.425	-1.430		1.931	
ValVar_3	5.28	1.590	-.943		.202	
ValVar_4	5.69	1.358	-1.474		2.340	
ValEnv_1	5.10	1.390	-.737		.295	
ValEnv_2	4.99	1.428	-.680		.129	
ValEnv_3	5.08	1.403	-.726		.243	
ValEnv_4	4.97	1.403	-.575		-.095	
Valid N (524)						

Perceived risk items tend to be evaluated slightly higher than the middle point of the 7-point Likert scale at 'Neither agree nor disagree' (4), which indicates that most of the respondents perceive some degree of risk with the PSS for most of the perceived risk constructs, which is in line with expectations based on the literature (see Table 5-11).

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Table 5-11: Descriptives for perceived risk items of the combined results.

	Mean	Std. dev.	Skewness	Std. error	Kurtosis	Std. error
RisCon_1	4.77	1.659	-.518	.107	-.706	.213
RisCon_2	4.52	1.680	-.368		-.915	
RisCon_3	4.88	1.603	-.687		-.324	
RisCon_4	4.85	1.752	-.621		-.629	
RisPre_1	5.24	1.483	-.831		.224	
RisPre_2	5.01	1.628	-.785		-.212	
RisPre_3	5.22	1.441	-.851		.169	
RisPre_4	5.21	1.529	-.915		.188	
RisSO_1	4.00	1.654	-.075		-1.004	
RisSO_2	4.35	1.857	-.319		-1.057	
RisSO_3	3.84	1.752	.048		-1.088	
RisSO_4	4.27	1.868	-.252		-1.123	
RisRS_1	4.61	1.721	-.426		-.787	
RisRS_2	4.24	1.702	-.163		-.950	
RisRS_3	4.01	1.680	.004		-.966	
RisRS_4	4.21	1.705	-.167		-.951	
RisRL_1	4.84	1.594	-.655		-.421	
RisRL_2	4.98	1.642	-.734		-.346	
RisRL_3	4.88	1.694	-.657		-.544	
RisRL_4	4.93	1.645	-.686		-.399	
Valid N (524)						

Looking at the purchase intention variables, it is apparent that the mean is slightly higher than the first negative in a (3) response on the 7-point Likert scales. This indicates that consumer interest in these PSS is neither extremely high nor low by default, and supports the argument that the hypothetical PSS is realistic enough to result in different intentions on the parts of different respondents (see Table 5-12).

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Table 5-12: Descriptives for purchase intention items of the combined results.

	Mean	Std. dev.	Skewness	Std. error	Kurtosis	Std. error
PI_1	3.46	1.761	.098	.107	-1.088	.213
PI_2	3.18	1.848	.373		-1.105	
PI_3	3.19	1.800	.352		-1.007	
Valid N (524)						

The trust item that was used to distribute respondents evenly across the experimental groups was heavily negatively skewed, as were the other trust items from Gefen's (2002) scale (see Appendix F, Table F-1). This is unsurprising, and confirms Gefen's (2002) findings that trust and repeated interaction with a brand go hand in hand. Going forward, it may be assumed that the provider of the PSS is highly trusted by the vast majority of respondents, although it will also be tested later whether there are any statistically significant differences during the structural model analysis. Similar to the demographic items, the trust item has been divided proportionately into a low (response 5 or below), medium (6) or high (7) category (see Figure 5-2).

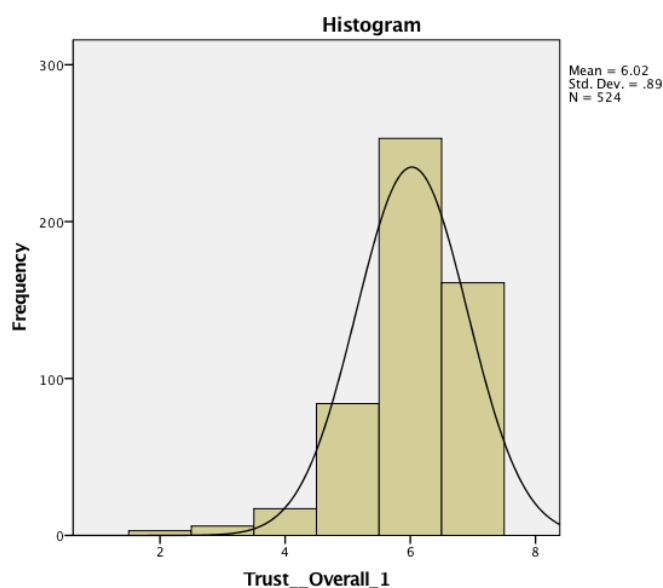


Figure 5-2: Trust in the named brand by respondents of the combined results.

5.4.3 Exploratory Factor Analysis

Results of the EFA of the combined dataset showed nothing unexpected, given that these analyses had been performed on the two datasets separately before with satisfactory performance, but the results are given in Appendix F. The exception here are Cronbach's alpha scores, which are discussed in later sections of this chapter.

5.5 Model Analysis

Having displayed the descriptive results of the study and established that the combined dataset meets the requirements of SEM, it is now possible to proceed to the measurement model analysis.

Initially, a CFA was conducted to confirm the extent to which the data fit the underpinning theoretical assumptions that were explored in the EFA, with reliability, and convergent and discriminant validity established afterwards. Two further steps were taken by testing for invariance across different groups and testing for multicollinearity. Afterwards, it was possible to proceed to the structural model analysis that is concerned not with measurement, but with how the factors relate to each other, as per Anderson and Gerbing's (1988) two-step approach to CB-SEM.

5.5.1 CFA Model Fit Results

An initial model was constructed by connecting each observed variable to its previously identified construct, as per the EFA results, resulting in the association of 35 observed variables with nine factors. Given that no data were missing from the dataset, it was not necessary to estimate intercepts and means. The model displayed good fit, as indicated by Table 5-13 below.

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Table 5-13: Initial fit indices of the measurement model.

	Fit indices	Observed indices	Threshold
Absolute fit indices	Chi-square	1,052.356, $p = 0.000$	$p > 0.05$
	DF	524	$p \geq 0$
	Chi-square/DF	2.008	< 3
	RMSEA	0.044	≤ 0.06
	SRMR	0.036	≤ 0.08
Incremental fit indices	CFI	0.972	≥ 0.95
	TLI	0.968	≥ 0.95
Parsimonious fit indices	PGFI	0.747	≥ 0.50
	PNFI	0.833	≥ 0.50

As per the previous discussion on specification searches, factor loadings were examined first to identify poorly loading variables. No variables displayed poor loading by the 0.50 threshold recommended by Hair et al. (2010) (see Appendix G, Table G-1).

Looking at SRs and MIs with a threshold of 40 and above, a single residual variance was displayed, which was a correlation between the error terms of the first two cost value items, displaying an MI value of 53.233 and EPC of 0.293. These items were adapted from Sweeney and Soutar's (2001) perceived value scales. Given that the wording of those variables is not similar, a case for covarying these errors could be made on methodological grounds (Landis et al., 2009). The critiques of Hermida (2015) and others, however, should be considered, and as model fit without any deleted variables or covaried errors is already acceptable, the decision was taken not to delete either item or covary their errors.

5.5.2 Reliability and Validity Assessment

Reliability, as assessed by Cronbach's alpha scores, was high, with all constructs exhibiting higher Cronbach's alpha scores than 0.90 (see Table 5-14). Peterson and Kim (2013) however critique Cronbach's alpha for underestimating actual reliability and propose composite reliability (CR) as an additional measure for SEM - earlier Fornell and Larcker (1981) proposed a threshold of 0.80 here. All constructs match this threshold. Based on these scores it may be argued that constructs were measured narrowly and that there could be redundant items that do not contribute much to the measurement of the underlying construct, with a Cronbach' alpha of 0.95 given as the upper threshold (Tavakol & Dennick, 2011). This threshold is exceeded by the perceived environmental value construct, but other constructs also come close. Ultimately, this detracts from the efficiency of the measurement of the different constructs, but it cannot be argued that this decreases their validity.

Convergent validity is established through factor loadings greater than 0.50 or 0.70 in the EFA and CFA, previously (Hair et al., 2010); another measure of convergent validity is average variance extracted (AVE), which should be higher than the measurement error variance (MSV) (Fornell & Larcker, 1981), as this would suggest that items explain more errors than variances among them. Based on Table 5-14, convergent validity can be confirmed. Finally, all factor loadings are higher than 0.50 and are, therefore, acceptably high.

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Table 5-14: Reliability and convergent validity scores.

	Cronbach's alpha	CR	AVE	MSV	Factor loadings
ValVar	0.943	0.913	0.726	0.228	0.74 - 0.93
ValCos	0.909	0.939	0.795	0.486	0.85 – 0.94
PI	0.945	0.963	0.897	0.486	0.91 – 0.97
RisRL	0.950	0.948	0.819	0.268	0.86 – 0.93
RisRS	0.926	0.935	0.783	0.268	0.82 – 0.94
RisSO	0.927	0.928	0.764	0.265	0.80 – 0.91
RisPre	0.934	0.928	0.764	0.251	0.81 – 0.94
RisCon	0.947	0.951	0.828	0.251	0.85 – 0.94
ValEnv	0.963	0.945	0.812	0.230	0.88 – 0.92

Discriminant validity is established by examining the correlations between items of construct combinations and comparing them to the square root of the AVE shared by the items of those constructs (Fornell & Larcker, 1981; Segars, 1997), which tests whether more variance is explained by another construct's items than by the construct's own items (Hair et al., 2010). Table 5-15 below shows that the square roots of the AVE scores are consistently higher than the correlations below, satisfying discriminant validity.

Table 5-15: Square roots of AVE (diagonals) and correlations between constructs (off-diagonals).

ValVar	0.852								
ValCos	0.486	0.899							
PI	0.392	0.704	0.947						
RisRL	-0.166	-0.332	-0.484	0.905					
RisRS	-0.164	-0.216	-0.311	0.518	0.885				
RisSO	-0.251	-0.122	-0.271	0.330	0.515	0.874			
RisPre	-0.192	-0.387	-0.453	0.467	0.379	0.296	0.874		
RisCon	-0.203	-0.203	-0.348	0.427	0.371	0.320	0.501	0.910	
ValEnv	0.355	0.491	0.360	-0.149	-0.084	-0.154	-0.173	-0.132	0.901

5.5.3 Invariance Testing

Having established adequate model fit, reliability, convergent and discriminant validity as well as other assumptions for the full dataset comprising of all 16 experimental groups, invariance needs to be established. This includes configural, measurement, and structural invariance as outlined the methodology chapter.

Byrne (2012) cites Cheung and Rensvold (2002) who propose a change of <0.01 for CFI values, while Chen (2007) recommends a change of <0.015 for RMSEA to claim invariance. A significant chi-square test is described as an excessively stringent criterium that is not used in practice anymore. Table G-2 in Appendix G indicates that model fit does not markedly decline across the different product information conditions as CFI changes do not exceed 0.001. For the environmental product information treatment groups, the chi-square difference test is significant for the structural model, which might indicate that these groups differ in terms of their structural relationships. A closer inspection by constraining individual structural paths and conducting a series of chi-square difference tests, reveals that this is not the case however. As such, the two groups are indeed structurally invariant. Based on these results, invariance can be confirmed.

This confirms that none of the product information treatments altered the structural relationships between the constructs; providing respondents with environmental product information, for example, does not change the relationship between perceived environmental value and purchase intention.

5.5.4 Multicollinearity Assessment

Realistically, a complete lack of multicollinearity is unlikely, but variation inflation factor (VIF) values below three indicate a satisfactory lack of multicollinearity, and even values below five can be acceptable (Bowerman & O'Connell, 1990). This test was conducted using imputed composite factor scores from the measurement model

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and all other variables that are hypothesised to impact on purchase intention. VIF values ranged from 1.029 to 1.974 for the independent variables, with tolerance values of above 0.2, as per Field's (2013) recommendation; as such, multicollinearity was not an issue in this study.

5.5.5 Structural Model Analysis

Coming to the structural model analysis, first model fit indices are scrutinised similar to during the CFA, after which the relationships for the overall model are assessed. The structural model contained 14 exogenous (independent) constructs and one endogenous (dependent) construct. Table 5-16 shows the model fit indices for this model.

Table 5-16: Initial model GOF indices of the measurement model.

	Fit indices	Observed indices	Threshold
Absolute fit indices	Chi-square	1,252.556, $p = 0.000$	$p > 0.05$
	DF	665	$p \geq 0$
	Chi-square/DF	1.884	< 3
	RMSEA	0.041	≤ 0.06
	SRMR	0.052	≤ 0.08
Incremental fit indices	CFI	0.969	≥ 0.95
	TLI	0.965	≥ 0.95
Parsimonious fit indices	PGFI	0.760	≥ 0.50
	PNFI	0.840	≥ 0.50

It is evident that the model fit has declined from the measurement model because of the inclusion of demographic variables and the trust item. Crucially SRMR, RMSEA, CFI, TLI, and NFI, which have been described as the most valid measures of model fit, remain satisfactory.

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The proposed structural model estimates the existence and strength of the hypothesised relationships determining purchase intention, which originate from the three perceived value and perceived risk constructs, as well as the control variables in age, education achievements, household income, and trust in the provider.

The structural model test result provides information on estimated path coefficients (unstandardised and standardised), standard errors, t-values, and resulting probabilities. Here, the standard errors reflect the error in the estimated path coefficient, while the t-value (equivalent to the critical ratio) is calculated by dividing the path coefficient by the standard error. A t-ratio of above or below 1.96 then corresponds to a p-value at 0.05, and a t-ratio above or below 2.56 to a p-value of 0.01. The 0.05 and 0.01 p-values (denoted as ** and ***, respectively) are typically taken as proxies for determining whether a relationship exists. At a p-value of 0.05, the likelihood of committing a type-1 error (i.e., rejecting the null hypothesis of no relationship existing when it is erroneous to do so) is 5%, and vice-versa for a 0.01 p-value.

In this case there are two significant results at the 0.05 level, which are the effects of the perceived physical condition risk and perceived shopping opportunity risk constructs, and two significant results at the 0.01 level, which are the effects of the perceived cost value and perceived return liability risk constructs (see Table 5-17).

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Table 5-17: Estimated relationships in the structural model.

		Est.	Std. est.	S.E.	t-value	p
ValCos	PI	0.617	0.549	0.05	12.378	***
RisCon	PI	-0.091	-0.08	0.043	-2.116	0.034
RisSO	PI	-0.099	-0.092	0.041	-2.416	0.016
RisRL	PI	-0.238	-0.203	0.047	-5.065	***
Age	PI	-0.082	-0.054	0.045	-1.832	0.067
RisPre	PI	-0.097	-0.073	0.053	-1.831	0.067
ValVar	PI	0.064	0.047	0.051	1.256	0.209
ValEnv	PI	0.026	0.019	0.049	0.536	0.592
RisRS	PI	0.013	0.011	0.046	0.277	0.782
Trust	PI	0.037	0.019	0.059	0.632	0.528
Education	PI	0.018	0.014	0.039	0.468	0.640
PersonalInc	PI	-0.024	-0.049	0.015	-1.653	0.098

Based on these results, four out of eight hypotheses could be confirmed, as per Table 5-18. The r-squared value of purchase intention was 0.60, which implies that 60% of the variance in purchase intention is explained by the model. None of the control variables showed a significant impact on purchase intention.

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Table 5-18: Supported hypotheses based on the structural model analysis.

Number	Hypothesis	Supported
H1	Perceived cost value is positively related to purchase intention.	0.549***
H2	Perceived variety value is positively related to purchase intention.	/
H3	Perceived environmental value is positively related to purchase intention.	/
H4	Perceived physical condition risk is negatively related to purchase intention.	-0.08**
H5	Perceived preference risk is negatively related to purchase intention.	/
H6	Perceived shopping opportunities risk is negatively related to purchase intention.	-0.092**
H7	Perceived return sacrifice risk is negatively related to purchase intention.	/
H8	Perceived return liability risk is negatively related to purchase intention.	-0.203***

5.6 Direct Effects Analysis

In this section, the direct effects of the product information treatments on their hypothesised constructs are assessed via a series of independent samples t-tests. The process detailed in the methodology chapter will be followed, which first includes a visual analysis of Q-Q plots of each treatment condition and its respective construct, then scrutiny of the relevant descriptive statistics, and finally the independent-samples t-tests results starting with Levene's Test for Equality of Variances. Imputed factor scores from the CFA are used for these analyses.

5.6.1 Cost Product Information

The observations largely follow the diagonal line of the Q-Q plot which indicates normality, although observations at the very upper and lower end tend to deviate upwards and downwards respectively. This indicates that the data are over-dispersed because they provide more answers in the extreme than would be expected based on a

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normal distribution. This means that the majority of the respondents belonging to either treatment group evaluated the PSS close to the normal distribution, but that there were also respondents who evaluated the PSS more extremely in both groups. The data are therefore not distributed normally, but approximately normally enough to be used in a t-test, considering the t-test's robustness against violations against normality, particularly in large sample sizes.

Examining the group statistics for both groups, it is clear that the group lacking the cost product information treatment features a mean of 3.810 (std dev.: ± 1.542) in the perceived cost value score, while the group that has received the treatment gives a mean of 3.970 (std dev.: ± 1.556) (see Appendix H, Table H-1). Based on this similarity in terms of standard deviations, Levene's Test of Equality of Variances is significant, meaning that the assumption of homogeneity of variances can be accepted. The t-test result overall is, however, insignificant, which implies that the cost product information treatment cannot be assumed to be responsible for the small increase in mean between the two groups, thus falsifying Hypothesis 9 (see Appendix H, Table H-2).

5.6.2 Environmental Product Information

Coming to the environmental knowledge treatment, Q-Q plots show that under both treatment conditions, low responses are few, which becomes more extreme with the treatment condition present: the data are left-skewed. Similar to the cost treatment groups, responses at the upper end deviate upwards, indicating more extreme responses towards the upper end and the data being over-dispersed/leptokurtic. It must, therefore, be acknowledged that there are deviations from normality for skew and kurtosis; however, these deviations are largely similar for both groups, and following the argument previously it is thus assumed that a t-test can still yield valid findings.

Given the larger differences in standard deviations between the two groups (see Appendix H, Table H-3), Levene's Test of Equality of Variances was not significant, meaning that the assumption of homogeneity of variances cannot be accepted and the Welch t-test must be interpreted in place of the standard t-test results (see Appendix

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H, Table H-4). Welch's t-test result is significant, indicating that the difference in means between the two groups is indeed caused by the product information treatment. As such, the group that received the environmental product information had a higher perceived environmental value score (mean: 5.163, std. dev.: ± 1.104) than that of the group lacking the treatment (mean: 4.724, std. dev.: ± 1.38234), with a statistically significant difference of 0.438 (95% confidence interval: 0.653 to 0.223), $t(496.053) = 4.007$, $p \leq 0.001$, Cohen's $d = 0.360$. The effect size of the environmental product information is thus between what Cohen describes as a small effect size of 0.2 and a medium effect size of 0.5 (Field, 2013), verifying Hypothesis 10.

5.6.3 Physical Condition Product Information

For the physical condition product information treatment, the group without the treatment condition showed few low responses in the perceived physical condition risk score, leading to a departure from normality at the lower end and a slight skew to the left. This becomes more balanced for the group with the treatment condition present. For both groups, however, there are again more extreme responses at the upper end than would be expected in a perfectly normal distribution, leading to an over-dispersal of data and a slightly leptokurtic pattern. It is evident that the presence of the treatment condition improves normality, but, in both cases, the most defining characteristic in the excessive positive kurtosis remains similar, as in the previous t-tests. Hence, it can be assumed that sufficient normality is present to progress with a t-test.

As indicated by the relatively similar standard deviations (see Appendix H, Table H-5), Levene's Test of Equality of Variances was significant, meaning that the assumption of homogeneity of variances can be accepted (see Appendix H, Table H-6). The t-test result was also significant, verifying that the difference in means is caused by the product information treatment. The group, having received the physical condition product information, therefore, has a lower mean in the perceived physical condition risk score (mean: 4.470, std. dev.: ± 1.515) than that of the group lacking the treatment (mean: 4.863, std. dev.: ± 1.523). The statistically significant difference was 0.393 (95% confidence interval: 0.132 to 0.653), $t(522) = 2.958$, $p = 0.003$, Cohen's d

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= 0.259. The effect size of the physical condition knowledge treatment is therefore small but significant, confirming Hypothesis 11.

5.6.4 Preference Product Information

The preference treatment groups were both left-skewed with fewer responses at the lower end and an over-dispersal of responses at the upper end, indicating excessive positive kurtosis; this distribution is, however, more equal for both groups than for the physical condition treatment groups. Approximate normality can be assumed based on the Q-Q plots, although the significant left skew might hinder the establishment of statistically valid effect sizes.

Roughly similar standard deviations (see Appendix H, Table H-7) caused a significant result for Levene's Test of Equality of Variances; as such the assumption of homogeneity of variances was accepted (see Appendix H, Table H-8). The t-test result confirms that the difference in means was caused by the preference product information treatment at the $p \leq 0.05$ level. As such, the group with the additional preference product information featured a lower perceived preference risk score (mean: 4.741, std. dev.: ± 1.306) than the group without that product information (mean: 4.965, std. dev.: ± 1.298), with a statistically significant difference of 0.224 (95% confidence interval: 0.001 to 0.448), $t(522) = 1.973$, $p = 0.049$, Cohen's $d = 0.173$. While the effect size is very small, it is statistically significant, and therefore, Hypothesis 12 is formally accepted.

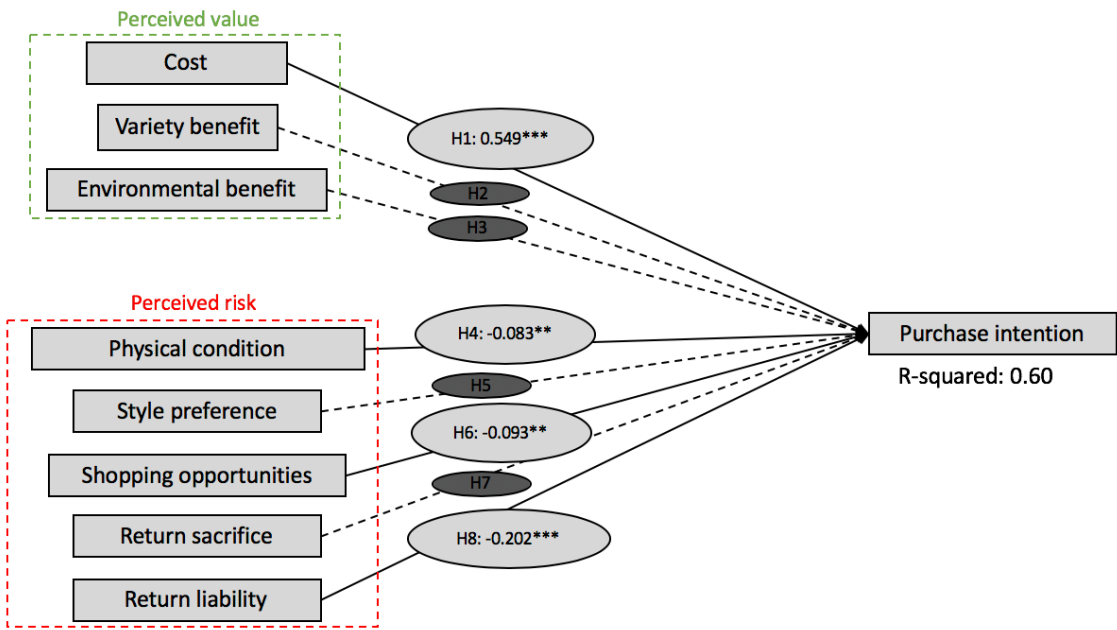
As such this section confirms that the environmental information, physical condition information, and preference product information treatments show the hypothesised effects on their respective constructs, which could not be confirmed for the cost product information treatment.

For due diligence, it has also been assessed whether the product information treatments influence purchase intention directly, which was not hypothesised but is possible. The same procedure as for the other t-tests was followed, and none of the information treatments shows a significant direct effect on purchase intention.

5.7 Chapter Output

This chapter has analysed the assembled data of this research project. The main finding of this chapter is the following Figure 5-3, which shows the extent to which the applied framework of this study has been confirmed or rejected. Please note that the left part of the framework refers to the series of t-tests and the experiments, while the right part refers to the results from the CB-SEM and the PSS evaluation. This visual mixture of analytical methodologies is for the reader's benefit.

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Hypotheses	Product information treatments	Cohen's D
H9	Cost information	/
H10	Environmental information	0.36
H11	Physical condition information	0.26
H12	Preference information	0.17

Figure 5-3: Empirical results and the applied framework split into results of the structural model (left) and t-tests (right).

6. Discussion

6.1 Chapter Introduction

Beyond this introductory section, the discussion chapter is split into three sections.

Initially, Section 6.2, ‘Predictors of PSS Purchase Intentions’, discusses the results from the structural model. This section is divided into a first sub-section on 6.2.1, ‘Perceived Values Driving PSS Consumer Adoption’, and a second sub-section on 6.2.2, ‘Perceived Risks Inhibiting PSS Consumer Adoption’. It is shown how the results of this research support some assumptions of the existing literature while refuting others.

Afterwards, Section 6.3, ‘Product Information Effects’ focuses on the hypotheses that have been made about the ability of more specific product information to assure consumers of perceived values and alleviate the severity of perceived risks. This section is divided into four sub-sections based on the four product information types featured in this study: 6.3.1, ‘Cost Product Information’, 6.3.2, ‘Environmental Product Information’, 6.3.3, ‘Preference Product Information’ and 6.3.4, ‘Physical Condition Product Information’.

Lastly, the main points of this chapter are summarised in Section 6.4, ‘Chapter Output’.

6.2 Predictors of PSS Purchase Intentions

This first section discusses the main empirical output of the study, which focuses on identifying relevant predictors of purchase intention. As such, this section bears on the first research question asked in the introductory chapter of this thesis, which was:

RQ1: What are the drivers for and inhibitors to consumer adoption of PSS?

6. Discussion

Before going into detail about the interpretation and discussion of perceived values and risks, it is worth reflecting on the control variables pertaining to trust in the provider and consumer demographics.

Trust in the provider was controlled to be high for reasons described in the model development and methodology chapters. While CB-SEM does not handle nonnormal data well, based on the available data, it must be concluded that at such high levels of trust, this factor assumed to be critical by other authors seemingly does not become a significant direct determinant of purchase intention. This in itself is not surprising, and it was with this rationale that trust in provider was controlled for. However, this also means that this finding should be considered within the limits of the study design – the reason why trust did not exert a significant effect on purchase intention is most likely that it was controlled for. As such, it should be assumed that trust does affect purchase intention as previous scholars have argued, but not at relatively uniformly high levels as were observed in this study.

Nevertheless, this finding points to a validity problem in contemporary studies on consumer adoption of PSS that was touched upon in the literature review. Studies attempting to gauge consumer adoption propensities for such products when offered by nameless, fictional providers allow identification of the range of factors that may be relevant when the provider is not trustworthy at all. However, the resulting findings will be of little practical value if such PSS are to become a widespread reality outside of niche markets, when offered by small and largely unknown brands, such as Vigga. While these studies, including those by Armstrong et al. (2015) and Rexfelt and Hiort af Ornäs (2009), have rightly identified trust as a relevant factor, research has made little progress since then in this regard (e.g., Cherry & Pidgeon, 2018; Poppelaars et al., 2018). Based on this study's rationale, and knowing that a high level of trust in a provider does not directly dissuade the consumer from the adoption of radically different PSS, it is instead proposed that research on consumer adoption of PSS more consciously engages with different types and levels of trust to contribute to developing practical knowledge.

Furthermore, neither of the demographic items showed a significant direct effect on purchase intention. While the age, gender and location of the study participants was controlled for within limits, this shows that within these parameters, there are no

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significant differences. Education and income, in particular, are of interest here, as they were not controlled for during sampling. Contrary to Piscicelli et al.'s (2015) finding that female consumers engaging in C2C sharing are more educated than the British population average, it was shown in this case that education in itself is not related to the adoption propensities of radically different PSS per se. This also refutes Hirschl et al.'s (2003) notion of the 'open-minded' consumer, who they claim would be more open to the adoption of PSS as they tend to be more educated.

Similarly, the results of this study indicate that income is not a significant predictor. While past studies have argued that more educated and wealthy consumers may be more inclined to adopt PSS (e.g., Mont et al., 2006; Catulli & Reed, 2017), this cannot be confirmed here; however, admittedly, this assertion may still hold in higher stakes contexts, such as the decision to sell a car to become reliant on car-sharing.

Overall, the notion of a consumer type who is able to adopt a use-cycle approach to costing through education and openness to innovative but risky products because they have a financial cushion cannot be confirmed here. As identifying this type or focusing on consumer demographics was not the thesis' main objective, the granularity to go beyond this statement is not available. As a compromise, it may be assumed that demographics are only relevant for different PSS configurations, and, in those cases, likely through lower-order constructs. For example, education becomes a significant predictor of purchase intentions as working through stronger social or environmental attitudes when PSS are explicitly marketed as such (e.g., Chamberlin & Boks, 2018). Similarly, wealth could become significant when a PSS includes longer term financial commitments (e.g., Shih & Chou, 2011). For this study, however, it appears that, by default, a radical PSS featuring a lack of newness, ownership, or choice is not favoured by a specific demographic beyond the sample controls that have been put in place.

6.2.1 Perceived Values Driving PSS Consumer Adoption

Three factors were hypothesised as making consumers interested in adopting the fashion subscription over the conventional alternatives of buying new clothes. These were cost, variety, and environmental benefits, as presumably the most relevant

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advantages as asserted in previous, largely qualitative studies among consumers. Out of these three, only the potential to reduce expenditure when opting for the fashion subscription shows a significant effect, confirming H1, while H2 and H3 are rejected.

The fact that only the expectation of lowering spending is seen to significantly and positively predict purchase intentions confirms the views of more cautious scholars, such as Tukker (2015), who claim that cost will ultimately be the main consideration of consumers. More optimistic voices, such as Kang and Wimmer (2008), who see a shift towards a greater consideration of the environment, in particular, are refuted. As such, the importance of prices and monetary concerns established in orthodox marketing does hold true for PSS. At least, initially, it seems that the most important mechanism of driving diffusion of PSS in the marketplace will be extremely competitive pricing. The strength of the relationship is also of note here, and this study demonstrates the eminence of this aspect in predicting purchase intention beyond all other measured constructs.

This finding may be tied to some extent to the product category: fashion has become increasingly commodified, and the sample selected in this study may have a stronger attitude towards this commodification than the general population (Armstrong et al., 2015). However, in the context of shortening use-cycles of products across consumer goods, this does not significantly impede the generalisability of this finding – an argument that is strengthened as qualitative PSS studies on other product categories also report savings potentials as a potential driver of adoption. This study, however, quantitatively confirms the existence and major impact of this driver. In light of this finding, and the rejection of H2 and H3, earlier qualitative studies seem to have underestimated the utilitarian aspect of PSS adoption by consumers (e.g. Santamaria et al., 2016). This may be likely because the academic disciplines and theoretical approaches of scholars have engendered a focus on configurational aspects of the PSS and behavioural responses to those configurations (e.g., REXFELT & HIORT AF ORNÄS, 2009) rather than adopting frameworks from the area of marketing and consumer decision-making.

This finding becomes more relevant as the other drivers assumed to increase purchase intentions cannot be confirmed as statistically significant predictors.

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It appears that consumers readily recognise the environmental benefits of a PSS featuring the mechanisms contributing to greater sustainability, as indicated by the slightly negatively skewed items used to measure the corresponding construct. This corroborates studies by Armstrong et al. (2015, 2016). This recognition does not necessarily translate into corresponding intentions, however, which is a notion that has been observed previously (Catulli & Reed, 2017). This may be explained by looking at the attitude-behaviour gap: consumers tend to hold and voice certain, often socially desirable, attitudes, which appear to have little bearing on decision-making when more utilitarian factors are also considered (e.g. Young et al., 2010).

This points to a disconnect in PSS research. As has been shown in the literature review, the PSS concept has emerged out of an environmentally minded engineering research community in Europe, which is also reflected in the *Journal of Cleaner Production*, being the main outlet of corresponding research. There is a notion that this focus on environmental issues has caused a bias in existing research by focusing on environmental considerations that do not reflect the reality of PSS adoption from a consumer perspective, and statements such as ‘consumers have shown greater interest in environmental issues, making the PSS a business opportunity’ (Beuren et al., 2013, p226) might lead research and practice in a direction that will impede PSS diffusion in the long run. At this point, it would be beneficial to depart from the assumption that the potential environmental superiority will play a major role in PSS adoption in mass markets for the average consumer. Rather, it is proposed that the focus should be placed on how PSS may be designed and framed differently to tap into different consumer desires and needs. The next sub-section on product information will expand on this point.

Finally, the finding that access to an increased variety of clothing does not significantly improve purchase intentions shows a problem in mass-market result-oriented PSS. Going beyond the scale of individual consultancy and bespoke results, in mass-market cases a provider chooses an individual product from a larger pool of products of the same category (e.g. Bressanelli et al., 2018). Based on the results of this study, most consumers realise that the provider does have access to a greater pool of products than they do themselves and could provide them with a greater variety of clothing than they themselves would be able to, as the items tend to be negatively skewed. However, this

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access to a greater variety through a PSS may not be influential, as the consumer could also choose to consume a greater variety of clothing themselves if desired. This points towards a problem that may inhibit PSS in product categories that are highly competitive and where consumers possess the skills and experience to make informed choices. In such cases, the provider's skills and experience in choosing and providing product artefacts may count for little, as the consumer is objectively and/or subjectively able to choose and maintain product artefacts just as well.

This may not be the case for cars (e.g., Cherry & Pidgeon, 2018; Poppelaars et al., 2018) or washing machines (e.g., Bocken et al., 2018; Bressanelli et al., 2018), indicating that there are product categories that lend themselves more to a mass-market result-oriented PSS type, such as the fashion subscription analysed here. Unless individual consultancy and bespoke results can be efficiently provided to numerous consumers, this will remain an issue for PSS in consumer goods that seek to leverage greater service components. Scholars such as Baines et al. (2009) may argue that this is where greater differentiation and profitability lie for PSS providers, making this a crucial part of the future research agenda on PSS design.

6.2.2 Perceived Risks Inhibiting PSS Consumer Adoption

Five factors were hypothesised as reducing consumers' intentions to purchase the fashion subscription. These were the physical condition risk, preference risk, shopping opportunities risk, return sacrifice risk, and return liability risk. Out of these, the first, third, and last factors were found to negatively predict purchase intentions, confirming H4, H6, and H8, while rejecting H5 and H7.

The perception that pre-used clothing may be dirty or damaged is reported in virtually all studies on fashion and apparel PSS, and as such, this finding confirms previous research. Studies on other product categories have found analogous problems (e.g., Chian Tan et al., 2017): due to the physicality of the product artefacts, there is scope for them to deteriorate during use or transport. Such issues may be prevented at the product design stage through more robust design (e.g., Bocken et al., 2016) or through repair and remanufacture operations (Wang & Hazen, 2016), but to what extent and

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within what timescale existing consumer attitudes about quality issues tied to pre-used items can be addressed is unknown. As such, the lack of newness, as one of the primary mechanisms of achieving greater environmental sustainability, will remain a weakness of the PSS concept at least until consumer attitudes fundamentally change, and it may be that some consumer groups will not make this attitudinal change in the foreseeable future (Hirschl et al., 2003).

Moving on, the finding that the preference risk does not seem to reduce purchase intentions significantly is surprising but intriguing. Result-oriented PSS are scarcely discussed in literature in comparison to product- and use-oriented PSS, because they appear to diverge from common consumption paradigms to a greater degree and are unintuitive to consumers outside pure services. As such, the potentially superior environmental performance of result-oriented PSS is not reflected in practice or research activity until recently, and even then confined to very few product categories (e.g., Bocken et al., 2018; Bresanelli et al., 2018). In this literature, it is argued that consumers are wary of letting a provider make choices regarding how their needs are met, which includes a product artefact, as it is assumed that providers are not able or willing to do so in a satisfactory manner. However, it appears that the results of giving the choice of the product artefact that will be provided as part of the PSS does not appear to be a significant risk from the consumer's perspective. Given that this an integral aspect of result-oriented PSS and the primary mechanism assumed to improve its environmental performance, this is a significant finding.

Following this train of thought, result-oriented PSS that give the provider the scope to choose to provide a satisficing product artefact are not as futuristic as may be believed, because consumers do not view the relinquishing of choice as a significant barrier to adoption. Business models supplying fashion PSS, such as those reported by Park and Armstrong (2018), *Girl Meets Dress*, for example, may opt to retain control over which fashion products to supply and influence product design to be more durable. According to this study's findings, most consumers who are accepting of the use-oriented aspect of renting and leasing dresses will also be willing to adopt the corresponding result-oriented PSS aspects—in this scenario financial and environmental objectives would align seamlessly. As such, this finding opens up avenues for research on result-oriented PSS, as consumer attitudes are not as negative as previously suspected.

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Looking at the shopping opportunities risk, it appears that consumers are worried that PSS adoption could prevent them from participating in activities they might enjoy. In literature, the added convenience of PSS is sometimes conceptualised as an advantage rather than a disadvantage, particularly if activities related to acquisition, maintenance or disposal are labour-intensive or costly (Chamberlin & Boks, 2018).

In the context of fashion and considering the chosen sample, it was assumed that this would detract from the emotional, social, and hedonic activity of shopping, based on previous qualitative studies (Armstrong et al., 2015, 2016). While in many product categories, added convenience may indeed be seen as positive, for example in the case of cars (e.g. Cherry & Pidgeon, 2018), the findings of this study should be interpreted as a note of caution. Rexfelt and Hiort af Ornäs (2009) are right to hypothesise that consumers are both liberated from unenjoyable activities but may also be hindered in the realisation of enjoyable activities. As such, Mylan (2015) and Santamaria et al.'s (2016) standpoint that it is simply not clear as of yet which new enjoyable practices consumption of radically different PSS may enable warrants further attention. Replacing the more hedonic enjoyment of shopping in the case of fashion, or cleaning and caring for one's car will be difficult for PSS at this nascent stage. The extent to which providers can develop and communicate new practices to allow consumers to create more diverse and particularly non-utilitarian types of value, or whether diffusion of PSS will only occur once consumers themselves have adopted new and adapted existing practices, remains to be seen.

Coming to the fourth type of perceived risk identified, ownership remains a contentious issue. Previous studies have argued that consumers form emotional attachments to items as they are used in practices, contribute to identity, and are associated with pleasurable memories. The lack of ownership common to use-oriented PSS imply that such bonds are severed upon return of the item to the provider, causing a feeling of sacrifice, which has also been claimed in the case of fashion (Armstrong et al., 2015). However, it seems that the fast-fashion paradigm and the sheer speed and scale of clothing acquisition and disposal have weakened relationships between consumers and products. While the assertion that consumers may actually be positive about returning products to the PSS providers through a feeling of de-cluttering is not

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proven here (e.g., Catulli et al., 2017); however, it seems that the sense of loss when relinquishing usership of a product is at least not a hindrance.

Considering that other product categories are experiencing shortening use-cycles and commoditisation similar to fashion, this bodes well for the future of PSS. As such, there is an interesting notion here that the shortening of use-cycles and subsequent erosion of consumer-product relationships may actually contribute to PSS adoption in the long term, as usership rather than ownership becomes more acceptable.

However, the more impactful issue around ownership seems to be that of responsibility and dependency. The strongest perceived risk found in this study is related to financial liability for product damage or late return of the product, which validates Cherry and Pidgeon's (2018) claims that this point is the most severe challenge to the PSS concept. While providers should ensure that products are returned in good condition to meet financial targets, the environmental viability of the PSS concept also hinges on the ability to cycle items multiple times, as demonstrated by Vigga (Brun-Petersen & Riisberg, 2017). Consumers are acutely aware, however, that the relationship with a PSS provider is fundamentally different from that resulting from an arm's-length purchase, and entails additional responsibilities and liabilities. Given that the potential to save money is at the forefront of consumer minds, worries about being held financially liable for damage or late returns have the potential to diminish those savings, as providers may later 'claw back' those savings (Rexfelt & Hiort af Ornäs, 2009). It will be difficult for providers to address this point, as it has the potential to make provider interests diametrically opposed to consumer interests, souring the relationship on which the PSS depends. More research is needed here to determine sensible risk-sharing mechanisms, and this will be expanded on in the next section.

6.3 Product Information Effects and Trust

The second section discusses the insights gained from the product information treatments in conjunction with the high trust level. This relates to the second research question:

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RQ2: How can PSS providers leverage a high degree of trust to increase consumer adoption of PSS?

Given consumers' lack of familiarity of consumers with radical PSS, such as the fashion subscription analysed here, it was hypothesised that more specific product information could assure consumers of perceived values and mitigate perceived risks. The effects of four different types of product information were assessed, which were hypothesised to increase perceived cost and environmental value, as well as lower perceived physical condition and preference risk to be conducive to purchase intention according to H9, H10, H11 and H12. While H9 was rejected, the other hypotheses could be confirmed.

The environmental product information had the strongest effect. Given the simplicity of the product information, this indicates that consumers can be influenced in their evaluation without the introduction of more complexity that requires more time and cognitive effort from the consumer (e.g. Vogtländer et al., 2002). Given that perceived environmental value is not a significant predictor of purchase intention, it may be argued that such information is unnecessary in the first place, and that providers should focus on other product attributes when communicating information to potential adopters.

The second strongest effect had product information on the physical condition of pre-used items, which, through the perceived risk construct, can improve purchase intentions. This finding mirrors assertions in studies on refurbished or remanufactured items (Michaud & Llerena, 2011; Wang & Hazen et al., 2016) and shows that deliberate uncertainty reduction through product information is beneficial. However, even as the PSS provider was highly trusted by consumers, the effect of the product information remained moderate. It may, therefore, be argued that independent certification may serve as a better device for lowering perceived risks relating to the physical condition of 'not new' products (e.g., Catulli & Reed, 2017).

Preference product information showed a significant but weak effect on a perceived risk construct that was not a significant predictor of purchase intention. Nevertheless, the finding that a provider may reduce uncertainty here through simple assurances

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extends knowledge based on the scarcity of studies on PSS with result-oriented aspects (e.g. Armstrong et al., 2015; Brun-Petersen & Riisberg, 2017).

Finally, cost product information was not shown to influence evaluations of perceived cost value of the PSS significantly. This means that the most important driver for PSS adoption, i.e., cost-saving potentials, cannot be reliably communicated through product information by the provider in a manner that changes consumer evaluation. Consumers simply do not believe that the PSS will actually reduce their cost savings significantly beyond what they assume based on a barebone description of the PSS functioning. As such, the assurance of the product information is not believed and, therefore, does not influence subsequent evaluations. There are two explanations for why that may be the case.

First, it may be argued that consumers are implicitly aware of rebound effects emerging from adopting the PSS. In such cases, the consumer may assume that even if the PSS is cheaper than the conventional mode of purchasing clothes, the achieved savings are reinvested into the PSS or its conventional alternative. This would then result in a similar expenditure for the product category but at a higher consumption level, resulting in 'hyperconsumption' (Retamal, 2017). This may be a worst-case scenario from an environmental perspective, as environmental gains are offset by increased consumption, a worry that has been voiced (Cherry & Pidgeon, 2018; Mont et al., 2006). This indicates that, if one is serious about the environmental ambition of the PSS concept, its strongest driver for diffusion in cost savings should not be utilised in practice.

A different angle that is no less bleak would be to argue that consumers automatically assume that an offer featuring a lack of newness, choice, and ownership must by default be balanced with significantly lower prices to be considered competitive in the first place. From this perspective, radically different PSS are, by default, offerings that include such significant sacrifices that obvious reduced costs must be part of the package, as indicated by more cautious scholars (Tukker, 2015). However, it is unlikely that PSS providers would want to find themselves competing on price alone, given that the objective of servitisation and PSS is to differentiate offers through services and avoid cost-based competition.

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Overall, it appears that PSS providers can use product information to foster favourable perceptions of PSS with the exception of cost product information. This corroborates previous research on the impact of increased product knowledge through additional product information (e.g. Wang & Hazen, 2016), as well as work on the importance of information in PSS adoption (Överholm, 2017; Poppelaars et al., 2018). Following the logic of CPT, it is argued that this is achieved by setting the prospect of buying and using an unfamiliar PSS positively apart from the reference point of more traditional offers. As such, the PSS is evaluated more beneficially than without such information, and while none of the product information types exerted a significant direct effect on purchase intention, this provides evidence for the notion that reducing uncertainty during the consumer decision-making process is critical for PSS adoption (Cherry & Pidgeon).

These findings also bear on the conceptualisation of trust in the area of PSS research. In this study, trust in the provider was controlled to be high. This decision followed the observation that in previous studies, trust in the provider of a PSS was deemed important given the uncertainties consumers perceive, but it was not tested what a more trustworthy provider would actually have. Looking at the results of the product information, the matter of trust is more complex than previously anticipated, and to progress further, more refined conceptualisations of trust are necessary.

It appears that when trust in the provider is high, some product information types can change how consumers evaluate a PSS while others cannot. Even when they can, the effects are moderate at best. This indicates that a trusted provider is able to leverage this resource in some areas but not in others, which was overlooked in previous studies (Armstrong et al., 2015; Rexfelt & Hiort af Ornäs, 2009).

Continuing this train of thought, it may be inferred that consumers trusted the provider on product information that was related to their capacity to manage product-related operations. In this case, the environmental performance, the physical condition, as well as the match between the consumer's preferences and the provider's stocks of physical products is perceived by consumers to be within the control of an experienced fashion retailer. Assurances pertaining to the product are therefore perceived as true to some degree, although the low effect reflects that consumers are aware that the skills and resources required to run traditional business models to satisfactorily differ from those

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required for PSS offers, which is reflected in the difficult journeys of some providers in practice (Chian Tan et al., 2017). Looking at costs however, consumers, for either of the reasons given above, do not trust that assurances are true. It appears that providers are unable to effectively bring existing trust to bear in the area of costs.

It must be assumed that there are different trust dimensions at work here, and that companies that have developed trust capital in the area of fashion selling will struggle to transfer this to their PSS offerings. Gefen's (2002) and others' multi-dimensional understandings of trust might offer a starting point for further exploration in future research as to what kind of trust is critical and how this may be maximised to improve consumer adoption of PSS. Assuming that the previous inductive classification of product information into product- and cost-related is true, it could follow that a PSS, such as that analysed here should be provided in concert with a third party who oversees monetary transactions and acts as an impartial mediator.

6.4 Chapter Output

This chapter has discussed the findings of this study in light of relevant literature. The following findings have been generated in this chapter:

- The findings confirm several constructs previously assumed to predict purchase intentions of radically different PSS, while rejecting others.
- Overall, considerations of cost, the condition of pre-used items, and redundancy of enjoyable activities because of the service component of the PSS are relevant.
- This will allow future research to refocus on these matters in greater detail.
- PSS providers are only partially able to leverage a high degree of trustworthiness through product information.
- This indicates that more trust dimensions must be considered, and that trust transfer is an issue pivotal to PSS diffusion.

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7.1 Chapter Overview

Beyond this introductory section, this chapter is divided into four sections.

First, the thesis is summarised, and the key learning points are drawn together in 7.2, ‘Thesis Summary’. Afterwards, the outputs of this research project will be outlined in 7.3, ‘Thesis Contribution’, which is split into a sub-section on contributions to academia, 7.3.1, ‘Contributions to Theory’, and a second section on contributions to practice, 7.3.2, ‘Contributions to Practice’. Afterwards, in 7.4, ‘Study Limitations and Further Research’, the ways in which the findings of this research and their limitations enable future research to progress the field further will be demonstrated. Lastly, the main points of this chapter are summarised in 7.5, ‘Chapter Output’.

7.2 Key Findings

This thesis has investigated consumer adoption of radically innovative and sustainable PSS in the context of an environmentally disastrous industry in fashion and apparel. Based on an overview of three research oversights that have emerged in the corresponding literature on PSS adoption by consumer, two research questions were asked at the outset of the thesis:

RQ1: What are the drivers and inhibitors to consumer adoption of PSS?

RQ2: How can PSS providers leverage a trusted brand to increase consumer adoption of PSS?

After reviewing the PSS literature, three change dimensions were identified that PSS consumption would impose on consumers. These were a lack of newness, ownership and choice. The role of information and trust was assumed to be critical in overcoming uncertainties for first-time adopters resulting from these change dimensions. A

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consumer decision-making model adopted from CPT was used to inform a theoretical framework, which was combined with the case of a radical PSS from the area of fashion to form an applied framework. The PSS was based on an existing example of a niche offering, combining the previously mentioned change dimensions and may be assumed to have ample scope for environmental improvements. Adoption of this PSS was investigated quantitatively, the results of which were discussed in the preceding chapter.

Overall, it appears that, while numerous factors can be hypothesised to influence adoption intentions, only a handful are critical. The adoption of PSS, such as that investigated here, hinges on cost considerations, fears about missing out on enjoyable activities, the physical condition of the product artefacts, and liabilities resulting from having to return product artefacts. Given that both of the latter factors are tied to usership instead of ownership and, therefore, use-oriented PSS, it appears that a lack of ownership is more influential than a lack of choice. Interestingly, the result-oriented aspect of the PSS and engendered lack of choice, is not as untenable as is assumed in the literature. Instead, consumer adoption may be improved by reducing uncertainties relating to the lack of ownership and the changed relationship between user and provider instead of buyer and seller.

These findings were established under the conditions whereby a provider is highly trusted, which sets them apart from studies in which comparable PSS are offered by nameless, fictional companies. As such, consumer adoption in more realistic scenarios, whereby a large company with existing resources, industry knowledge, and market power uses servitisation to sell PSS can be explained by monetary matters to a higher degree than may be expected based on previous qualitative studies. This indicates that a high degree of trust can mitigate some of the fears and worries found in such studies.

This same trust may also be brought to bear by distributing trustworthy product information that seeks to reduce uncertainty. Both value-assuring and risk-mitigating product information can be beneficial here. The most relevant assurance, namely that consumers will make cost savings when transitioning to the PSS, shows no effect, however. This points to a problem that has not been considered previously in PSS research – trust's multi-dimensional nature and the problem of transferring trust from conventional business models and products to PSS offerings. As such, it must be

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concluded that a high degree of trust may be leveraged by a PSS provider through more specific product information, but within limits.

7.3 Thesis Contribution

Having answered the above research questions, this thesis can make several contributions to existing knowledge and address oversights described in the introduction chapter.

These contributions are divided into two categories according to their beneficiaries. First, contributions to academia will be summarised, which can be utilised by other researchers in the area to further expand the understanding of consumer adoption of PSS. Second, contributions to practice show how the findings of this study can enable professionals to make better decisions in the design and provision of PSS.

7.3.1 *Contributions to Theory*

Three gaps in literature were identified in the introductory chapter of this thesis. First, it was shown how studies of fashion, one of the areas that has progressed furthest in the discourse on consumer adoption of PSS, lack the quantitative underpinning to identify significant determinants of purchase intentions. Second, it was argued that this is also due to existing studies failing to adopt theoretical backdrops which allow for the conversion of qualitative insights into quantitatively testable models of consumer adoption. Third, the thesis summarised how the issue of trust is believed to be pivotal, while its function and nature in the adoption process remain vague. This research contributes to understanding of these three areas.

Initially, the empirical findings of this research will be of interest to researchers working on identifying the drivers for and barriers to consumer adoption of PSS. Examples of these researchers include Armstrong et al. (2015), Brun-Petersen and Riisberg (2017), Catulli et al. (2017), Catulli and Reed (2017), Cherry and Pidgeon

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(2018), Retamal (2017), Rexfelt and Hiort af Ornäs (2009), and Poppelaars et al. (2018). Both the confirmed and disproven determinants of purchase intention are of interest here, as they robustly establish which of the numerous proposed drivers and barriers of PSS adoption are actually relevant. This then allows the field to refocus on the factors that matter most. For example, based on the results of these studies it should be acknowledged that while PSS have an ambition to result in greater sustainability, this point plays a smaller role than may be believed based on previous qualitative studies. Similarly, the results show that result-oriented PSS may not be as problematic as previously assumed by Tukker (2015) and others. This is a significant finding that opens up a new area in PSS research in the consumer context, as academics have so far abstained from result-oriented cases, instead focusing on the more conventional use-oriented PSS.

This study also contributes to the understanding of consumer adoption of PSS on a theoretical level. It has been shown in the literature review how AT and PT approaches have dominated research until now as researchers sought to describe the complexities of change PSS impose upon users. While useful, these theories are more applicable to the acceptance stage than the adoption stage, and using them to structure and explain adoption is problematic. In this study, it has been established that the theoretical framework transferred from the consumer decision-making research from CPT can integrate the insight uncovered in qualitative studies and structure it to be quantitatively testable through perceived value and perceived risk constructs. Transferring the CPT principles allowed for a first step in theory testing in the area of PSS adoption that be especially relevant to researchers such as Mylan (2015), Poppelaars et al. (2018), Rapaccini and Visintin (2015), Rexfelt and Hiort af Ornäs (2009) and Tukker (2015). Beyond the distinction between perceived value and risks that can reflect insight gleaned from qualitative studies, CPT also introduces the notion of how such perceptions can be altered. In this study, it was attempted to indirectly alter the determinants of purchase intention through product information. The theoretical framework may also be used to explore how frames could alter the strength between determinants of purchase intention; for example, whether a wellbeing frame renders the relationship between perceptions of environmental friendliness and purchase intention significant. This could advance research by indicating how PSS should be positioned to be competitive in the marketplace.

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Finally, this study indicates that trust in PSS providers may have been overstated in terms of effect but understated in terms of facets until now, and this study advances this issue further. The direct implications of this study are that a high degree of trust does not alleviate all worries about perceived risks consumers might have. It appears instead that consumers may trust PSS providers in some aspects but not others. This is in line with previous research showing that trust in a brand or company is not one-dimensional; however, this has been overlooked in previous research on PSS. Researchers stressing the importance of trust, such as Armstrong et al. (2015), Catulli and Reed (2017) or Cherry and Pidgeon (2018), are therefore advised to differentiate between the sub-dimensions of trust to a higher degree. Connected to this is the notion that the problem may not only be trust in itself but also the transference of trust gained through traditional business models when offering PSS. This study is a first step towards arriving at a more differentiated understanding of the role of trust in PSS adoption.

7.3.2 Contributions to Practice

This study also offers insights applicable to PSS providers or companies wishing to expand into this area in consumer markets. These insights first emerge from the empirical results explaining purchase intention, second from the effects of product information on the determinants of such intentions, and third from the role of trust in B2C PSS adoption investigated in this project.

An initial finding is the overwhelming importance of financial concerns for the adoption of PSS such as that described here. It appears exceedingly unlikely that consumers are willing to transition from the current consumption paradigm based on newness, choice, and ownership without strong monetary incentives. While it is unclear whether the opportunity to save money remains as important beyond adoption as during acceptance, initially, providers might have to price PSS at a loss to build a customer base.

Connected to this is the matter of dependency resulting from the ongoing service-provision relationship. While, in this research, the PSS could be flexibly cancelled, its

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returns policy was designed to ensure the environmental superiority of the fashion subscription over alternatives by keeping the items in circulation. Again, it is recommended that initially the policies governing the PSS are more flexible and lenient and then adjusted at a later date. A balance will have to be struck here as more flexibility and leniency will likely result in constant attrition of products. Beyond the costs this causes for the provider and behavioural patterns that might be picked up by consumers, envisioned environmental savings will be reduced if consumers treat items with less care or buy them out. Coming to the last implication of the determinants of purchase intention, it seems that providers must identify ways of making PSS more fun. While practitioners and scholars envision the utilitarian and cool-headed consumer who buys temporary access to meet temporary needs, the pleasures of consumption should not be neglected in PSS design. Consumers' anxiety about missing out on shopping is just one manifestation of this, and new ideas and concepts are required here. One example could be to spin the choice-less aspect of PSS, commonly perceived as a risk, into an added-value, framing the receipt of new and surprising items as a monthly treat.

This is connected to the findings on product information, which was found to enable a favourable evaluation of the PSS. Information alleviating concerns about the physical condition of 'not new' products seems to be particularly relevant and it is recommended that PSS providers engage with this point. However, it is also interesting that it is difficult to convince consumers of the cost savings potential of PSS via specific information, although this is the main driver for adoption. Having the knowledge that PSS need to become more hedonic than previously anticipated, would it not be a strategic mistake to stress the 'not new' risks and financial aspects of PSS in any case? PSS providers will have to offer good value for money, and this and other studies have shown that assurances about the condition of used items help. However, it is instead proposed that these points do not become central to the marketing and framing of PSS as negative attitudes and stigmata might become exacerbated if stressed in marketing communication. As described in the previous paragraph, innovative approaches will be required to adequately position PSS in the marketplace outside of a discount niche with slim profit margins; smart consumerism (Cherubini et al., 2015) or wellbeing frames (Santamaria et al., 2016) may be the right approach after all.

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In this vein, it is also important to learn from the role that trust has played in this study. The provider of the hypothetical PSS was trusted to a high degree by consumers, yet only product-related information given by that provider affects the evaluation of the PSS, and even then only producing minor or moderate effects. The most likely PSS providers, by virtue of their resources, existing customer base, and brand recognition are not fully able to transfer trust gained in traditional business models to PSS offers. This is a significant finding and should be taken as a note of caution by large companies seeking to enter the sharing economy in markets such as fashion, automotives, or electronics. A trusted brand will not be able to overshadow perceived risks or ensure perceived values from the consumer perspective, and product information will not be sufficient in addressing uncertainties. Following on from the previous paragraph, it is proposed that perceived risks such as the physical condition worry are addressed not by the provider itself, but by an impartial source – for example, through certification. Similarly, another approach worth exploring would be to allow a third party that specialises in such matters to deal with transaction- and payment-related issues t given that the provider itself is least likely to effectively use existing trust to reduce uncertainty in the area of costs. In this case, the provider can bring his trust capital to bear in the area of perceived values and develop positive perceptions rather than attempting to mitigate negative ones.

Lastly, remembering the context of this study in sustainability of systems of production and consumption, it can be reflected that the significance of the context in which PSS and similar devices operate may not be what motivates action in practice. There are many issues within the fashion industry at every stage of the product lifecycle as explained in the introduction, but the logic underpinning this research and its findings in particular highlight that this significance does not necessarily feed through to decisions made by companies or consumers. This research however also shows that this is may not always be necessary as products and business models may be designed in ways that contribute to sustainability without having this as a costly core value proposition.

7.4 Study Limitations and Opportunities for Further Research

As with any piece of research, this work is not free from limitations, which are described in the following. However, these limitations also present opportunities to advance the area of consumer adoption of PSS and the sharing economy further and will, therefore, be supplemented with ideas for future research.

First, this study has analysed a hypothetical PSS example rather than one couched in a real-life application, which is not unproblematic. While this decision was taken out of necessity, due to the scarcity of suitable PSS in practice, and allowed for greater control, the intention-behaviour gap is well researched in the areas of environmental (Grimmer & Miles, 2017) or ethical (Carrington et al., 2010) consumption choices. This issue also applies to this research, as it can be expected that purchase intentions do not necessarily translate into purchase choices. Consumers seemingly identify increasingly more reasons not to purchase a PSS when given the time (Rexfelt & Hiort af Ornäs, 2009). It can be hypothesised that evaluation and consideration, behaviours that result in the abandonment of about 88% of online shopping carts prior to purchase (Kukar-Kinney & Close, 2010), also lower PSS purchases in real life. However, this does not render the findings of this study invalid, as the factors driving purchase intention can also be expected to be those driving actual purchases, even if their relative strength may be altered and additional factors introduced. Nevertheless, it would progress the field to identify more real-life applications of PSS to replace purchase intention with actual observed purchase behaviour to bridge this gap effectively.

Second, it was shown in the literature review that consumer adoption and consumer acceptance are not the same. While this study has been able to explain adoption to a significant extent, the factors that drive adoption may not be those that lead consumers to accept PSS in the long term. Indeed, it seems unlikely that this is the case, as the integration of PSS in practices (Mylan, 2015) or activities (Rexfelt & Hiort af Ornäs, 2009) hinges on a variety of issues, some of which the consumer may not be initially aware of. For example, in the case of the fashion subscription, one major factor influencing acceptance could be a convenient online delivery infrastructure to facilitate

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parcel delivery and returns. Such factors may not be considered to this extent during adoption, though they actually matter to the user experience on an ongoing basis. This is an essential question as unforeseen problems during use could quickly render PSS untenable even if adoption is initially widespread. Ultimately, it will be necessary to engage with consumers who have made the transition to radically different forms of consumption to find not only what makes consumers adopt PSS, but also what made them continue to choose PSS over conventional alternatives. Again, this remains difficult to achieve beyond explorative qualitative research, but there are businesses that sell PSS with some of the characteristics investigated here (e.g., Chamberlin & Boks, 2018). Access to these companies' consumers could yield fruitful research on a larger scale, similar to Catulli and Reed's (2017) study.

Third, this research has been conducted using a quantitative methodology to probe into a specific PSS with a specific consumer group in a specific product category. The choices of product category, sample, and the exact configuration of the PSS were taken deliberately to result in a realistic setting that still allows for analysis of the three major issues—lack of newness, choice, and ownership—underpinning environmentally friendly PSS. Moreover, while this approach increases validity and allows this research to contribute to one of the more pronounced strands in PSS research, there is a trade-off with generalisability. It is therefore unknown whether the determinants for purchase intention found here are the same for other product categories or populations. However, on the one hand, this presents further opportunities for research, while on the other hand, this research in itself already indicates by what such generalisability is limited. Based on these considerations (i.e., consumer preferences, product use-regimes, current consumption patterns, and the hypothesised PSS), it may be inferred that medium-term car-renting schemes for younger British men are driven by similar perceived value and risk evaluations that focus on cost savings, potential to be held financially liable for damage, and worries about the condition of the provided vehicles for example. Ultimately, further research is needed as the nexus of lack of newness, choice, and ownership has scarcely been explored before in combination, and this study shows that prospect theory can model the adoption of PSS using these features.

Fourth, even remaining in the context of the fashion subscription and the sample of young women who engage in online fashion purchasing, several issues could not be

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explored in this research. Based on previous qualitative studies the most applicable perceived value and risk dimensions were included in the theoretical framework, but others may also be relevant, and some of these were already indicated when the theoretical framework was developed in the literature review. Similarly, the effect of product information could be explored further; in this research, the available resources and resulting sample sizes proved to be limiting factors. Catulli and Reed (2017), for example, mention that concerns about the condition of used prams could be alleviated by providing independent quality certifications rather than assurances by the provider itself. On another note, based on the results of this study, it might be hypothesised that the most critical information to give would actually concern the return conditions of the clothing items. However, neither an exhaustive range of perceived value and risk constructs nor product information types or sources could be fully explored in this study, with the result that several unknowns remain. Going forward, it may be interesting to focus on the lack of choice and assess whether word-of-mouth, social media influencers, or company-provided advertisement is best to alleviate concerns around the receipt unfashionable clothing, for example.

Fifth, PSS adoption may also be explained by examining the likely consumer in greater detail, an issue that has been largely overlooked in research. In this study, respondents with some latent interest in the PSS were sampled, as opposed to a narrower, optimal sample of environmentally conscious, risk-taking, money-saving fast-fashion hyper-consumers, as the focus was elsewhere. However, it may also be hypothesised that consumers' inherent attitudes or values may be as crucial to PSS adoption as the specific configuration of the PSS itself, as investigated by Piscicelli et al. (2015) in a case of C2C sharing. Fashion libraries also seem to appeal to a specific clientele and occupy their niches with tenacity (Pedersen & Netter, 2015). Determining which consumers are more accepting as early adopters of PSS could yield insight into what must change in consumer culture to facilitate more widespread adoption. Personal values, traits, beliefs, as well as attitudes, are all worthy of further investigation.

One particularly exciting issue here remains the question of ownership, on which the literature is divided. In this research, the matter of ownership risk was measured through two constructs taken from literature, i.e., an emotional sense of loss upon relinquishing possession of an item and the financial risk associated with the return.

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Only the latter showed a significant relationship with purchase intention, which may or may not be due to the context and sample characteristics, as Armstrong et al. (2015) have found younger consumers to have more fluid perceptions of ownership. It would be worth developing a generic scale on 'preference for ownership' to measure what makes individuals more prone to favour ownership over alternatives. Based on the literature, it may be inferred that a preference for control, status, and risk avoidance are important dimensions here. Such a scale could then assess whether renting or leasing is attractive or unattractive to consumers because of beliefs held by consumers, or the specifics of the offer itself that impact on preferred use-regimes, for example. This could then significantly advance the field, as it would allow researchers to determine whether, and if so, how a consumer with an inherently strong preference for ownership can be persuaded towards ownership-less consumption.

Sixth, one question that was not fully addressed in this project is the matter of rebound effects and the paradoxes present in the hypothetical PSS proposed here, as well as those by other researchers. Should consumer interest in these offers really be driven by the swift fulfilment of temporary desires with little financial responsibility and no willingness to accept second-hand or slightly out-dated products, in terms of style, as this research indicates. Would this not lead to the further shortening of product lifecycles that is compounded with more environmental losses through the continuous re-distribution of product artefacts? In the case at hand, it could be envisioned that the most popular items include cheaply produced seasonal clothes that are cycled for two or three instances and then either recycled or sold into secondary markets because of their condition or stylistic obsolescence. Would the PSS then still result in a net benefit for the environment? Possibly, given recent data on use-regimes in fast fashion in the developed world, but is this really a significant improvement in line with what may be possible or envisioned by organisations such as the EMF? More durable product artefacts may not resonate with consumers if design or cost sacrifices must be made, especially for product categories wherein consumer culture has developed towards rapid change.

Ultimately, the difficulty of predicting and assessing rebound effects remains. If academia wishes to retain credibility, it must accept that it is simply unclear whether environmental savings will ensue from PSS, given the dynamics resulting from

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consumer behaviour. There is, therefore, scope for a variety of conceptual and simulation studies on rebound effects of PSS, such as that described here, to assess under what exact conditions environmental benefits will be achieved. A starting point would be to determine under which return policies PSS providers need only purchase new clothing once per season rather than multiple times due to attrition.

Lastly, in this project, a consumer decision-making process model based on prospect theory was used to structure the enquiry. While the choice of the underpinning theory and its reflection in the theoretical and applied frameworks was argued for based on the literature, alternative theories could have been used as well. One example here may be the theory of planned behaviour, which, based on Ajzen's (1991) early work on the theory of reasoned action. In this extension, Ajzen (1991) argues that aside from an attitude and a subjective norm that an individual reflects on, the individual also needs to perceive having the control over his own behaviour to form the intention to behave in a certain way, and then follow through with the intended behaviour in practice.

In the case of PSS consumption, it could be hypothesised that adoption hinges on the intention to do so, as hypothesised in this research as well, but that such adoption intentions hinge on the attitude consumers have towards sustainable or alternative methods of consumption, whether such methods would be supported by peers, and whether they would feel that they could and would reliably opt for such methods over alternatives. This theoretical perspective might be better able to deal with the intention-behaviour gap that has been reported in other studies on PSS adoption, which also affects this one – as a low perceived behavioural control of a consumer might mitigate transferring intentions into actual behaviour, this issue may be reduced. Similarly, as studies have found that green consumer behaviour are not only explained by considerations of an individual in is

olation but also by assumptions he makes about the consumption paradigm and environment, subjective norms conducive or resistant to green and alternative consumption such as PSS may be able to add explanatory power.

It is therefore proposed that in future enquiries different theoretical underpinnings are adopted to enrich the findings of this research and shed light on the individual itself instead of product evaluation considerations as done here.

7.5 Chapter Output

This chapter concludes this thesis. The following outputs have emerged over the course of this chapter:

- The key findings of this thesis were summarised by re-stating the research questions asked at the outset of this research project and providing two succinct answers.
- These answers allowed the three areas of oversight that emerged in PSS literature on consumers to be effectively addressed.
- As such, this study can confirm some factors driving consumer adoption of radically different PSS, while refuting others; these findings will allow researchers to redirect their focus towards what matters most to consumers.
- Prospect theory has been established as a perspective that can transfer insights from qualitative studies into quantitatively testable frameworks and the potential offered by the notion of deliberately altering prospects can open up research on consumer adoption of PSS.
- Furthermore, this study highlights that trust in provider needs to be researched with greater precision in PSS adoption.
- Several practice contributions have also been described, which are of use for companies seeking to become providers of radically different PSS.
- Several study limitations have been outlined and justified, and it has been indicated how the choices leading to these limitations also present opportunities for future research that may complement what has been found here.

7.6 On Sustainability

This research project has been conducted within the context of the continued exploitation and destruction of the earth's natural capital, on which future generations will depend for their welfare and survival. Fortunately, an increasing number of global actors are becoming aware of the importance of these issues. This study has shown that, while there are no easy solutions, there are at least feasible alternatives, even if they may require us to make sacrifices. I hope that this thesis contributes to the further development of these alternatives.

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Appendices

Appendix A: Fashion Subscription Information

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.

Figure A-1: Text used to elicit most frequented fashion brand.

Appendix A

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.

Figure A-2: Text describing the fashion subscription.

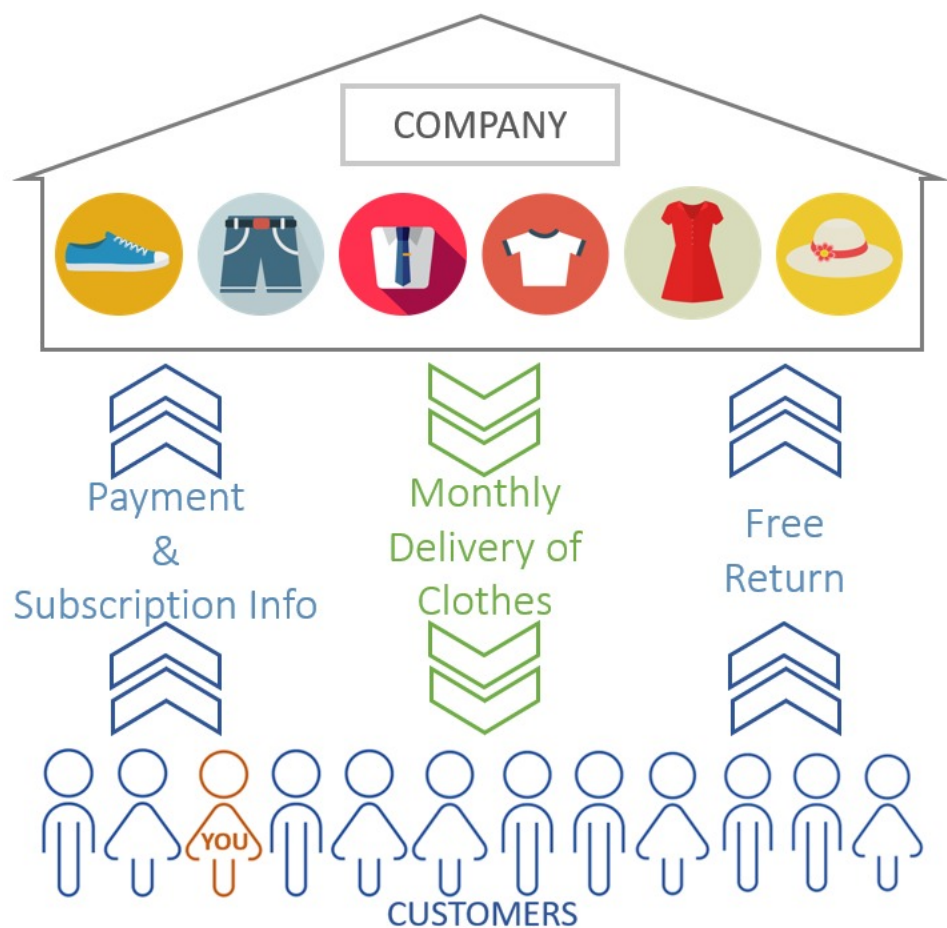


Figure A-3: Visualisation of the fashion subscription.

Appendix A

Table A-1: Product information treatments.

Cost product information	<i>[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.</i>
Environmental product information	<i>[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 reuse 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.</i>
Physical condition product information	<i>[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.</i>
Preference product information	<i>[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.</i>

Appendix B: Research Ethics



PARTICIPANT INFORMATION LEAFLET

Study Title: Making Sustainable Result-Oriented PSSs Work: A Case of Fashion Services

Investigator: Mr Steven Day, Doctoral Researcher
Warwick Manufacturing Group, University of Warwick, UK

Introduction

You are invited to take part in a study. Before you decide, you need to understand why the study is being done and what it would involve for you. Please take the time to read the following information carefully.

Please contact the investigator if there is anything that is not clear or if you would like more information using the contact information below. Take time to decide whether or not you wish to take part.

PART 1: Purpose and Conduct of the Study

What is the study about?

The purpose of this study is to find out which factors could drive consumer acceptance of sustainable result-oriented fashion product-service systems. Such product-service systems are novel and complex product bundles consisting of goods and services and are normally not offered to consumers by companies. The study takes the form of an online experiment and is further described in Point 3 of Part 1.

The study is organised by the investigator, the online experiment is hosted by *Qualtrics*, and you as a potential respondent have been contacted by *Prolific* to take part in this study.

Do I have to take part?

It is entirely up to you to decide. You are encouraged to download and read through this information leaflet and make an informed decision about your participation. You will be free to withdraw at any time during the online experiment, without giving a reason, by clicking on the "Stop without completing" button in the browser window.

Figure B-1: First page of PIL.

Appendix B

What will be expected of me if I take part?

The study takes the form of an online experiment. If you choose to take part in the study, you will be asked a series of questions, which evolve around your fashion buying choices and preferred fashion brands. Afterwards you will be presented with information about a fictional product and asked to evaluate that product using a series of questions. The amount and nature of information you will receive about this product is randomised. A last section will ask for demographic information. Your responses to these questions will be recorded.

What are the possible disadvantages, side effects, risks, and/or discomforts of taking part in this study?

No possible disadvantages, side effects, risk and/or discomforts arising from taking part in this study have been identified. The average time to complete the online experiment, excluding the reading of this participant information leaflet, is estimated at 15 minutes.

What are the possible benefits of taking part in this study?

You will be asked to evaluate a complex new fashion product, which will likely be introduced by major fashion brands in the future. The evaluation could enable you to better judge such offers and make more informed purchasing decisions in the future.

Expenses and payments

You will be compensated for participating in the study. Given that the online experiment is calculated to take 15 minutes, a compensation of £2.75 will be paid out by *Prolific* as per their terms and conditions for participation in the study. This corresponds to an hourly rate of £11.

What will happen when the study ends?

Once you have completed the online experiment, a notification will inform you that your answers have been recorded successfully and you will be referred back to the *Prolific* page.

Once the necessary number of respondents has completed the online experiment, access to the survey will be closed by the investigator. The investigator will then analyse the results using statistical techniques, the results of which may be published. Further details are included in Part 2.

Will my taking part be kept confidential?

Yes. Further details are included in Part 2.

What if there is a problem?

Any complaint about the way you have been dealt with during the study or any possible harm that you might suffer will be addressed. Detailed information is given in Part 2.

This concludes Part 1 of the participation information leaflet. If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

Figure B-2: Second page of PIL.

Appendix B

Will my taking part be kept confidential?

Your taking part in the study will be kept confidential. The gathered responses from the online experiment will be anonymised as per the terms and conditions of *Prolific* and *Qualtrics* by assigning anonymous numbers to each response – your identity will not be known to the investigator. The data set containing all of the gathered responses may be shared with the investigator's doctoral supervisors within the University of Warwick or published as described below.

What will happen to the results of the study?

The results of the study will feed into the investigator's doctoral research and thesis, which will be published. The results of the study might also be presented at scientific conferences or published in scientific journals.

Who has reviewed the study?

This study has been reviewed and given favourable opinion by the University of Warwick's Biomedical and Scientific Research Ethics Committee (BSREC): REGO-2018-2183 (4th of April, 2018).

What if I want more information about the study?

If you have any questions about any aspect of the study, or your participation in it, which are not answered by this participant information leaflet, please contact:

Mr Steven Day
s.j.day@warwick.ac.uk
07778 457659

Dr Donato Masi
Donato.Masi@warwick.ac.uk
024765 23960

Thank you for taking the time to read this participant information leaflet.

Figure B-3: Third page of PIL.

Appendix B



PRIVATE
Mr Steven Day
WMG
University of Warwick
Coventry
CV4 7AL

04 April 2018

Dear Mr Day

Study Title and BSREC Reference: *Making Sustainable Result-Oriented PSSs Work: A Case of Fashion Services* REGO-2018-2183

Thank you for submitting the revisions to the above-named study to the University of Warwick's Biomedical and Scientific Research Ethics Sub-Committee for approval.

I am pleased to confirm that approval is granted and that your study may commence.

In undertaking your study, you are required to comply with the University of Warwick's *Research Data Management Policy*, details of which may be found on the Research and Impact Services' webpages, under "Codes of Practice & Policies" » "Research Code of Practice" » "Data & Records" » "Research Data Management Policy", at: http://www2.warwick.ac.uk/services/ris/research_integrity/code_of_practice_and_policies/research_code_of_practice/datacollection_retention/research_data_mgt_policy

You are also required to comply with the University of Warwick's *Information Classification and Handling Procedure*, details of which may be found on the University's Governance webpages, under "Governance" » "Information Security" » "Information Classification and Handling Procedure", at: <http://www2.warwick.ac.uk/services/gov/informationsecurity/handling>.

Investigators should familiarise themselves with the classifications of information defined therein, and the requirements for the storage and transportation of information within the different classifications:

Information Classifications:
<http://www2.warwick.ac.uk/services/gov/informationsecurity/handling/classifications>
Handling Electronic Information:
<http://www2.warwick.ac.uk/services/gov/informationsecurity/handling/electronic/>
Handling Paper or other media
<http://www2.warwick.ac.uk/services/gov/informationsecurity/handling/paper/>.

Please also be aware that BSREC grants **ethical approval** for studies. **The seeking and obtaining of all other necessary approvals is the responsibility of the investigator.**

These other approvals may include, but are not limited to:

www.warwick.ac.uk

Figure B-4: First page of BSREC ethical approval.

Appendix B




1. Any necessary agreements, approvals, or permissions required in order to comply with the University of Warwick's Financial Regulations and Procedures.
2. Any necessary approval or permission required in order to comply with the University of Warwick's Quality Management System and Standard Operating Procedures for the governance, acquisition, storage, use, and disposal of human samples for research.
3. All relevant University, Faculty, and Divisional/Departmental approvals, if an employee or student of the University of Warwick.
4. Approval from the applicant's academic supervisor and course/module leader (as appropriate), if a student of the University of Warwick.
5. NHS Trust R&D Management Approval, for research studies undertaken in NHS Trusts.
6. NHS Trust Clinical Audit Approval, for clinical audit studies undertaken in NHS Trusts.
7. Approval from Departmental or Divisional Heads, as required under local procedures, within Health and Social Care organisations hosting the study.
8. Local ethical approval for studies undertaken overseas, or in other HE institutions in the UK.
9. Approval from Heads (or delegates thereof) of UK Medical Schools, for studies involving medical students as participants.
10. Permission from Warwick Medical School to access medical students or medical student data for research or evaluation purposes.
11. NHS Trust Caldicott Guardian Approval, for studies where identifiable data is being transferred outside of the direct clinical care team. Individual NHS Trust procedures vary in their implementation of Caldicott guidance, and local guidance must be sought.
12. Any other approval required by the institution hosting the study, or by the applicant's employer.

There is no requirement to supply documentary evidence of any of the above to BSREC, but applicants should hold such evidence in their Study Master File for University of Warwick auditing and monitoring purposes. You may be required to supply evidence of any necessary approvals to other University functions, e.g. The Finance Office, Research & Impact Services (RIS), or your Department/School.

May I take this opportunity to wish you success with your study, and to remind you that any Substantial Amendments to your study require approval from BSREC before they may be implemented.

Yours sincerely

pp. 

Dr David Ellard
Chair
Biomedical and Scientific
Research Ethics Sub-Committee

**Biomedical and Scientific
Research Ethics Sub-Committee**
Research & Impact Services
University of Warwick
Coventry, CV4 8UW.
E: BSREC@Warwick.ac.uk

[http://www2.warwick.ac.uk/services/
ris/research_integrity/researchethics
committees/biomed](http://www2.warwick.ac.uk/services/ris/research_integrity/researchethicscommittees/biomed)

Figure B-5: Second page of BSREC ethical approval.

Appendix C: Pilot Study EFA

Table C-1: Cronbach's alpha scores for constructs of the pilot study.

Construct	Number of variables	Cronbach's alpha
ValCost	4	0.937
ValVar	4	0.913
ValEnv	4	0.942
RisCon	4	0.946
RisPre	4	0.915
RisSO	4	0.916
RisRS	4	0.925
RisRL	4	0.943
PI	3	0.955

Appendix C

Table C-2: KMO and Bartlett's test for the pilot study.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy..874		
Bartlett's Test of Sphericity	Approx. Chi-Square	6,776.331
	df	595
	Sig.	.000

Appendix C

Table C-3: Communalities table for the pilot study.

	Initial Extraction	
ValCos_1	.761	.743
ValCos_2	.784	.794
ValCos_3	.836	.839
ValCos_4	.842	.846
ValVar_1	.712	.692
ValVar_2	.845	.857
ValVar_3	.620	.577
ValVar_4	.845	.884
ValEnv_1	.772	.779
ValEnv_2	.799	.829
ValEnv_3	.839	.873
ValEnv_4	.777	.765
RisCon_1	.830	.875
RisCon_2	.843	.873
RisCon_3	.744	.741
RisCon_4	.809	.836
RisPre_1	.639	.614
RisPre_2	.653	.639
RisPre_3	.848	.874
RisPre_4	.848	.871
RisSO_1	.651	.614
RisSO_2	.779	.819
RisSO_3	.759	.814
RisSO_4	.770	.782
RisRS_1	.777	.736
RisRS_2	.828	.868
RisRS_3	.730	.707
RisRS_4	.784	.806
RisRL_1	.769	.752
RisRL_2	.823	.867
RisRL_3	.807	.787
RisRL_4	.863	.869

Appendix C

PI_1	.857 .860
PI_2	.861 .901
PI_3	.893 .903

Appendix C

Table C-4: Total variance explained for the pilot study.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	10.566	30.187	30.187	10.374	29.639	29.639	4.975
2	5.088	14.537	44.724	4.893	13.980	43.620	5.860
3	3.416	9.759	54.483	3.197	9.133	52.753	5.525
4	2.514	7.183	61.667	2.322	6.635	59.388	5.097
5	2.437	6.962	68.628	2.240	6.399	65.787	5.784
6	1.832	5.235	73.863	1.641	4.688	70.475	6.883
7	1.541	4.402	78.265	1.334	3.812	74.286	5.491
8	1.364	3.896	82.161	1.182	3.376	77.663	4.720
9	.888	2.536	84.698	.702	2.007	79.669	6.287
10	.480	1.372	86.070				
11	.412	1.178	87.247				
12	.408	1.167	88.414				
13	.371	1.059	89.473				
14	.344	.982	90.455				
15	.318	.909	91.364				
16	.271	.775	92.139				
17	.258	.738	92.877				
18	.245	.701	93.578				
19	.220	.628	94.206				
20	.217	.621	94.827				
21	.182	.520	95.347				
22	.173	.493	95.840				
23	.167	.477	96.317				
24	.158	.450	96.768				
25	.142	.406	97.174				
26	.137	.391	97.565				
27	.128	.364	97.929				
28	.121	.347	98.276				
29	.114	.326	98.603				
30	.107	.307	98.910				
31	.094	.269	99.178				
32	.088	.252	99.431				
33	.077	.221	99.651				

Appendix C

34	.067	.191	99.842
35	.055	.158	100.000

Appendix C

Table C-5: Pattern matrix factor loadings for the pilot study.

	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	.660
PI 2									.930
PI 3									.888
PI 1									.853

Appendix C

Table C-6: Structure matrix for the pilot study.

	1	2	3	4	5	6	7	8	9
ValEnv 3	.933			.266		.385			.317
ValEnv 2	.906			.273		.349			.303
ValEnv 1	.877			.298		.445			.383
ValEnv 4	.872			.271		.404		-.217	.346
RisRL 4	.929	.399			.386	-.251	.458	.281	-.325
RisRL 2	.928	.293			.371	-.264	.430	.219	-.282
RisRL 3	.877	.322			.393		.465	.239	-.335
RisRL 1	.863	.323			.356	-.280	.365	.228	-.289
RisCon 1		.302	.931		.404		.299	.218	
RisCon 2		.321	.930		.483	-.205	.290	.207	-.266
RisCon 4		.351	.910		.452		.317	.294	
RisCon 3		-.204	.374	.846		.528		.321	.242
ValVar 4		.336		.936		.494		-.230	.304
ValVar 2		.309		.923		.503		-.260	.324
ValVar 1		.242		.822		.526		-.206	.389
ValVar 3				.749		.347		-.206	.247
RisPre 4		.371	.444		.931	-.362	.241		-.394
RisPre 3		.430	.480		.929	-.386	.310		-.373
RisPre 2		.301	.433		.794	-.239	.265		-.285
RisPre 1		.330	.387		.776	-.215	.228		-.342
ValCos 4		.394	-.286		.453	-.363	.914		.631
ValCos 3		.361		.475	-.282	.911			.588
ValCos 2		.387	-.269	-.207	.510	-.325	.888		.602
ValCos 1		.488	-.299	-.214	.524	-.307	.845		.589
RisRS 2		.445	.343		.320		.928	.436	
RisRS 4		.412	.273				.886	.441	
RisRS 1		.389	.354		.286	-.214	.844	.438	
RisRS 3		.415	.227		.269	-.229	.830	.397	-.234
RisSO 2		.240	.248	-.249			.406	.903	
RisSO 3		.235	.207				.429	.898	
RisSO 4		.264	.229	-.247			.402	.879	
RisSO 1		-.212	.264	-.214			.503	.755	
PI 2		.363	-.297	-.217	.339	-.423	.629		.946
PI 3		.336	-.352	-.250	.353	-.384	.674		.945
PI 1		.407	-.324	-.249	.402	-.362	.652	-.216	-.230
									.920

Appendix C

Table C-7: Factor correlation matrix for the pilot study.

Factor	1	2	3	4	5	6	7	8	9
1	1.000								
2	-.158	1.000							
3	-.142	.367	1.000						
4	.309	-.141	-.165	1.000					
5	-.126	.414	.503	-.145	1.000				
6	.439	-.278	-.181	.537	-.353	1.000			
7	-.109	.462	.339	-.069	.301	-.182	1.000		
8	-.192	.261	.267	-.261	.161	-.104	.483	1.000	
9	.375	-.340	-.247	.364	-.408	.655	-.199	-.175	1.000

Appendix C

Table C-8: CMB test using Harman's single-factor test for the pilot study.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.566	30.187	30.187	9.880	28.230	28.230
2	5.088	14.537	44.724			
3	3.416	9.759	54.483			
4	2.514	7.183	61.667			
5	2.437	6.962	68.628			
6	1.832	5.235	73.863			
7	1.541	4.402	78.265			
8	1.364	3.896	82.161			
9	.888	2.536	84.698			
10	.480	1.372	86.070			
11	.412	1.178	87.247			
12	.408	1.167	88.414			
13	.371	1.059	89.473			
14	.344	.982	90.455			
15	.318	.909	91.364			
16	.271	.775	92.139			
17	.258	.738	92.877			
18	.245	.701	93.578			
19	.220	.628	94.206			
20	.217	.621	94.827			
21	.182	.520	95.347			
22	.173	.493	95.840			
23	.167	.477	96.317			
24	.158	.450	96.768			
25	.142	.406	97.174			
26	.137	.391	97.565			
27	.128	.364	97.929			
28	.121	.347	98.276			
29	.114	.326	98.603			
30	.107	.307	98.910			
31	.094	.269	99.178			
32	.088	.252	99.431			
33	.077	.221	99.651			

Appendix C

34	.067	.191	99.842
35	.055	.158	100.000

Appendix D: Follow-up Study EFA

Table D-1: Cronbach's alpha scores for constructs of the follow-up study.

Construct	Number of variables	Cronbach's alpha
ValCos	4	0.947
ValVar	4	0.906
ValEnv	4	0.947
RisCon	4	0.951
RisPre	4	0.933
RisSO	4	0.933
RisRS	4	0.939
RisRL	4	0.949
PI	3	0.967

Appendix D

Table D-2: KMO and Bartlett's test for the follow-up study.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy..910		
Bartlett's Test of Sphericity	Approx. Chi-Square	12,431.148
	df	595
	Sig.	.000

Appendix D

Table D-3: Communalities table for the follow-up study.

	InitialExtraction
ValCos 1	.758 .743
ValCos 2	.813 .825
ValCos 3	.850 .847
ValCos 4	.869 .891
ValVar 1	.681 .730
ValVar 2	.759 .783
ValVar 3	.578 .604
ValVar 4	.781 .821
ValEnv 1	.781 .794
ValEnv 2	.820 .850
ValEnv 3	.805 .831
ValEnv 4	.801 .818
RisCon 1	.874 .912
RisCon 2	.844 .875
RisCon 3	.742 .743
RisCon 4	.825 .843
RisPre 1	.718 .722
RisPre 2	.713 .738
RisPre 3	.788 .812
RisPre 4	.828 .875
RisSO 1	.706 .689
RisSO 2	.779 .810
RisSO 3	.772 .795
RisSO 4	.828 .871
RisRS 1	.691 .660
RisRS 2	.840 .886
RisRS 3	.822 .831
RisRS 4	.824 .860
RisRL 1	.765 .754
RisRL 2	.845 .886
RisRL 3	.827 .833
RisRL 4	.833 .860
PI 1	.838 .844
PI 2	.931 .947
PI 3	.928 .948

Appendix D

Table D-4: Total variance explained for the follow-up study.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation of Sums Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	12.489	35.683	35.683	12.314	35.184	35.184	7.536
2	4.937	14.106	49.789	4.757	13.591	48.774	5.230
3	2.791	7.976	57.764	2.591	7.402	56.176	6.739
4	2.312	6.606	64.370	2.140	6.114	62.290	7.676
5	2.136	6.103	70.473	1.931	5.518	67.809	6.007
6	1.753	5.007	75.481	1.571	4.487	72.296	6.875
7	1.556	4.445	79.926	1.380	3.944	76.240	7.455
8	1.377	3.933	83.859	1.200	3.430	79.670	5.335
9	.770	2.199	86.058	.647	1.848	81.518	8.168
10	.406	1.161	87.220				
11	.380	1.086	88.306				
12	.323	.923	89.229				
13	.312	.891	90.120				
14	.286	.817	90.937				
15	.269	.768	91.706				
16	.253	.723	92.428				
17	.245	.700	93.128				
18	.224	.641	93.769				
19	.219	.626	94.395				
20	.213	.609	95.004				
21	.185	.530	95.534				
22	.180	.513	96.047				
23	.159	.456	96.503				
24	.146	.418	96.921				
25	.134	.383	97.304				
26	.129	.368	97.672				
27	.123	.351	98.022				
28	.118	.339	98.361				
29	.102	.293	98.653				
30	.098	.281	98.934				
31	.097	.276	99.210				
32	.088	.252	99.462				

Appendix D

33	.079	.226	99.688
34	.071	.203	99.892
35	.038	.108	100.000

Appendix D

Table D-5: Pattern matrix factor loadings for the follow-up study.

	1	2	3	4	5	6	7	8	9
ValCos 4	.985								
ValCos 3	.945								
ValCos 2	.887								
ValCos 1	.749								
ValEnv 2		.922							
ValEnv 4		.920							
ValEnv 3		.903							
ValEnv 1		.866							
RisCon 1			.986						
RisCon 2			.954						
RisCon 4			.912						
RisCon 3			.758						
RisRL 2				.947					
RisRL 4				.934					
RisRL 3				.907					
RisRL 1				.798					
RisSO 4					.973				
RisSO 3					.906				
RisSO 2					.874				
RisSO 1					.748				
RisRS 4						.946			
RisRS 2						.925			
RisRS 3						.916			
RisRS 1						.744			
RisPre 4							.946		
RisPre 3							.921		
RisPre 2							.845		
RisPre 1							.820		
ValVar 4								.898	
ValVar 2								.889	
ValVar 1								.797	
ValVar 3								.797	
PI 3									.933
PI 2									.906
PI 1									.828

Appendix D

Table D-6: Structure matrix for the follow-up study.

	1	2	3	4	5	6	7	8	9
ValCos 4	.941	.460	-.203	-.341			-.342	.405	.609
ValCos 3	.919	.478		-.331		-.217	-.338	.411	.591
ValCos 2	.907	.486	-.206	-.326		-.252	-.395	.403	.598
ValCos 1	.855	.474	-.212	-.335		-.250	-.396	.373	.621
ValEnv 2	.490	.921					-.212	.310	.313
ValEnv 3	.470	.910						.359	.299
ValEnv 4	.433	.901						.331	.270
ValEnv 1	.498	.888						.291	.299
RisCon 1	-.202		.953	.423	.336	.363	.463	-.228	-.361
RisCon 2	-.217		.933	.446	.303	.320	.449	-.233	-.400
RisCon 4			.915	.419	.348	.394	.476		-.357
RisCon 3	-.267		.850	.456	.335	.360	.549	-.248	-.443
RisRL 2	-.337		.436	.941	.333	.496	.469		-.502
RisRL 4	-.341		.400	.924	.320	.462	.451		-.517
RisRL 3	-.292		.431	.910	.325	.495	.450		-.493
RisRL 1	-.383		.475	.860	.361	.486	.465	-.226	-.498
RisSO 4			.303	.315	.930	.446	.306		-.309
RisSO 2			.311	.297	.894	.498	.350	-.260	-.298
RisSO 3			.324	.319	.889	.431	.346	-.240	-.275
RisSO 1			.345	.363	.822	.506	.374	-.227	-.339
RisRS 2	-.234		.374	.488	.508	.940	.401	-.238	-.356
RisRS 4			.337	.447	.491	.925	.366		-.327
RisRS 3			.357	.481	.459	.910	.369	-.225	-.321
RisRS 1	-.275		.344	.497	.424	.800	.408		-.327
RisPre 4	-.378		.469	.462	.341	.397	.935	-.215	-.446
RisPre 3	-.358		.445	.424	.347	.384	.900	-.226	-.413
RisPre 2	-.333		.473	.410	.327	.370	.855		-.369
RisPre 1	-.339		.458	.472	.336	.347	.846	-.211	-.415
ValVar 4	.396	.340	-.225			-.255	-.214	-.211	.905
ValVar 2	.402	.346						.877	.328
ValVar 1	.444	.304	-.250	-.236	-.261	-.231	-.285	.845	.444
ValVar 3	.266	.225			-.230			.771	.297
PI 3	.676	.328	-.396	-.550	-.308	-.358	-.453	.383	.971
PI 2	.692	.343	-.386	-.547	-.324	-.370	-.468	.407	.970
PI 1	.644	.334	-.429	-.496	-.339	-.334	-.445	.443	.913

Appendix D

Table D-7: Factor correlation matrix for the follow-up study.

Factor	1	2	3	4	5	6	7	8	9
1	1.000								
2	.519	1.000							
3	-.224	-.119	1.000						
4	-.367	-.152	.471	1.000					
5	-.144	-.124	.358	.359	1.000				
6	-.245	-.070	.388	.522	.521	1.000			
7	-.402	-.198	.518	.498	.382	.425	1.000		
8	.436	.354	-.243	-.187	-.256	-.229	-.228	1.000	
9	.660	.321	-.418	-.547	-.340	-.366	-.469	.411	1.000

Appendix D

Table D-8: CMB test using Harman's single-factor test for the follow-up study.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.489	35.683	35.683	11.870	33.915	33.915
2	4.937	14.106	49.789			
3	2.791	7.976	57.764			
4	2.312	6.606	64.370			
5	2.136	6.103	70.473			
6	1.753	5.007	75.481			
7	1.556	4.445	79.926			
8	1.377	3.933	83.859			
9	.770	2.199	86.058			
10	.406	1.161	87.220			
11	.380	1.086	88.306			
12	.323	.923	89.229			
13	.312	.891	90.120			
14	.286	.817	90.937			
15	.269	.768	91.706			
16	.253	.723	92.428			
17	.245	.700	93.128			
18	.224	.641	93.769			
19	.219	.626	94.395			
20	.213	.609	95.004			
21	.185	.530	95.534			
22	.180	.513	96.047			
23	.159	.456	96.503			
24	.146	.418	96.921			
25	.134	.383	97.304			
26	.129	.368	97.672			
27	.123	.351	98.022			
28	.118	.339	98.361			
29	.102	.293	98.653			
30	.098	.281	98.934			
31	.097	.276	99.210			
32	.088	.252	99.462			
33	.079	.226	99.688			
34	.071	.203	99.892			

Appendix D

35	.038	.108	100.000
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Appendix E: Comparison between Pilot and Follow-up Study

Table E-1: Descriptive statistics for perceived value items for the pilot study and follow-up study.

	Mean	Std. dev.	Skewness	Std. Error	Kurtosis	Std. Error
ValCos_1	4.34/ 4.45	1.862/ 1.746	-.379/ -.395	.174/.135	-1.065/ -.956	.346/.268
ValCos_2	4.16/ 4.33	1.851/ 1.817	-.283/ -.284		-1.122/ 1.057	-
ValCos_3	4.13/ 4.20	1.964/ 1.920	-.146/ -.163		-1.292/ 1.213	-
ValCos_4	4.02/ 4.24	1.882/ 1.870	-.074/ -.214		-1.151/ 1.125	-
ValVar_1	5.42/ 5.41	1.614/ 1.547	-1.207/ 1.237	-	.887/.987	
ValVar_2	5.61/ 5.66	1.503/ 1.379	-1.413/ 1.439	-	1.616/ 2.171	
ValVar_3	5.33/ 5.25	1.597/ 1.587	-.952/ -.943		.321/.153	
ValVar_4	5.69/ 5.69	1.432/ 1.314	-1.576/ .1398	-	2.483/ 2.221	
ValEnv_1	5.03/ 5.14	1.351/ 1.413	-.611/ -.814		.164/.404	
ValEnv_2	4.87/ 5.06	1.430/ 1.425	-.498/ -.798		-.273/.452	
ValEnv_3	4.91/ 5.19	1.400/ 1.396	-.514/ -.871		-.174/.627	
ValEnv_4	4.92/ 5.00	1.373/ 1.422	-.413/ -.669		-.364/.077	
Valid N (196/ 328)						

Appendix E

Table E-2: Descriptive statistics for perceived risk items of the pilot study and follow-up study.

	Std. dev.	Std. dev.	Skewness	Std. error	Kurtosis	Std. error
RisCon_1	4.99/ 4.63	1.606/ 1.678	-.719/ -.408	.174/.135	-.377/ -.818	.346/.268
RisCon_2	4.68/ 4.42	1.608/ 1.717	-.647/ -.217		-.500/ -1.054	
RisCon_3	5.04/ 4.79	1.527/ 1.641	-.838/ -.602		.075/ -.494	
RisCon_4	5.05/ 4.73	1.691/ 1.779	-.775/ -.536		-.282/ -.776	
RisPre_1	5.35/ 5.18	1.426/ 1.515	-.908/ -.786		.586/ 0.56	
RisPre_2	5.03/ 4.99	1.630/ 1.630	-.768/ -.799		-.244/ -.180	
RisPre_3	5.29/ 5.17	1.465/ 1.428	-.862/ -.856		.125/.227	
RisPre_4	5.27/ 5.18	1.576/ 1.501	-.955/ -.899		.248/.175	
RisSO_1	4.01/ 4.00	1.635/ 1.667	-.072/ -.077		-.926/ -1.045	
RisSO_2	4.36/ 4.34	1.802/ 1.892	-.292/ -.333		-.991/ -1.095	
RisSO_3	3.94/ 3.78	1.799/ 1.723	.002/ 0.70		-1.142/ -1.052	-
RisSO_4	4.38/ 4.20	1.879/ 1.862	-.272/ -.243		-1.160/ -1.103	-
RisRS_1	4.66/ 4.58	1.763/ 1.697	-.461/ -.409		-.746/ -.807	
RisRS_2	4.30/ 4.20	1.738/ 1.681	-.247/ -.113		-.928/ -.952	
RisRS_3	3.99/ 4.02	1.704/ 1.668	.022/ -.007		-.876/ -1.021	
RisRS_4	4.24/ 4.19	1.760/ 1.673	-.271/ -.100		-.896/ -.984	
RisRL_1	4.83/ 4.85	1.565/ 1.614	-.634/ -.669		-.504/ -.369	
RisRL_2	4.94/ 5.00	1.624/ 1.654	-.620/ -.804		-.507/ -.235	
RisRL_3	4.88/ 4.88	1.701/ 1.692	-.642/ -.670		-.542/ -.534	
RisRL_4	4.86/ 4.97	1.644/ 1.647	-.665/ -.704		-.338/ -.419	
Valid N (196/ 328)						

Appendix E

Table E-3: Descriptive statistics for purchase intention items of the pilot study and follow-up study.

	Mean	Std. dev.	Skewness	Std. error	Kurtosis	Std. error
PI_1	3.46/ 3.46	1.764/ 1.762	.068/.117	.174/.135	-1.161/ .1043	-.346/.268
PI_2	3.20/ 3.16	1.888/ 1.827	.388/.363		-1.108/ 1.106	-
PI_3	3.20/ 3.18	1.777/ 1.817	.324/.370		-.996/ -1.010	
Valid N (196/ 328)						

Appendix E

Table E-4: Age of the respondents divided into the pilot and follow-up study.

Age	Frequency:		Frequency: follow-up	
	pilot study	Percent: pilot study	study	Percent: follow-up study
18 – 22 years	36	18.4	34	10.4
23 – 27 years	51	26.0	95	29.0
28 – 32 years	50	25.5	89	27.1
33 – 37 years	39	19.9	86	26.2
38 – 42 years	19	9.7	24	7.3
Rather not say	1	.5	0	0
Total	196	100.0	328	100.0

Appendix E

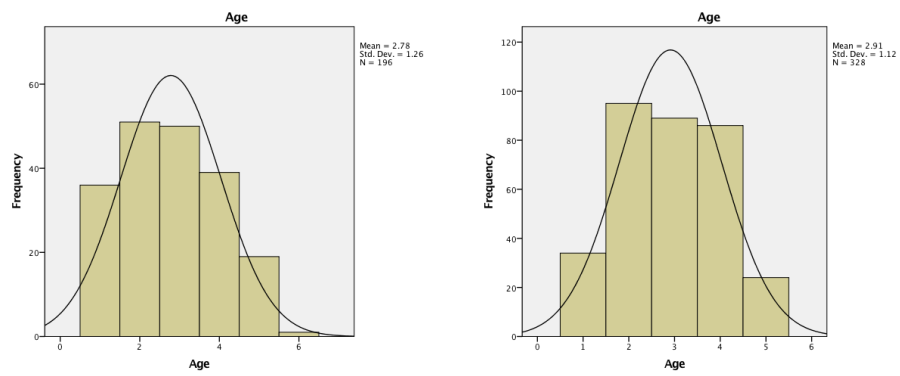


Figure E-1: Bar charts of age of the respondents divided into the pilot and follow-up study.

Appendix E

Table E-5: Education of the respondents divided into the pilot and follow-up study.

Education	Frequency: pilot study	Percent: pilot study	Frequency: follow-up study	Percent: follow-up study
No formal qualifications	1	.5	3	.9
Secondary school/GCSE	23	11.7	42	12.8
College/A levels	78	39.8	110	33.5
Undergraduate degree (BA/BSc/other)	70	35.7	116	35.4
Postgraduate degree (MA/MSc/MPhil/other)	22	11.2	52	15.9
Doctorate degree (PhD/MD/other)	2	1.0	4	1.2
Rather not say	0	0	1	.3
Total	196	100.0	328	100.0

Appendix E

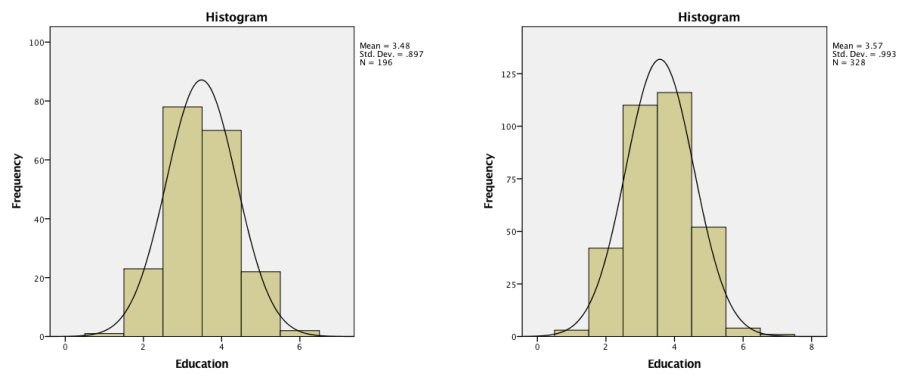


Figure E-2: Bar charts of education of the respondents divided into the pilot and follow-up study.

Appendix E

Table E-6: Income of the respondents divided into the pilot and follow-up study.

Income	Frequency: pilot study		Frequency: pilot study	
	Percent: pilot study		Percent: pilot study	
Less than £10,000	14	7.1	11	3.4
£10,000 - £14,999	14	7.1	12	3.7
£15,000 - £19,999	22	11.2	32	9.8
£20,000 - £24,999	21	10.7	29	8.8
£25,000 - £29,999	22	11.2	39	11.9
£30,000 - £34,999	27	13.8	34	10.4
£35,000 - £39,999	13	6.6	41	12.5
£40,000 - £44,999	10	5.1	17	5.2
£45,000 - £49,999	12	6.1	25	7.6
£50,000 - £54,999	6	3.1	19	5.8
£55,000 - £59,999	3	1.5	9	2.7
£60,000 - £69,999	10	5.1	10	3.0
£70,000 - £79,999	3	1.5	12	3.7
£80,000 - £89,999	1	.5	7	2.1
£90,000 - £99,999	1	.5	6	1.8
£100,000 - £149,999	3	1.5	4	1.2
More than £150,000	3	1.5	3	.9
Rather not say	11	5.6	18	5.5
Total	196	100.0	328	100.0

Appendix E

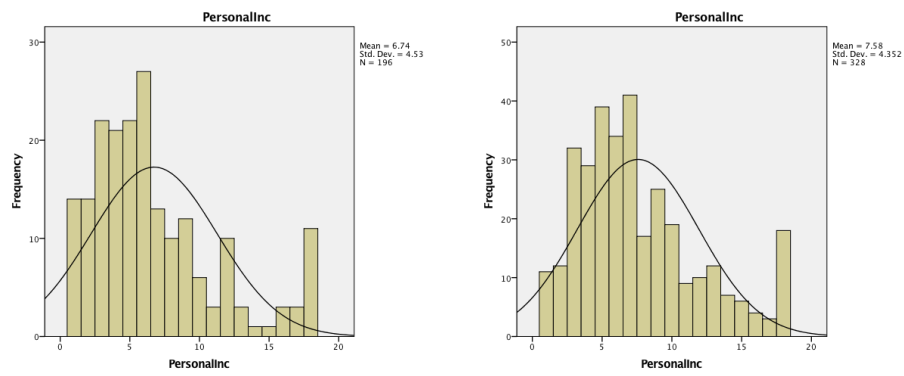


Figure E-3: Bar charts of income of the respondents divided into the pilot and follow-up study.

Appendix E

Table E-7: Named online fashion retailers of the respondents divided into the pilot and follow-up study.

Online fashion retailer	Frequency: pilot study	Percentage: pilot study	Frequency: follow-up study	Percentage: follow-up study
ASOS	50	25.5	76	23.2
New Look	20	10.2	46	14.0
Next	18	9.2	39	11.9
Boohoo.com	18	9.2	17	5.2
Other (44/ 53)	90	45.9	150	45.7
Total	196	100.0	328	100.0

Appendix E

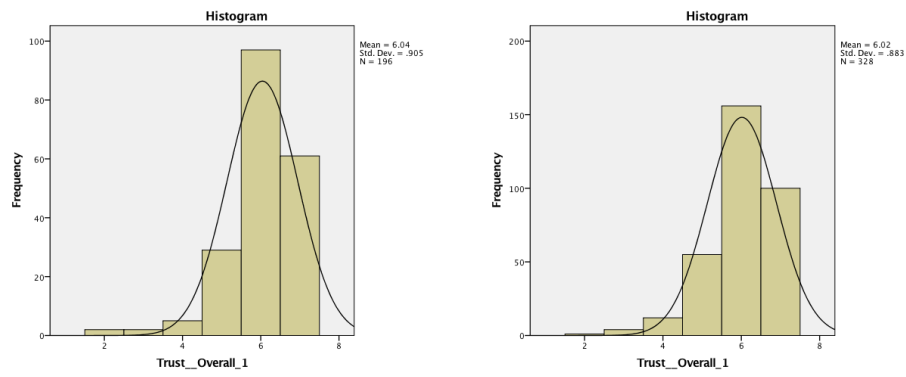


Figure E-4: Trust in the named online fashion retailer by respondents of the pilot study.

Appendix F: Combined Study EFA

Table F-1: Descriptive statistics for trust items in the combined study.

	Mean	Std. dev.	Skewness	Std. error	Kurtosis	Std. error
Trust_Int_1	5.70	.966	-1.038	.107	2.010	.213
Trust_Int_2	5.56	1.098	-1.047		1.492	
Trust_Int_3	5.65	.980	-.821		1.126	
Trust_Ben_1	5.54	1.037	-.779		1.059	
Trust_Ben_2	4.92	1.314	-.483		.030	
Trust_Ben_3	5.56	1.045	-.673		.339	
Trust_Abi_1	6.37	.755	-1.350		2.687	
Trust_Abi_2	6.36	.853	-1.851		5.432	
Trust_Abi_3	5.98	1.010	-1.297		2.190	
Trust_Over_1	6.02	.890	-1.207		2.562	
Trust_Over_2	5.54	1.249	-.967		.688	
Trust_Over_3	5.70	.991	-.642		.166	
Trust_Over_4	5.91	.946	-.885		.812	
Valid N (524)						

Appendix F

Table F-2: KMO and Bartlett's test for the combined study.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy..916		
Bartlett's Test of Sphericity	Approx. Chi-Square	18,863.558
	df	595
	Sig.	.000

Appendix F

Table F-3: Communalities table for the combined study.

	<u>InitialExtraction</u>
ValCos 1	.737 .731
ValCos 2	.791 .816
ValCos 3	.828 .838
ValCos 4	.846 .868
ValVar 1	.669 .712
ValVar 2	.767 .805
ValVar 3	.569 .593
ValVar 4	.786 .847
ValEnv 1	.760 .788
ValEnv 2	.794 .837
ValEnv 3	.801 .845
ValEnv 4	.766 .791
RisCon 1	.852 .899
RisCon 2	.836 .871
RisCon 3	.728 .738
RisCon 4	.807 .840
RisPre 1	.658 .675
RisPre 2	.665 .698
RisPre 3	.793 .830
RisPre 4	.820 .873
RisSO 1	.647 .650
RisSO 2	.755 .807
RisSO 3	.741 .795
RisSO 4	.785 .836
RisRS 1	.697 .675
RisRS 2	.819 .880
RisRS 3	.757 .771
RisRS 4	.777 .832
RisRL 1	.743 .746
RisRL 2	.823 .880
RisRL 3	.801 .812
RisRL 4	.819 .858
PI 1	.831 .849
PI 2	.893 .926
PI 3	.901 .929

Appendix F

Table F-4: Total variance explained for the combined study.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings				Rotation Sums of Squared Loadings ^a
	Total	% Variance	of Cumulative %	Total	% of Variance	Cumulative %	% Total	
1	11.746	33.561	33.561	11.560	33.029	33.029	5.119	
2	4.951	14.145	47.706	4.759	13.598	46.627	7.281	
3	2.973	8.495	56.201	2.762	7.892	54.519	6.258	
4	2.374	6.783	62.984	2.196	6.273	60.793	6.949	
5	2.233	6.380	69.364	2.027	5.790	66.583	6.779	
6	1.757	5.020	74.384	1.561	4.459	71.042	6.316	
7	1.504	4.298	78.682	1.314	3.755	74.797	5.465	
8	1.439	4.113	82.794	1.257	3.592	78.389	5.204	
9	.853	2.437	85.231	.704	2.012	80.401	7.405	
10	.407	1.164	86.395					
11	.376	1.073	87.469					
12	.339	.969	88.438					
13	.310	.885	89.323					
14	.306	.875	90.198					
15	.284	.810	91.009					
16	.273	.780	91.788					
17	.257	.735	92.524					
18	.227	.649	93.173					
19	.223	.637	93.810					
20	.206	.588	94.397					
21	.193	.551	94.949					
22	.178	.510	95.459					
23	.170	.485	95.943					
24	.162	.462	96.405					
25	.152	.435	96.840					
26	.146	.416	97.256					
27	.132	.378	97.634					
28	.129	.369	98.003					
29	.125	.359	98.361					
30	.122	.347	98.709					
31	.108	.308	99.017					
32	.102	.291	99.308					

Appendix F

33	.093	.266	99.575
34	.091	.260	99.834
35	.058	.166	100.000

Appendix F

Table F-5: Pattern matrix for the combined study.

	1	2	3	4	5	6	7	8	9
ValEnv 2	.927								
ValEnv 3	.923								
ValEnv 4	.894								
ValEnv 1	.859								
ValCos 3		.947							
ValCos 4		.942							
ValCos 2		.888							
ValCos 1		.744							
RisCon 1			.988						
RisCon 2			.947						
RisCon 4			.911						
RisCon 3			.760						
RisRL 2				.955					
RisRL 4				.927					
RisRL 3				.876					
RisRL 1				.830					
RisPre 4					.947				
RisPre 3					.912				
RisPre 2					.827				
RisPre 1					.805				
RisRS 2						.933			
RisRS 4						.927			
RisRS 3						.881			
RisRS 1						.765			
RisSO 4							.942		
RisSO 3							.914		
RisSO 2							.886		
RisSO 1							.717		
ValVar 4								.918	
ValVar 2								.896	
ValVar 3								.800	
ValVar 1								.785	
PI 2									.930
PI 3									.916
PI 1									.849

Appendix F

Table F-6: Structure matrix for the combined study.

	1	2	3	4	5	6	7	8	9
ValEnv 3	.919	.441						.323	.307
ValEnv 2	.914	.440						.299	.311
ValEnv 4	.889	.425						.310	.301
ValEnv 1	.885	.482						.297	.332
ValCos 4	.438	.930		-.320	-.352			.426	.621
ValCos 3	.435	.914		-.280	-.318			.440	.595
ValCos 2	.452	.902		-.211	-.306	-.371	-.228	.448	.601
ValCos 1	.481	.849		-.215	-.322	-.363	-.226	.438	.611
RisCon 1		.946	.378	.445	.341	.297			-.295
RisCon 2		-.215	.931	.401	.464	.311	.272	-.216	-.354
RisCon 4			.914	.393	.470	.368	.331		-.297
RisCon 3		-.239	.849	.427	.544	.348	.304	-.205	-.388
RisRL 2		-.309	.382	.937	.434	.475	.291		-.425
RisRL 4		-.307	.395	.925	.427	.464	.304		-.448
RisRL 3		-.260	.390	.897	.430	.487	.294		-.436
RisRL 1		-.344	.419	.859	.427	.446	.313		-.426
RisPre 4		-.372	.460	.428	.934	.339	.270		-.428
RisPre 3		-.369	.461	.427	.910	.358	.273		-.399
RisPre 2		-.297	.459	.371	.832	.332	.271		-.341
RisPre 1		-.296	.438	.422	.818	.305	.255		-.390
RisRS 2		-.205	.364	.474	.372	.937	.485		-.297
RisRS 4			.314	.438	.302	.909	.475		-.247
RisRS 3		-.207	.307	.461	.333	.876	.439		-.290
RisRS 1		-.251	.348	.458	.364	.815	.432		-.267
RisSO 4			.280	.298	.249	.431	.912	-.214	-.265
RisSO 2			.288	.279	.280	.467	.896	-.256	-.240
RisSO 3			.283	.287	.258	.434	.890	-.223	-.225
RisSO 1			.316	.296	.306	.507	.796	-.223	-.280
ValVar 4	.339	.438						-.245	.919 .333
ValVar 2	.333	.448						.894 .327	
ValVar 1	.282	.478	-.217		-.250			-.240	.834 .424
ValVar 3	.209	.297						-.221	.762 .280
PI 3	.332	.676	-.344	-.480	-.428	-.299	-.252	.372	.961
PI 2	.350	.669	-.323	-.455	-.450	-.289	-.254	.382	.961
PI 1	.362	.648	-.364	-.434	-.414	-.292	-.300	.428	.916

Appendix F

Table F-7: Factor correlation matrix for the combined study.

Factor	1	2	3	4	5	6	7	8	9
1	1.000								
2	.494	1.000							
3	-.134	-.212	1.000						
4	-.153	-.336	.433	1.000					
5	-.173	-.386	.517	.470	1.000				
6	-.086	-.222	.373	.508	.383	1.000			
7	-.152	-.128	.329	.325	.305	.514	1.000		
8	.342	.483	-.208	-.171	-.197	-.167	-.259	1.000	
9	.345	.663	-.360	-.477	-.449	-.306	-.283	.396	1.000

Appendix F

Table F-8: CMB test using Harman's single-factor test for the combined study.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.746	33.561	33.561	11.098	31.710	31.710
2	4.951	14.145	47.706			
3	2.973	8.495	56.201			
4	2.374	6.783	62.984			
5	2.233	6.380	69.364			
6	1.757	5.020	74.384			
7	1.504	4.298	78.682			
8	1.439	4.113	82.794			
9	.853	2.437	85.231			
10	.407	1.164	86.395			
11	.376	1.073	87.469			
12	.339	.969	88.438			
13	.310	.885	89.323			
14	.306	.875	90.198			
15	.284	.810	91.009			
16	.273	.780	91.788			
17	.257	.735	92.524			
18	.227	.649	93.173			
19	.223	.637	93.810			
20	.206	.588	94.397			
21	.193	.551	94.949			
22	.178	.510	95.459			
23	.170	.485	95.943			
24	.162	.462	96.405			
25	.152	.435	96.840			
26	.146	.416	97.256			
27	.132	.378	97.634			
28	.129	.369	98.003			
29	.125	.359	98.361			
30	.122	.347	98.709			
31	.108	.308	99.017			
32	.102	.291	99.308			
33	.093	.266	99.575			
34	.091	.260	99.834			

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35	.058	.166	100.000
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Appendix G: CFA Results

Table G-1: Measurement model factor loadings.

Item	Construct	Loading estimate
ValCos_1 <---	ValCos	.846
ValCos_2 <---	ValCos	.891
ValCos_3 <---	ValCos	.921
ValCos_4 <---	ValCos	.935
ValVar_1 <---	ValVar	.815
ValVar_2 <---	ValVar	.908
ValVar_3 <---	ValVar	.745
ValVar_4 <---	ValVar	.928
ValEnv_1 <---	ValEnv	.884
ValEnv_2 <---	ValEnv	.912
ValEnv_3 <---	ValEnv	.918
ValEnv_4 <---	ValEnv	.890
RisCon_1 <---	RisCon	.942
RisCon_2 <---	RisCon	.931
RisCon_3 <---	RisCon	.849
RisCon_4 <---	RisCon	.915
RisPre_1 <---	RisPre	.806
RisPre_2 <---	RisPre	.824
RisPre_3 <---	RisPre	.918
RisPre_4 <---	RisPre	.940
RisSO_1 <---	RisSO	.796
RisSO_2 <---	RisSO	.894
RisSO_3 <---	RisSO	.888
RisSO_4 <---	RisSO	.913
RisRS_1 <---	RisRS	.819
RisRS_2 <---	RisRS	.938
RisRS_3 <---	RisRS	.882
RisRS_4 <---	RisRS	.897
RisRL_1 <---	RisRL	.863
RisRL_2 <---	RisRL	.928

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Item		Construct	Loading estimate
RisRL_3	<---	RisRL	.903
RisRL_4	<---	RisRL	.924
PI_1	<---	PI	.911
PI_2	<---	PI	.962
PI_3	<---	PI	.968

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Table G-2: Invariance testing results.

Information treatment groups to be compared	CosT(1) vs. CosT(-1)			EnvT(1) vs. EnvT(-1)			ConT(1) vs. ConT(-1)			PreT(1) vs. PreT(-1)		
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	1,732.482	1,762.08	1,806.149	1,753.737	1,779.742	1,853.659	1,739.236	1,764.158	1,800.621	1,704.289	1,727.347	1,774.136
DF	1,048	1,074	1,119	1,048	1,074	1,119	1,048	1,074	1,119	1,048	1,074	1,119
Δ Chi-square	/	29.598	73.667	/	26.005	99.922	/	24.922	61.385	/	23.058	69.847
Δ DF	/	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
Δ RMSEA	/	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
Δ CFI	/	0	0	/	0	-0.001	/	0.001	0.001	/	0.001	0.001

Appendix H: T-Test Results

Table H-1: Descriptive statistics for the cost information treatment groups.

	CosT	N	Mean	Std. dev.	Std. e.m.
ValCos	-1	263	3.810	1.542	.095
	1	261	3.970	1.556	.096
PI	-1	263	3.103	1.745	.108
	1	261	3.118	1.762	.109

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Table H-2: Levene's Test and t-test results for the cost information treatment groups.

		Levene's test for equality of variances		t-test for equality of means							
		F	Sig.	t	df	Sig. (2- tailed)	Mean dif.	Std. error dif.	95% conf. interval of the dif.		
										Lower	Upper
ValCos	Eq. var. assumed	.086	.770	-1.186	522	.236	-.161	.135	-.426	.105	
	Eq. var. not assumed			-1.186	521.853	.236	-.161	.135	-.426	.105	
PI	Eq.var. assumed	.943	.332	-.094	522	.926	-.014	.153	-.315	.287	
	Eq. var. not assumed			-.094	521.841	.926	-.014	.153	-.315	.287	

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Table H-3: Descriptive statistics for the environmental information treatment groups.

	EnvT	N	Mean	Std. dev.	Std. e. m.
ValEnv	-1	261	4.724	1.382	.086
	1	263	5.163	1.104	.068
PI	-1	261	3.001	1.787	.111
	1	263	3.213	1.713	.106

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Table H-4: Levene's Test and t-test results for the environmental information treatment groups.

		Levene's test for equality of variances		t-test for equality of means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean dif.	Std. error dif.	95% conf. interval of the dif.	
									Lower	Upper
ValEnv	Eq. var. assumed	12.969	.000	-4.010	522	.000	-.438	.109	-.653	-.223
	Eq. var. not assumed			-4.007	496.053	.000	-.438	.109	-.653	-.223
PI	Eq. var. assumed	.880	.349	-1.349	522	.178	-.206	.152	-.507	.094
	Eq. var. not assumed			-1.348	520.705	.178	-.206	.152	-.507	.094

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Table H-5: Descriptive statistics for the physical condition information treatment groups.

	ConT	N	Mean	Std. dev.	Std. e. m.
RisCon	-1	262	4.863	1.523	.094
	1	262	4.470	1.515	.094
PI	-1	262	3.142	1.720	.106
	1	262	3.079	1.786	.110

Table H-6: Levene's Test and t-test results for the physical condition information treatment groups.

		Levene's test for equality of variances				t-test for equality of means				
		F	Sig.	t	df	Sig. (2- tailed)	Mean dif.	Std. error dif.	95% conf. interval of the dif.	
									Lower	Upper
RisCon	Eq. var. assumed	.337	.562	2.958	522	.003	.393	.133	.132	.653
	Eq.var. not assumed			2.958	521.987	.003	.393	.133	.132	.653
PI	Eq. var. assumed	.152	.696	.413	522	.680	.063	.153	-.238	.364
	Eq. var. not assumed			.413	521.266	.680	.063	.153	-.238	.364

Table H-7: Descriptive statistics for the preference information treatment groups.

	PreT	N	Mean	Std. dev.	Std. e.m.
RisPre	-1	261	4.965	1.298	.080
	1	263	4.741	1.306	.081
PI	-1	261	3.188	1.785	.111
	1	263	3.034	1.718	.106

Table H-8: Levene's Test and t-test results for the preference information treatment groups.

		Levene's test for equality of variances				t-test for equality of means			
		F	Sig.	t	df	Sig. (2- tailed)	Mean dif.	Std. error dif.	95% conf. interval of the dif.
									Lower Upper
RisPre	Eq. var. assumed	.002	.960	1.973	522	.049	.224	.114	.001 .448
	Eq. var. not assumed			1.973	521.998	.049	.224	.114	.001 .448
PI	Eq. var. assumed	.667	.415	1.008	522	.314	.154	.153	-.147 .455
	Eq. var. not assumed			1.007	520.901	.314	.154	.153	-.147 .455

Appendix I: Addressing Common Method Bias

Table I-1: Conditions that increase method bias by decreasing the respondent's ability to give accurate answers (adapted from MacKenzie & Podsakoff, 2012) and how these were addressed in this study by the author.

Conditions that cause method bias by decreasing the respondent's ability to give accurate answers	Mechanism	Potential remedies
Lack of verbal ability, education, or cognitive sophistication (Krosnick 1999; Krosnick and Alwin 1987; Schuman and Presser 1981).	May increase the difficulty of the task of comprehending the meaning of the questions, retrieving information, and making judgements (Krosnick 1991).	Align the difficulty of the task with the capabilities of the respondents by: (a) pretesting questions to ensure they are written at a level the respondents can comprehend; and/or (b) presenting the questions in audio form to augment the written form (e.g., audio computer-assisted self-administered interviewing (ACASI)).
1) Addressed through pre-screening participants to be adults from the UK. Furthermore, it was assumed that panel members have the necessary verbal and cognitive capacity to read and understand survey questions.		
Lack of experience thinking about the topic (e.g., Fiske and Kinder 1981; Schwarz, Hippler, and Noelle-Neumann 1992).	May impair a respondent's ability to answer because it: (a) hinders comprehension by reducing the respondent's ability to link key terms to relevant concepts, (b) makes information retrieval more difficult (less to retrieve, less practice retrieving), and (c) makes it harder to draw inferences needed to fill in gaps and to integrate material that is retrieved.	Select respondents who have the necessary experience thinking about the issues of interest. Exercise caution when asking respondents about the motives for their behaviour, the effects of situational factors on their behaviour, or other things pertaining to cognitive processes that are unlikely to have been attended to or stored in short-term memory.
2) This was addressed via pre-screening questions on online fashion purchases – it was assumed that consumers frequently buying fashion products online have adequate experience in thinking about the topic.		
Complex or abstract questions (Doty and Glick 1998; Krosnick 1991).	May increase the difficulty of comprehending the meaning of the questions, retrieving relevant information, and making judgements.	Avoid referring to vague concepts without providing clear examples; simplify complex or compound questions; and use language, vocabulary, and syntax that match the reading capabilities of the respondents.

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3) Vague concepts were avoided by providing clarity and detail in the description of the hypothetical PSS and the knowledge treatments, as well as augmenting it with a figure. Items had compound elements as the comparison between the hypothetical PSS and the more traditional method of buying clothing had to be made in some items. Language, vocabulary, and syntax was adapted from existing scales and focus group studies in similar contexts.

Item ambiguity (Krosnick 1991; Podsakoff et al. 2003; Tourangeau, Rips, and Rasinski 2000).	May increase the difficulty of comprehending the questions, retrieving relevant information, and making judgements. Can also increase the sensitivity of answers to context effects.	Use clear and concise language; avoid complicated syntax; define ambiguous or unfamiliar terms; and label all response options rather than just the end points.
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4) The recommendations here were implemented. Unfamiliar terms were defined by introducing the hypothetical PSS as a 'fashion subscription' and the return policy as '[Company]'s monthly return policy', giving the respondents definite terms that were fed through the measures. Contrary to the independent measures, the purchase intention scale featured only defined end points – here the author deferred to the creators of the scale with labelling who only defined end points.

Double-barreled questions (Bradburn, Sudman, and Wansink 2004; Krosnick 1991; Sudman and Bradburn 1982).	Make the retrieval task more demanding (Krosnick 1991) and introduce ambiguities into the response selection task by making it unclear whether respondents should: (a) answer only one part of the question, or (b) average their responses to both parts of the question.	Avoid double-barreled questions.
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5) Double-barreled questions were avoided. In the perceived environmental value, physical condition risk, and preference risk constructs some items included two lower order dimensions (i.e. 'natural resource and energy savings', 'damaged or dirty', 'fit me or my personal style'). Given that these dimensions both contribute to the higher order construct, this is unlikely to be an issue, but nevertheless, in the respective constructs such items were only featured twice - the later EFA will bring confirmation on whether this caused a more difficult retrieval task.

Questions that rely on retrospective recall (Krosnick 1991).	May increase the difficulty of the retrieval process and the likelihood of satisficing because questions that require retrospective recall are more difficult to answer due to the relative remoteness of the relevant information in memory.	Refocus the questions to ask about current states because this reduces the effort required for retrieval. Take steps to increase the respondent's motivation to expend the effort required to retrieve the information necessary to answer the question accurately by explaining why the questions are important and how accurate responses will have useful consequences for the respondent and/or the organisation. Make it easier for respondents to recall the information necessary to answer the question accurately.
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6) This study featured no retrospective recall.

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Auditory only presentation of item (telephone) versus written presentation of item (print or web).	Increases the memory load because respondents must keep the meaning of the question and all response options in short-term memory before responding.	Simplify questions and/or response options. Present long, complex, questions with many response options in written form or with visual aids.
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| 7) This issue did not occur since all items were written out. | | |

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Table I-2: Conditions that increase method bias by decreasing the respondent's motivation to give accurate answers (adapted from MacKenzie & Podsakoff, 2012) and how these were addressed in this study by the author.

Conditions that cause method bias by decreasing the respondent's motivation to give accurate answers	Mechanism	Potential remedies
Low personal relevance of the issue (Chaiken, Liberman, and Eagly 1989; Krosnick 1999; Petty and Cacioppo 1986).	May decrease a respondent's motivation to exert cognitive effort and result in poorer comprehension; less thorough retrieval; and less careful judgement and mapping of judgements onto response categories.	Explain to respondents why the questions are important and how their accurate responses will have useful consequences for them and/or their organisation; and/or promise feedback to respondents to motivate them to respond more accurately so that they can gain greater self-understanding, enhance self-efficacy, and improve performance.
1) This factor cannot be fully addressed as respondents in the survey have limited opportunity to improve themselves. Nevertheless, an attempt at this was made by describing the survey in the Participant Information Leaflet as bringing the opportunity to learn about new, innovative products that do not exist in practice yet, which may help them gain in experience to make better purchasing decisions in the future when products like the hypothetical PSSs might become more common. How successful this strategy was in tapping into the self-efficacy and improvement motivation of respondents is unknown.		
Low self-efficacy to provide a correct answer (Chaiken, Liberman, and Eagly 1989).	May decrease motivation to exert cognitive effort which decreases a person's willingness to assess the completeness and accuracy of information retrieved, fill in gaps in what is recalled, and trust his/her own inferences based on partial retrieval.	Emphasising to respondents that it is their personal opinions that are important, and only their personal experience or knowledge is required to answer the questions.
2) This was addressed in the survey introduction and the Participant Information Leaflet. Since the study used research panel members that likely are often respondents in surveys, this may be more or less of an issue.		
Low need for cognition (Cacioppo and Petty 1982).	May decrease motivation to exert cognitive effort and thereby diminish: (a) the thoroughness of information retrieval and integration processes, and (b) the filling in of gaps in what is recalled.	Enhance motivation to exert cognitive effort by emphasising the importance of the issues; reminding respondents of how research can benefit them or help the organisation; or increasing personal relevance of the task.
3) This point was implemented by a prompt prior to the description of the hypothetical PSS, as well as afterwards by introducing the product evaluation part of the questionnaire. Also compare 1).		

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Low need for self-expression, self-disclosure, or emotional catharsis (Krosnick 1999).	May decrease motivation to exert cognitive effort and thereby decrease (a) the thoroughness of information retrieval and (b) the filling in of gaps in what is recalled. As a result, these factors may cause people to respond to items carelessly, randomly, or nonpurposefully.	Enhance the motivation for self-expression by explaining in the cover story or instructions that “we value your opinion,” “we need your feedback,” or that we want respondents to “tell us what you think,” and so forth. Similarly, enhance willingness to self-disclose by emphasising the personal benefits of the research to them (e.g., improved performance and increased self-awareness) in the instructions.
4) Self-expression was encouraged at the beginning of the study using the language suggested. A personal benefit that could have been tapped into was to state that by participating in the survey would contribute to research on sustainability, but this would have interfered with the control for environmental product knowledge and was thus omitted. Also refer to 1).		
Low feelings of altruism (Krosnick 1999; Orne 1962; Viswanathan 2005).	May decrease intentions to exert cognitive effort on behalf of the researcher which can decrease the thoroughness of information retrieval and the filling in of gaps in what is recalled.	Explain how much the respondent’s help is needed, indicating that others are depending upon the accuracy of the responses; suggest that no one else can provide the needed information (or you are one of the few that can); and/or remind them how research can improve the quality of life for others or help the organisation.
5) This point was not addressed beyond stating that the researcher is a doctoral student, which may in itself evoke feelings of altruism, but given that participation in the study was very fairly compensated and there was limited scope to tap into altruism the remedies suggest could not be implemented in this case.		
Agreeableness (Costa and McCrae 1992; Knowles and Condon 1999).	Increases the tendency to uncritically endorse or acquiesce to statements, search for cues suggesting how to respond, and edit responses for acceptability. According to the dual process theory, acquiescence results from a premature truncation of the reconsideration stage of comprehension.	Through instructions, stress the fact that the best way to help the researcher is to answer the questions as accurately as possible. Enhance motivation by emphasising the importance of the issues; reminding respondents of how research can benefit them or help the organisation; or increasing personal relevance of the task. In addition, measure acquiescence response style and control for it.
6) This was addressed in the introduction of the questionnaire and the Participant Information Leaflet. Also see 1).		
Impulsiveness (Couch and Keniston 1960; Messick 1991).	May: (a) impair comprehension by decreasing attention to questions and instructions; (b) diminish the tendency to assess the completeness and accuracy of information	Stress the importance of conscientiousness and accuracy, and encourage respondents to carefully weigh the alternatives before responding.

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	retrieved, fill in gaps in what is recalled, and integrate the information retrieved; and (c) result in carelessness in mapping judgements onto response categories.	
7) This was addressed in the introduction of the hypothetical PSS as well as in the introduction the evaluation part of the questionnaire. Beyond this the study was fairly advertised in terms of time requirements and compensation, which was assumed to make respondents aware of how long the questionnaire would take if answered with conscientiousness.		
Dogmatism, rigidity, or intolerance of ambiguity (Baumgartner and Steenkamp 2001; Hamilton 1968).	Dogmatism (or rigidity) may heighten feelings of certainty and thus increase willingness to make an estimate based on partial retrieval; and/or draw inferences based on accessibility or to fill in gaps in what is recalled. Dogmatism (or intolerance for ambiguity) can cause people to view things as either black or white, thus increasing the likelihood that they will map judgements onto extreme response categories.	Stress the importance of conscientiousness and accuracy, and encourage respondents to carefully weigh the alternatives before responding. Measure extreme response style and control for it.
8) Extreme response styles will be addressed ex-post by looking at standard deviations of responses.		
Implicit theories (Lord et al. 1978; Podsakoff et al. 2003; Staw 1975).	May motivate respondents to edit their responses in a manner that is consistent with their theory.	Introduce a temporal, proximal, or spatial separation; and/or obtain the information about the predictor and criterion variables from separate sources.
9) This point could not be fully addressed – neither temporal, proximal, or spatial separation was possible due to resource constraints of running two separate studies with the same set of respondents, nor obtaining data on independent and dependent variables from separate sources as no corresponding source of purchase decisions or intention exist. An attempt was made by randomising the order of perceived value and perceived risk constructs before the purchase intention variables to account for implicit theories on which constructs most likely impact on purchase intentions.		
Repetitiveness of the items (Petty and Cacioppo 1986).	May decrease motivation to maintain the cognitive effort required to provide optimal answers and increase the tendency to respond in a nondifferentiated manner or stylistically.	Increase motivation by minimising the repetitiveness of the items, making the questions seem less repetitive by reversing some items (i.e., polar opposites not negations), or changing the format.
10) This point could not be fully addressed. The scales in literature share a lot of similarity in their structure, wording, and measurement scales and given that the author already adapted some items in what exactly they measure, the author did not feel confident to further alter the items' wording and structure for the purpose of being less repetitive – this trade-off will be further discussed below and in the discussion chapter. Nevertheless, the substantive content of the items differed markedly by drawing on a variety of perceived value and risk concepts ranging from monetary over product-specific attributes to activities and emotional concerns.		

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Lengthy scales (Krosnick 1999).	May decrease motivation to maintain the cognitive effort required to provide optimal answers, and result in poorer comprehension, less thorough retrieval, less careful judgement and mapping of judgements onto response categories, and/or stylistic responding.	Increase motivation by minimising the length of the survey, simplifying the questions, making the questions seem less repetitive by reversing some items (i.e., polar opposites not negations), or changing the format.
11) The total survey length was minimised as far as possible, measuring constructs by three to four variables each and only including constructs that can be backed up by literature. Questions were simplified as far as possible, using language and terms fitting the context. Also refer to 10).		
Forced participation (Brehm 1966).	May increase psychological reactance and consequently decrease the motivation to exert cognitive effort to generate accurate answers or to faithfully report those answers.	Solicit participation by promising rewards rather than by threatening punishment. Treat participants in a respectful manner, show that you value their time, and express appreciation for their participation.
12) This point was addressed comprehensively both within the questionnaire itself, the Participant Information Leaflet, as well as the compensation of participating in the study.		
Presence of an interviewer (Bowling 2005).	May motivate respondents to edit their answers to make them more socially desirable to avoid any social consequences of expressing their true judgements.	If appropriate, utilise a self-administered method of data collection (e.g., traditional paper and pencil or computer-assisted questionnaire). If this is inappropriate, assure respondents in the cover story or instructions that there are no right or wrong answers, that people have many different opinions about the issues addressed in the questionnaire, that their responses will only be used for research purposes, and that their individual responses will not be revealed to anyone else.
13) A computer-based questionnaire was used, and no picture of the researcher was presented.		
Source of the survey is disliked (Krosnick 1999).	May decrease: the desire to cooperate; willingness to exert the cognitive effort required to generate optimal answers; or motivation to faithfully report those answers.	Treat participants in a respectful manner, show that you value their time, and express appreciation for their participation. If the dislike relates to an impersonal source of the survey, you can attempt to disguise the source.
14) Refer to point 12); beyond that the researcher was introduced by name and affiliation with the University of Warwick, Coventry, UK in the survey, with a more detailed introduction and affiliation being given in the Participant Information Leaflet. It was assumed that there was no inherent 'dislike' of this affiliation present in the respondents and as such no attempt of a 'disguise' was made.		

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Contexts that arouse suspicions (Baumgartner and Steenkamp 2001; Schmitt 1994).	May motivate respondents to conceal their true opinion by editing their responses. They might do this by using the middle scale category regardless of their true feelings, or by responding to items carelessly, randomly, or nonpurposefully.	Suspicious may be mitigated by explaining how the information will be used, why the information is being requested, who will see the responses, and how the information will be kept secure. In addition, one could assure participants that their responses will be used only for research purposes, will be aggregated with the responses of others, and that no one in their organisation will see their individual responses. Measure midpoint response style and control for it.
13) Most of the recommendations here were implemented via the Participant Information Leaflet and by presenting the study as doctoral research. Controlling responses for exceptionally low standard deviations has been applied as one way of combatting this issue further. However, despite the source being made clear as doctoral research related, some respondents may have assumed that the nature of this study was driven by assessing consumer interest in a new product to make assumptions about its market success and thus being corporate profit driven research – this point could have been aggravated by the funding source in the Participant Information Leaflet being given as the WMG Supply Chain Research Group. Ultimately this could not be controlled for as it would have biased the environmental perception especially and as funding needs to be made clear to respondents for ethical reasons.		
Measurement conditions that make the consequences of a response salient (see Paulhus 1984; Steenkamp, DeJong, and Baumgartner 2010).	May increase desire to edit answers to provide a socially acceptable response or to avoid undesirable consequences.	Can be diminished by guaranteeing anonymity, telling respondents there are no right or wrong answers, and assuring them that people have different opinions about the issues addressed in the questionnaire.
14) This has been implemented via the Participant Information Leaflet; also, as stated respondents as research panel members' likely have experience in what academic questionnaires entail.		

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Table I-3: Conditions that increase method bias by decreasing the difficulty to satisfice by the respondent (adapted from MacKenzie & Podsakoff, 2012) and how these were addressed in this study by the author.

Conditions that cause method bias by decreasing the difficulty to satisfice by the respondent	Mechanism	Potential remedies
Common scale attributes (e.g., the same scale types, scale points, and anchor labels).	May heighten the perceived similarity and redundancy of items; and encourage respondents to be less thorough in item comprehension, memory retrieval, and judgement. This also makes it easier to edit answers for consistency which decreases difficulty of satisficing.	Explain to respondents that although some questions may seem similar, each is unique in important ways. Encourage them to read each item carefully. Vary the scale types and anchor labels and/or reverse the wording of some of the items to disrupt undesirable response patterns.
1) This point could not be fully addressed, compare 10) of the previous table.		
Grouping related items together.	May heighten the perceived similarity and redundancy of items; and encourage respondents to be less thorough in item comprehension, memory retrieval, and judgement. This also makes it easier to edit answers for consistency which decreases difficulty of satisficing; and makes it easier to use previously recalled information and prior answers to respond to the current question.	Disperse similar items throughout the questionnaire, separated by unrelated buffer items.
2) The two recommendations were not followed in this study – the second would have increased the study time, which would require more resources, and potentially increased respondent fatigue to what is already a taxing questionnaire due to the memory recall necessary because of the fashion subscription description and knowledge treatments. The first point was not implemented because dispersing the 32 perceived value and perceived risk items (35 if the purchase intention items would have been included) would have had a similar effect on respondent fatigue and memory recall. Given that most of the measures used were modified and untested in their current wording, it was preferred to accept a higher ease of satisficing and potentially inflated internal consistency over fatigued, unengaged respondents.		
The availability of answers to previous questions (physically or in memory).	This may make it easier to: (a) use previously recalled information and answers to respond to the current question (i.e., judgement referral); and (b) provide answers that are consistent with each other or with an implicit theory.	Memory availability can be diminished by introducing a temporal separation between the measurement of the predictor and criterion variables; and the diagnosticity of the previous answers (as a cue to how to respond) can be diminished by introducing a psychological separation. Physical availability can

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	be diminished by restricting access to previous answers.
3) Please refer to Point 9) of the previous table on separation of independent and dependent variables. Access to previous answers was not restricted in the survey, but items related to each dependent and independent construct were shown on separate pages.	