Juana Camacho-Otero

Redrawing the circle

Integrating a consumption perspective
into the circular economy

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Doctoral Thesis

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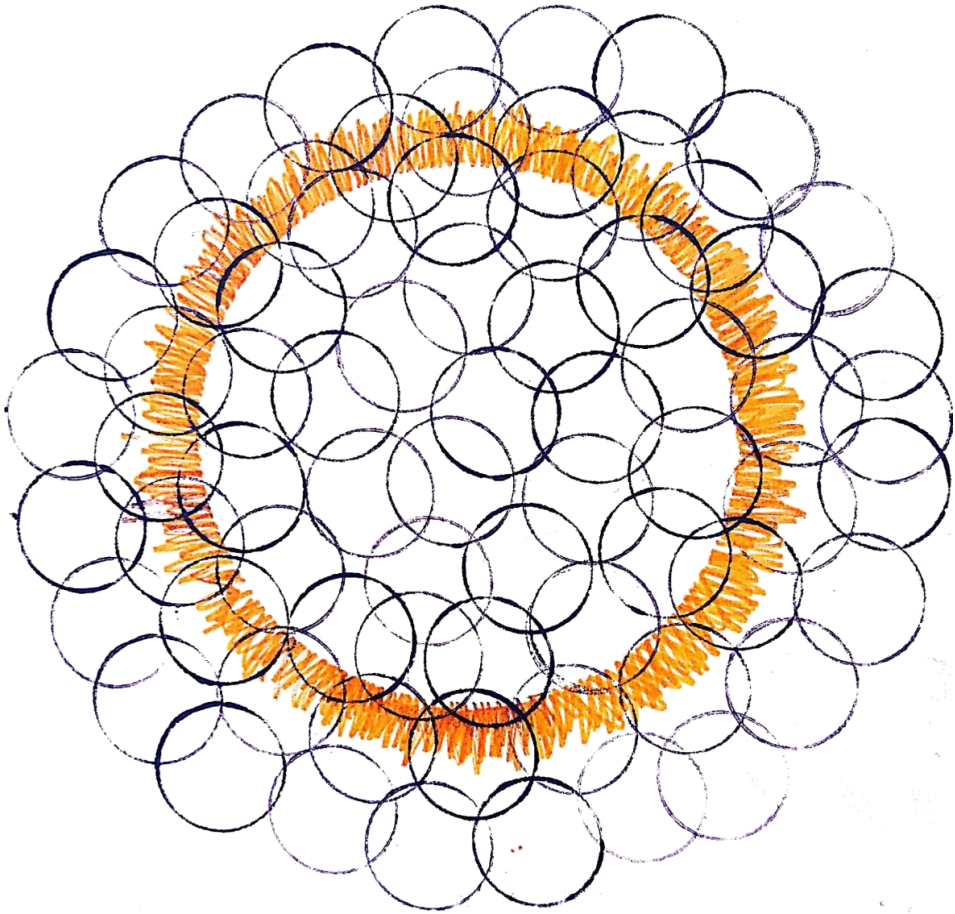
Juana Camacho-Otero

Para Carmen, Guillermo, Felipe, Nia y Thiago, mi familia…

Abstract

In 2018 and 2019, social protest in France and Ecuador against measures designed to disincentivize fossil fuel production illustrated how sustainability measures that do not consider consumption aspects can result in violent backlash from society. Citizens in both countries decidedly opposed measures to eliminate fossil fuel subsidies because of the short-term implications in their livelihoods. Even though these measures were aligned with a vision for a low-carbon future, their implications for consumption were too significant that had to be rolled back by the government. This simplified example illustrates how sustainability initiatives do not need to be only technically feasible and desirable for businesses and governments. They also need to consider citizens in their role as consumers. With the rise of the circular economy, an initiative that aims at improving resource efficiency and thus, sustainability, a significant amount of research has been conducted about how businesses, cities, countries and regions can transition towards a circular future. Business models have been defined. Regional strategies have been created; national policies have been produced. Such interest has also reflected in the extension of scientific research conducted addressing production aspects, primarily.

In contrast, work considering consumption aspects has been limited. Existing definitions of the circular economy do include the concept of consumption or specifically indicate that it is enabled by responsible consumers, besides business models. However, not much has been done describing what the circular economy means for consumption processes for consumers and policy initiatives supporting sustainable consumption. This lack of consideration of the consumption side of the circular economy results in the creation and development of solutions and interventions that may not address consumer needs, which can prevent the diffusion of circular offerings and intervention.

This research project aims at expanding the knowledge about consumption in the specific context of the circular economy, and it does so by providing insights into three aspects. First, what are the implications of circularity for the consumption process? Second, what are the factors and conditions that enable the acceptance and the adoption of circular offerings by consumers? Moreover, lastly, how design tools for circularity incorporate consumption and consumers considerations that can help them create solutions that have a user perspective.

The thesis comprises six studies addressing these three topics. The first study answers the question about the extent of research around consumption and consumer issues for the circular economy and specific circular solutions. Because one of the arguments recent research about the circular economy suggests the lack of consumer acceptance and adoption is that there is not enough knowledge on the topic. Hence, the first step of this project was to assess to what extent this statement was accurate by conducting a systematic literature review of the state of the art. Studies 2, 4 and 5 address the third research question about factors and conditions for acceptance and adoption by consumers. Studies 2 and 5 focus on consumer acceptance factors for two product categories, clothes and toys while study 4 addresses conditions and processes of adoption for a circular practice, clothes swapping, using a social practice perspective. It specifically explored how swapping as a circular practice emerged and how it attracted practitioners in a specific socio-economic setting.

The third study addresses the concern of what are the implications of circularity for the consumption process by using input from actual users of existing circular offering in a specific

product category. I chose to work with clothes as the fashion sector has a significant potential for improving resource efficiency through circular economy solutions. The study focuses on understanding and describing the different moments a consumer goes through when consuming a use-oriented product-service system and identifying different opportunities for business designers to enable circulation. The last study addressed the question about how circular design tools can integrate these concepts of the consumption process, consumer acceptance factors and adoption of circular practices. It provides suggestions and recommendations on what should be considered when creating tools for developing circular offerings. It was an analysis of five tools available today using the framework resulting from the previous studies.

Based on these six studies, it was found first that contrary to what available circular economy reviews suggest, there is a significant amount of research addressing consumption and consumer aspects in the context of circular solutions. Less has been done regarding the circular economy concept, as it emerged more recently, and research is growing. Second, the consumption process in the circular economy is not only about acquiring, using and disposing of products as suggested before, but it includes additional moments of appropriation, appreciation, devaluation and divestment within the using moment of consumption. Because of this, if materials and products need to circulate, companies, designers and policymakers should use this understanding of an extended consumption process to map intervention opportunities to enable circulation.

Third, the process by which the circular economy and circular offerings are going to become mainstream and diffuse in society consists of at least two moments, acceptance and adoption. Acceptance refers to the positive intention people have regarding engaging with specific circular offerings and in general, with the circular economy. Several aspects need to be considered, to improve acceptance, including economic, psychosocial, cultural and socio-material. However, the intention is not going to translate into adoption, necessarily, mainly because of circular offerings' characteristics. Consequently, it is necessary to zoom out from the individual to the practice level and see how circular offerings become part of social practices and how those practices are going to attract people to engage with the circular offering. Based on the analysis conducted, for a circular offering to become part of a social practice, the elements of the old practice need to change, and the links between such elements need to break in order to make space for the circular offering. The new practice needs to be spread in society, and people need to be exposed to it. If a new practice attracts practitioners depends on the capitals and histories of potential carriers as well as on the links with other practices. Thus, these elements need to be considered when creating interventions to support the adoption of circular offerings. By having this dual approach, a zoom-in approach, that looks into the individual aspects that drive acceptance and a zoom-out approach to look for the conditions that enable circular offerings to become part of a practice and thus being adopted, circular economy stakeholders can better integrate relevant consumption and consumer considerations.

Finally, and after assessing existing design tools for circularity, it was found that some of them do consider some of these aspects, but not all. This finding is surprising since Design is user-centric and context-specific. However, the available tools are more focused on the production and technical process and do not guide how to engage consumption and consumer aspects. It is suggested that circular design tools acknowledge there is a consumption process for the solution they are creating by using the six-moment consumption process, so they can identify what it is that the consumer needs to do concerning their solution. Second, they need to zoom in to that consumer or consumers and investigate consumer profiles and understand the four

groups of factors suggested. Then they should zoom out and investigate the context of the circular offering and see what elements characterize the practice that serves as the context for the offering (the images, skills, material). It is also essential that they understand how the linkages between those elements can be intervened to facilitate. First, the integration of the offering into the context and second, they must find ways for that new practice to recruit people.

This research has several limitations. Data was collected from different geographies, different product types, so the insights are not transferable to other products and geographies. However, this was not the aim of the research, but to provide insights that can be used as guidance for further research. The studies could be replicated for different product categories and geographies to compare results and identify similarities and differences. The last research question is limited to providing recommendations, but a prototype was not developed. However, there are opportunities to create tools that incorporate these recommendations in the future. Only two ontological perspectives were used, one based on the individual and the second one on social practices.

Nevertheless, in consumption other approaches are focusing on social structures. This research project did not use them because its objective focused on the dimensions that can be addressed by designers, product and service designers for example. Structural change happens at ample time and spatial scales that go beyond the influence space for single designers, companies or governments. However, these theories have essential contributions to the discussion about transitions towards the circular economy and consumption that need to be considered but were beyond the scope of this research.

Preface

This thesis is submitted to the Norwegian University of Science and Technology (NTNU) for partial fulfillment of the requirements for the degree of philosophiae doctor.

This doctoral work has been performed at the Department of Design, NTNU, Trondheim, with Prof. Casper Boks as the main supervisor and with co-supervisor Ida Nilstad Pettersen.

Acknowledgements

This thesis marks the end of a personal journey back to academia that started in 2013. Back then, I wanted to explore alternative ways to address environmental challenges in my country. Since 2005 I had been working as project manager for different sustainable initiatives in conflict-torn regions. By investing in small farms, such projects aimed at protecting highly biodiverse regions. I worked for an organization that had significant resources to support local communities and create sustainable livelihoods.

Nevertheless, we had to compete with mining and oil companies who offered them ten times the investments we made to buy their land. Naturally, most of these families took the money and sold their land including the forest which we were trying to protect. The scarce funding for protecting the forest paled against the investment capital of extractive industries. Then, I decided that in addition to protect the forests, we should also address the causes behind the threats to the forest, i.e., unsustainable consumption patterns.

That was my main motivation for starting this path. It began with an M.Sc. in Industrial Ecology in Austria and Sweden, as an Erasmus Mundus grantee. There, I discovered that sustainable consumption was an evolving field of research that had already yielded alternatives that could soon make mining in highly biodiverse areas obsolete. However, I also learned that one of the main barriers to succeeding was the lack of consumer demand. Surprisingly, it seemed to me that industrial ecology researchers were not addressing such an issue. After a break that took me back to Colombia to work with the national government, I came back to Europe to enroll in this Ph.D., which addresses that very same question.

This journey has not been what I was expecting. I started it full of confidence as the experienced professional I am, thinking it would be easy. I would tell myself, "If I have been able to achieve what I have achieved so far, a Ph.D. must be a piece of cake." Boy, was I wrong! Quickly I realized that a Ph.D. is one of the most challenging things one can do because it confronts you with yourself every day and makes you question everything. It is lonely, it is full of self-doubting and your biggest accomplishment is a 10-pages article that most likely no one will read. And yet, I do not regret it in one bit. During this Ph.D., I got to acquire and develop skills I didn't know I needed, I learned how to find questions that needed answers, I learned how to address them adequately, how to investigate previous knowledge and the world to find suitable answers. I learned to think critically, to present my findings to expert audiences, I learned how to argue for and against statements. I learned to assess quality research and to provide constructive feedback to my peers. And above all, I learned how to write 😊.

All these outcomes would have not happened without the constant support from my supervisor Casper Boks who apparently trusted I would deliver from the very beginning. That kind of trust was very helpful. I also acknowledge my co-supervisor Ida Nilstad Pettersen who always had alternative perspectives and guiding questions that improved my own understanding of the theory. Lucy Chamberlin, my PhD-sister, who was there all along this journey to discuss and hang out. I was lucky enough to be part of the Circ€it Training Network which brought together amazing early-stage and senior researchers that gave me feedback at least twice a year and with whom I created wonderful memories.

Naturally, I also want to acknowledge my co-author Anneli Selvefors, who is one of the young researchers interested in this topic. Also, I would have not able to complete this thesis without

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Appended Publications

Journal publications

Paper 1 (P1): Camacho-Otero, J., Boks, C., Pettersen, I.N., 2018. Consumption in the circular economy: A literature review. Sustainability. 10. https://doi.org/10.3390/su10082758

Paper 2 (P2): Camacho-Otero, J., Boks, C., Pettersen, I.N., 2019. User acceptance and adoption of circular offerings in the fashion sector: Insights from user-generated online reviews. Journal of Cleaner Production. https://doi.org/10.1016/j.jclepro.2019.05.162

Paper 3 (P3): Camacho-Otero, J., Pettersen, I.N., Boks, C., 2019. Consumer engagement in the circular economy: exploring clothes swapping in emerging economies from a social practice perspective. Sustainable Development. https://doi.org/10.1002/sd.2002

Conference papers

Paper 4 (P4): Camacho-Otero, J. (2019). Consumption in the circular economy: expected consumer behaviours and activities. In J. Segalàs & B. Lazzarini (Eds.), Proceedings of the 19th European Roundtable for Sustainable Consumption and Production Circular Europe for Sustainability: Design, Production and Consumption. Barcelona.

Paper 5 (P5): Camacho-Otero, J., Selvefors, A., Boks, C., 2019. Circular design tools: (how) do they understand the consumer? in: Product Lifetimes and The Environment. Berlin.

Paper 6 (P6): Camacho-Otero, J., Boks, C., Pettersen, I. N., 2018. Changing the game: consumer perceptions and factors of acceptance for circular solutions in the toy sector. Manuscript developed based on the abstract presented at the 23rd International Sustainable Development Research Society Conference. Messina.

1. Introduction

Sustaining current levels of per capita consumption in industrialized economies and helping emerging economies lift their growing populations out of poverty require significant quantities of resources (Bringezu et al., 2017). In a recent study of household consumption environmental impacts, Ivanova et al. (2016) estimated that 60% of global GHG emissions and between 50% and 80% of total land, material and water use resulted from household consumption. Considering this situation, different actors such as the United Nations Environment Programme, the European Union and the World Economic Forum have suggested resource efficiency as one of the strategies that can contribute to transforming unsustainable consumption and production practices (European Commission, 2017; United Nations Environment Programme, 2017; World Economic Forum, 2012). Bringezu et al. (2017, p. 50) recommended that such transition includes "(a) technological, organizational and social innovations that foster savings (such as reducing resource use - including changing citizen behavior - in high-consumption countries); (b) reuse and recycling of products and materials (such as keeping resources within the economic system for longer); and (c) an orientation towards service provision (including focusing on providing functions instead of physical products)."

1.1. *The circular economy*

The concept of the circular economy has recently become an umbrella term comprising different strategies that contribute to reducing resource use, reusing and recycling products and to the expansion of service provision. The current concept is the result of the accumulation of different ideas and notions from the fields of environmental economics (Ghisellini, Cialani, & Ulgiati, 2016), industrial ecology (Frosch, 1992) and sustainable design (Ceschin & Gaziulusoy, 2016; McDonough & Braungart, 2002). Research from the field of sustainable consumption has also explored concepts that today are closely associated with the circular economy, such as Product-Service Systems (Halme, Jasch, & Scharp, 2004; Heiskanen & Jalas, 2003; Meijkamp, 1998; Mont, 2000). In the early 2010s the Ellen Macarthur Foundation launched their report, building on these contributions and providing a definition of the circular economy:

> "[…] an industrial economy that is restorative by intention; aims to rely on renewable energy; minimizes, tracks, and eliminates the use of toxic chemicals; and eradicates waste through careful design. The term goes beyond the mechanics of production and consumption of goods and services in the areas that it seeks to

redefine (examples include rebuilding capital, including social and natural, and the shift from consumer to user). The concept of the circular economy is grounded in the study of non-linear systems, particularly living ones." (Ellen MacArthur Foundation, 2013, p. 22)

Despite the widespread enthusiasm the concept has raised among different actors, researchers from disciplines such as industrial ecology and working on topics such as sustainable consumption have raised some concerns. For example, Zink and Geyer (2017) alerted about the risk of rebound effects when efforts to close material loops are made only at the company level. O'Rourke and Lollo (2015) and Welch et al. (2017) highlighted that most popular definitions of the circular economy fail to tackle continued growth in a resource-limited world, one of the main drivers of unsustainability. Thus, its ability to fulfill its goal of reducing environmental pressures could be limited. Finally, Li et al. (2010) warned against the possibility of circular economy strategies of being more energy-intensive than the alternative.

1.2. Value propositions contributing to circularity

The literature on business models defines value propositions as the offering companies provide to the different market segments they serve, at its basic level, it is the bundle of products and services (Osterwalder, Pigneur, & Tucci, 2005). A circular value proposition has been defined as one that "is based on utilizing economic value retained in products after use in the production of new offerings." (Linder & Williander, 2017, p. 183). The recent literature on the circular economy suggests that innovative business models such as product-service systems -PSS-, collaborative consumption, and sharing platforms are examples of circular value propositions that can contribute to improving resource efficiency (Lewandowski, 2016). These business models may include in their offerings recycled, remanufacture and pre-owned products as well as new (Bocken et al., 2016).

PSS is a "pre-designed combination of products and services in a market that can fulfill consumer's needs; and a dematerialized solution to consumer needs and preferences; a result of rethinking of the product value chain and ways of delivering utility to customers that will have a smaller environmental impact than separate products and services outside the system" (Mont, 2000, p. 36). Later, (Tukker, 2004) suggested that there are at least three types of PSS which have differentiated environmental consequences: product-oriented, use-oriented, and results-oriented. The main characteristic of PSS is that ownership of the product stays with the provider rather than transferring it to the consumer (Baines et al.,

2007). Thus, the product can have multiple use cycles. PSS is a form of access-based models as defined by Bocken et al. (2016).

Collaborative consumption is also considered as contributing to the circular economy by different actors (Europe, 2014; Gullstrand Edbring, Lehner, & Mont, 2016). Collaborative consumption is also part of the sharing economy (Hamari, Sjöklint, & Ukkonen, 2016; Pedersen & Netter, 2015; J. Schor, 2014). Collaborative consumption activities enable the extension of a product's lifespan by allowing for multiple ownership cycles. Examples of collaborative consumption activities include swapping, consignment trade and peer-to-peer sharing activities (Park & Armstrong, 2017; Pedersen & Netter, 2015). Both initiatives diverge from traditional consumption models as they challenge ideas of ownership and newness, which is a crucial aspect of the circular economy, to disrupt traditional forms of economic activity, i.e., the linear economy.

1.3. Consumption issues as barriers to the transition

A significant barrier for the circular economy to deliver reduced environmental impacts is low consumer and market acceptance of circular offerings, as illustrated by Zink & Geyer (2017). Kirchherr, Hekkert, et al. (2017) found that the lack of consumer interest and awareness is a "main impediment regarding a transition towards CE" (p. 7) after surveying businesses in Europe. In a similar study, Rizos et al. (2016) reported the same complaint coming from small and medium enterprises trying to move towards circular business models and solutions. They indicated that the "lack of support from demand networks" prevented the implementation of green innovations such as circular business models.

Nonetheless, even when consumers expressed their interest and support for circular initiatives, adoption of such has been slow. Following on such realization, Rizos et al. (2017) further elaborated on the role consumer behavior plays in the transition to the circular economy. Even though, there is some awareness about the role of consumption in facilitating the transition to a circular economy, Kirchherr et al. (2017a) found that only 19% of the papers defining the circular economy addressed this issue.

Authors from fields that are considered today as contributing to the circular economy, such as Product-Service Systems (PSS), servitization and remanufacturing, have indicated that lack of consumer acceptance is a topic that needs more attention. Sakao et al. (2009) suggested that areas such as value creation, business models in a B2C context, all required further research. Tukker (2015b) confirmed previous findings that PSS might not be readily

accepted by consumers and highlighted the lack of quantitative analysis on the topic. More recently and from a servitization perspective, Baines et al. (2016) echoed Sakao et al. previous suggestions for further research in areas such as value co-creation, customer acceptance and customer behaviors in a B2C context.

1.4. Research Questions

This doctoral research aims at addressing these concerns by exploring three topics, consumption, the circular economy and design, and their relations (see Figure 1). Specifically, this research is interested in understanding:

- RQ1: To what extent do circular value propositions change the consumption process?

- RQ2: What factors and conditions enable or hinder the acceptance and adoption of circular value propositions?

- RQ3: What consumption aspects need to be considered in design tools for the circular economy?
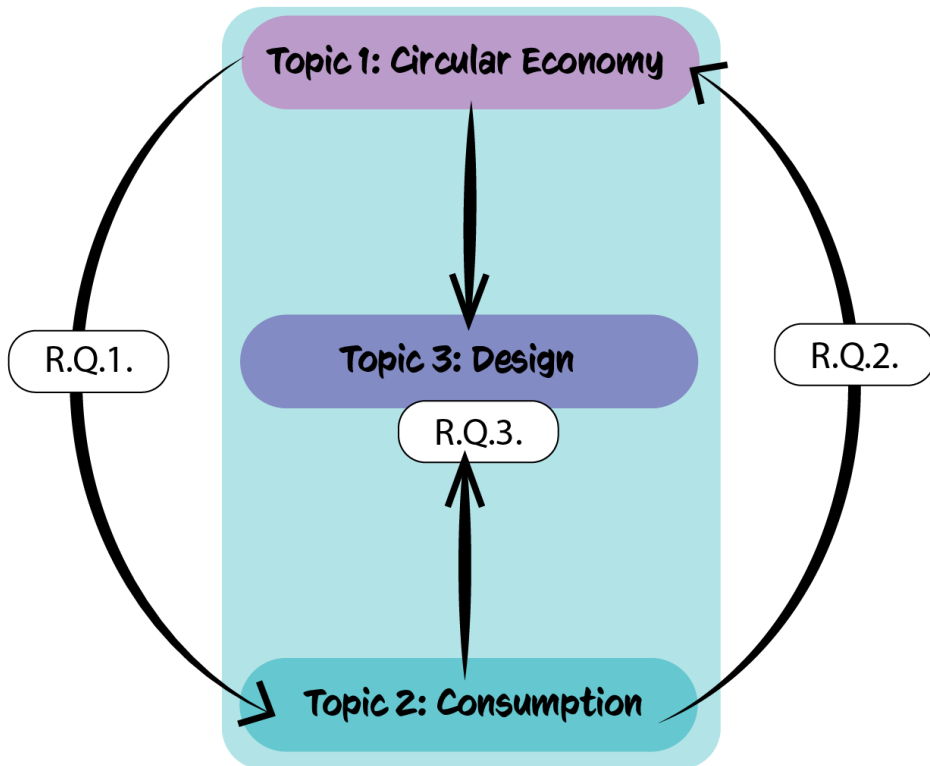
Figure 1 Topics and research questions

1.5. Scope

This thesis focuses on two circular strategies, access-based offerings, and extending product value through collaborative consumption. These types of solutions where chosen because they belong to the tightest cycles of the circular economy as they enable reuse, and therefore have a higher potential for enabling resource efficiency (Ellen MacArthur Foundation, 2013). Within access-based consumption, it investigates use-oriented Product-Service Systems. Regarding collaborative consumption, it explores swapping practices. Section 3.1.3 further elaborates on these concepts.

Other strategies, such as extending resource value, classic long-life model and sufficiency-based offerings, were not included because of several reasons. Extending resource value translates into recycling and optimization strategies, which are the least desired activities in the circular economy if a waste

hierarchy is followed. The classic long-life model does not significantly challenge consumption as it is based on traditional business models of the type product-oriented PSS (Tukker, 2015). Finally, sufficiency offerings, as characterized by Bocken, seem to overlap with the classic long-life model, and consequently do not challenge consumption patterns. Moreover, although sufficiency is a suitable option for societies where absolute reductions of resource consumption are required, it is not adequate in other socio-economic contexts where consumption will have to increase.

1.6. Research Design

This research is situated within a pragmatic worldview, as opposed to purely post-positivistic or constructivist paradigms. A pragmatic worldview combines elements from these perspectives to answer questions related to what and how. In practice, such an approach translates into the type of questions asked in this research project, as stated in section 1.3.

Figure 2 presents a visual description of the doctoral research project regarding studies and publications. It comprises six studies that address the three research questions described in the previous section. Results from the different studies were presented and published in different articles as described in the figure as well.
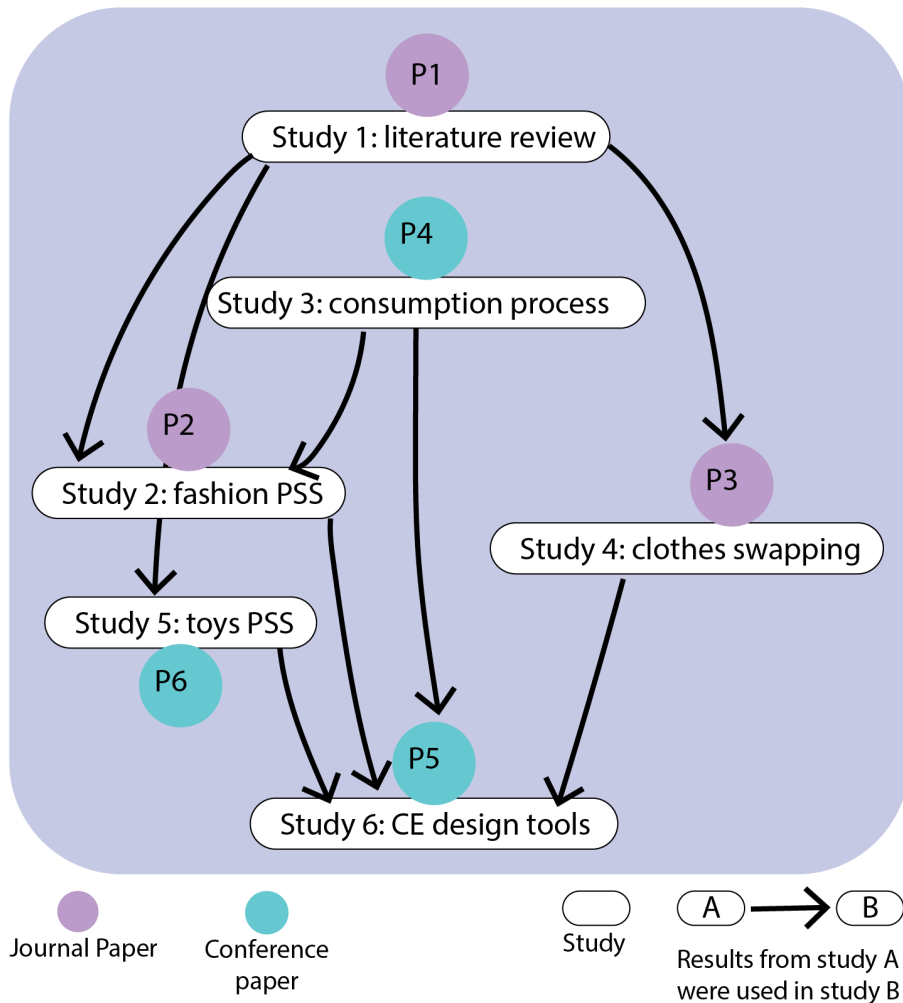
Figure 2 Research design, studies, papers and contributions

Study 1 surveyed existing scientific literature on consumption, consumers, the circular economy, and specific circular offerings. This study provided the basis for identifying the main topics, theories, methods used in the studies reviewed and the research gaps. Findings from this study were presented in Paper 1. Studies 2 and 5 investigated user acceptance based on the findings from study 1 for clothes and toys in industrialized and emerging economic settings. Their findings were presented in Papers 2 and 6, respectively. Study 3 used the data

initially collected in study 2 for empirically exploring the changes brought by circularity to the consumer journey. Results from this study were presented in Paper 4. Study 4 was based on one of the theoretical perspectives identified in Study 1 regarding consumption dynamics, social practice theory, and investigated the conditions that enabled swapping to become a circular consumption practice in an emerging economy. The results of this study were presented in Paper 3. Study 6 collected the theoretical insights gathered in studies 2 to 5 to build a framework for analyzing existing circular design tools and identify opportunities for improvement. Findings were presented in paper 5.

1.7. The Circ€it Marie Curie Innovative Training Network

This doctoral research project is part of the Circular European Economy Innovative Training Network - Circ€it-. The goal of the Circ€uit Network is to train 15 young researchers in the field of Circular Economy. Its mission is to develop a cohort of future leaders in research, policy, and business through an innovative training program focused on an interdisciplinary approach to Circular Economy. The project combines five perspectives around the circular economy: business models, supply chains, users, design and systems. This doctoral research project is part of the work package 3, addressing the users and corresponds to Early Stage Research 7.

The network's expected outcomes include:

1. Acquiring new insights to improve our understanding of PSS and circular business models and to help overcome the hurdles on the product or system level;

2. Developing PSS business model innovation across Europe, supporting the economic development while at the same time reducing the ecological burden;

3. Creating a sustainable and cross-disciplinary network of trained experts who will have the skills, qualifications, and professional connections to drive future innovation in the realization of Circular Product Service Systems;

4. Connecting industry and academia in training ESRs to develop new approaches to PSS, which will help businesses to compete, create growth and innovation.

Although this doctoral research project started from the basis formulated in the initial project, it broadened its scope to not only consider acceptance but also adoption, and it includes different socioeconomic contexts.

2. State of the Art

The content in this sub-chapter is an adaptation of (Camacho-Otero, Boks, & Pettersen, 2018) *included in this thesis.*

The first step in this doctoral research project was to conduct a literature study to synthesize main insights from research related to consumption, consumers in the (explicit) context of the circular economy in a reproducible and transparent way. This literature study (Study 1) aimed at providing a critical perspective on the available academic work on these topics. Following the criteria provided by Boote and Beile (2005) to conduct a satisfactory literature review, this review had two objectives. On the one hand, it aimed at identifying the gaps in the literature that need to be filled and on the other hand, it meant to assess the practical and scholarly significance of the contributions.

The study included three stages, planning, conducting, and reporting (Tranfield, Denyer, & Smart, 2003). Figure 3 illustrates the different steps taken that lead to the review of 111 scientific articles. Each article was analyzed using a double-cycle coding strategy as defined by (Saldaña, 2009).
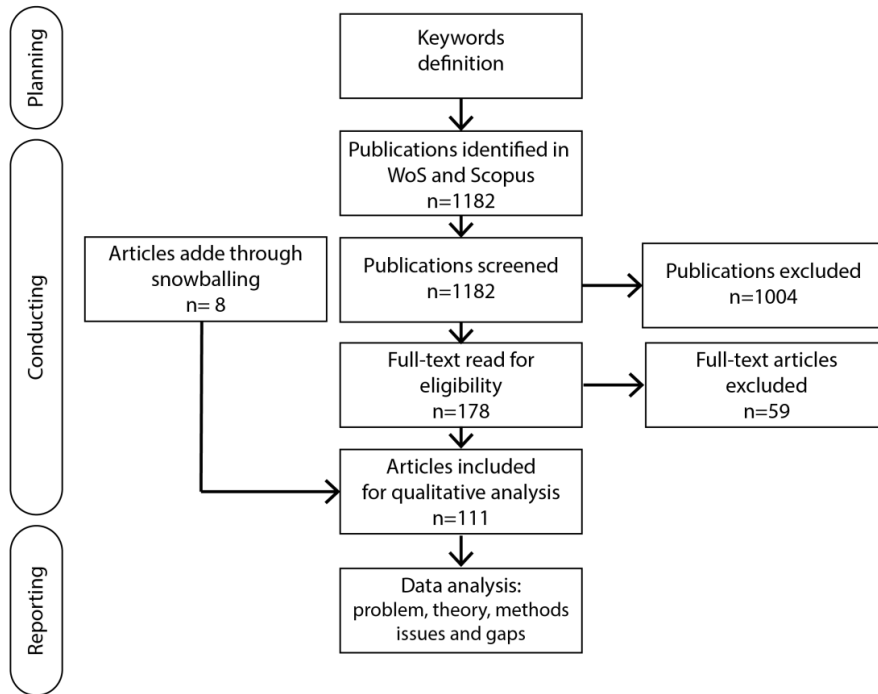
Figure 3 Systematic literature review process. Based on Tranfield et al. (2003)

During the planning stage, a set of keywords was defined.

Table 1 describes the terms used for the web search. Publications from the two most relevant scientific publications databases, Scopus, and Web of Science, were included.

Table 1 Search terms for the first cycle

Topic	Search terms		Topic	Search terms
Circular Economy	"circular economy"			
Product Service Systems	"product service systems" OR "servitisation" OR "eco-efficient services"	**AND**	Consumption	"consumption" OR "consumer" OR "User"
Remanufacturing	"remanufacturing" OR "remanufactured"			

	OR "closed-loop supply chain"	
Sharing economy and collaborative consumption	"sharing economy" OR "collaborative consumption" OR "product reuse"	

Each article reviewed was analyzed in terms of five dimensions, as presented in Table 2. These dimensions were selected considering the objectives of the literature study, i.e., to identify gaps to be filled and assessing the practical and scholarly significance of the contributions analyzed. To address the first objective of the study, the articles were analyzed regarding the problem or topic they focused on their findings and the gaps they identified. The second objective was achieved by exploring the theoretical underpinnings used in the existing literature as well as their methodological approaches.

Table 2 Literature review analytical dimensions

Dimension	Description
Problem Addressed	The issue the study explores, the research questions posed by the article.
Theoretical Frameworks	The disciplines and theories used in the study to analyze the data collected.
Methods and Tools	Methodological approaches and tools used by the researchers to collect the data.
Issues	The answers the studies get to their research questions, including the list of factors explaining user and consumer acceptance, the nature, meaning, and dynamics of consumption, as well as the description of how design processes included consumption consideration
Research Gaps	The aspects that researchers suggest need further investigation.

The literature reviewed addressed three main topics, as described in Table 3, consumption nature, meanings and dynamics, consumption drivers, and user perspectives in the design process. The following paragraphs describe and discuss the main problems addressed in the literature and main findings which inform this doctoral research project.

Table 3 Literature reviewed by topics and themes

Topic	Theme	Description	Number of papers	% of the literature reviewed
Consumption nature, meanings, and dynamics	Consumption dynamics	This theme refers to the papers that aimed at explaining how the process of consumption changes in the context of circular solutions	9	19%
	Nature of consumption	These articles reflected on what makes consumption of circular solutions different from the consumption of other types of offerings.	6	
	Meaning of consumption	This theme groups papers that explored how consumers understood consumption in the context of specific circular offerings	7	
Consumption drivers	Factors (barriers, drivers, motivators)	Includes articles exploring the antecedents of consumer acceptance as well as the barriers that prevent consumers from adopting the circular solutions included in this review	72	74%
	Consumer perceptions	Without explicitly identifying antecedents or factors for acceptance, these papers focused on consumers' attitudes towards circular solutions.	7	
	Consumer typology	This category includes articles that aimed at providing profiles or typologies of consumers concerning the characteristics of circular solutions.	2	
	Incentives for acceptance	This group includes studies that investigated external strategies that could help improve the acceptance and adoption of circular solutions.	2	
User perspectives in the design process	Design process	These papers investigate how the consumer or user was integrated into the design process of specific circular solutions	6	7%
	Theoretical inquiries	These papers provided frameworks to introduce the consumer perspective in the design process of circular offerings based on previous findings.	2	

2.1. Consumption in the circular economy

As most definitions of the circular economy suggest, both production and consumption need to change if a more resource-efficient economic system is to be achieved (Geissdoerfer, Savaget, Bocken, & Hultink, 2017). Articles in this group investigate how consumption, understood as a complex and situated social phenomenon, changes in the context of a circular economy and circular value propositions. Reviewed publications focus on two topics, the nature and meanings of consumption and the processes through which consumption becomes circular.

2.1.1 The nature and meanings of consumption

Based on the qualitative analysis of the literature addressing this problem, five aspects seem to characterize consumption in the circular economy and of circular offerings: anonymity, connected consumption, the multiplicity of values, political consumerism and uncertainty (For a list of articles see Table 4).

Table 4 Main themes in the reviewed literature about nature and meanings of consumption

Aspect	Authors
Anonymity	Bardhi and Eckhardt, 2012; Park and Armstrong, 2017; Philip et al., 2015
Connected consumption	Albinsson and Perera, 2012; Ballús-Armet et al., 2014; Bardhi and Eckhardt, 2012; Briceno and Stagl, 2006; Geiger et al., 2017; Huber, 2017; Mont, 2004; Petersen and Riisberg, 2017; Philip et al., 2015; Vaughan et al., 2007; Welch et al., 2017
Multiplicity of values	Ballús-Armet et al., 2014; Binninger et al., 2015; Catulli et al., 2017; Mylan, 2015; Philip et al., 2015; Santamaria et al., 2016; Vaughan et al., 2007; Welch et al., 2017
Political consumerism	Bardhi and Eckhardt, 2012; Park and Armstrong, 2017
Uncertainty	Briceno and Stagl, 2006; Catulli et al., 2017 Catulli et al., 2017; Geiger et al., 2017; Park and Armstrong, 2017, Bardhi and Eckhardt, 2012

According to the literature reviewed, consumption may become more anonymous in the context of the circular economy, especially for access-based models. Bardhi and Eckhardt (2012) indicated that in the case of car-sharing and accommodation services, in which usage is private, consumers might avoid

knowing who the previous user was. In contrast, they argue, more public forms of usage such as toy libraries knowing where toys come from, may help trust. Anonymity is also influenced by the level of connection an offering requires. If a service does not need people to connect with others, the more anonymous it can become. Park and Armstrong (2017) build on this approach to anonymity and explore it in the context of collaborative consumption offerings in the apparel sector, which are considered here as circular. They agree with Bardhi and Eckhardt that access-based consumption or utility-based non-ownership models may have high anonymity.

Nevertheless, and at the same time, new relationships among consumers and with companies may develop as well, resulting in more profound forms of engagement and involvement. Similarly, authors suggest that community and interaction among consumers may also become relevant (Albinsson & Perera, 2012; Briceno & Stagl, 2006; Huber, 2017). Reciprocity, sociability and interaction may become vital aspects and are realized through networks and sharing activities. Such settings could facilitate the establishment of institutions that can enforce agreements and trigger commitment by participants (Mont, 2004). Usually, such characteristics arise from initiatives that come from the bottom up, rather than top-down. Specific forms of collaborative consumption such as swapping and consignment, may require interaction between consumers and tighter connections among them (Park & Armstrong, 2017).

Although for some authors, functionality provides the basis for circularity (Ellen MacArthur Foundation, 2013), solutions that only rely on offering functional value may not be as attractive as others that offering meaning (Catulli et al., 2017; Philip et al., 2015). Thus, if promoters of the circular economy want to attract consumers, they should not dismiss other types of values such as hedonic or symbolic. As illustrated by Binninger et al. (2015), when exploring collaborative consumption discourses, suggested that people's motivations to participate in these offerings navigate between the individual and collective focuses and utilitarian and hedonic motivations.

Additionally, and as suggested by Bardhi and Eckhardt (2012), Binninger et al., (2015) and Philip et al. (2015), some consumers of circular offerings may perceive such solutions as a form of rebellion against mainstream consumption and engaging with them is expected to reflect a political stance. In the past, material consumption was perceived as a sign of status; however, utilization-based consumption as opposed to ownership-based, is likely to become the norm in the circular economy.

Finally, and because in the circular economy, products only move temporarily from producers to consumers and then return to continue their journey with other consumers, issues of trust, risk, and control arise. Thus, efforts to formalize such 'liquid' relationships are fundamental to reassure both parts in the transaction. Knowledge and information are also expected to address such concerns.

2.1.2 Dynamics of consumption

The literature investigating the dynamics of consumption in the context of the circular economy, i.e., the conditions by which circular solutions attract participants and retain them, is sparse compared to the group above. This category includes publications that address the question about the processes and conditions that have enabled transformations in consumption patterns to include circular offerings.

Earlier studies investigated how non-ownership consumption modes influenced more efficient ways of transportation and mobility, finding that by introducing car-sharing services, fewer cars were used by a group of consumers (Meijkamp, 1998). This approach differs from more recent research in that it looks at the innovation as the medium to change consumption practices towards resource efficiency, rather than the innovation being the endpoint. They specifically explored the role of innovative offerings, or as they called it "consumption technologies" in changing consumption behaviors, cars use mileage and use of public transportation.

Using a broader approach, Mont (2004) investigated "critical factors that affect institutionalization of existing alternatives to unsustainable patterns and levels of consumption" (p. 136). In this pursuit, Mont offered a delimitation of the central contradictions linear consumption patterns entail. In the most traditional economic tradition, the material consumption is argued to satisfy human needs, enable happiness, display a certain level of status, and identity creation. However, as shown in early and more recent research, these assumptions are at least problematic (Vita et al., 2019). Thus, less-material intensive consumption could be a viable alternative, according to Mont. The institutionalization of low-material intensive practices is needed to change consumption patterns. Such a process of institutionalization depends on two aspects, regulation supporting such consumption practices and new normative institutions that embrace circular solutions. Mont argues that the latter was not in place in the moment of her research in the early 2000s.

Briceno and Stagl (2006) provided empirical support to some of the arguments by Mont by exploring how Product Service Systems (PSSs) came about in the UK context. The authors argued that different aspects should be considered when analyzing the potential of alternative forms of consumption to become a general practice. Such elements include their "capacity to fulfil needs, their ability to promote innovative ideas and products, the amount of trust in the system, and satisfaction participants are getting through the programmes" (p. 1546). In their analysis, they found that because they helped create a sense of community and contributed to creating social capital, they were able to attract participants and establish themselves among specific groups. In contrast, aspects such as coordination inefficiencies and lack of participation threatened these practices.

In recent research, Mylan et al. (Mylan, 2015; Mylan, Holmes, & Paddock, 2016) investigated the processes by which innovative offerings of the type PSS and concepts grounded in the circular economy, can diffuse in society, by using social practice theory. Their approach suggests that diffusion of circular offerings such as PSS is the result of the practice dynamics, the strength of the linkages among a practice's elements, and the connection of the practice to other practices. To empirically explore these aspects, the author analyzed the uptake of new lighting and laundering practices.

This research offered three main insights regarding the uptake of circular offerings by using a social practice perspective. First, new products transform consumer needs rather than meet them. Consequently, consumption is the result of a coevolution process among practice elements. Second, innovative offerings will have a harder time becoming part of social practices that have strong links. Furthermore, the diffusion of innovative offerings would be easier for practices that are not linked to other practices. In her later work, Mylan draws on a similar theoretical framework to investigate what shapes patterns of resource use in every day and use such insights to understand how circular practices can become part of household consumption.

Following a similar line of inquiry Huber (2017) used social practice theories to explore the emergence of innovations such as collaborative consumption and processes of recruitment. Recruitment, as defined by Shove et al. (2012), is the process through which a practice recruits practitioners or carriers, people that perform the practice. Using social practice theory, Huber, suggests, on the one hand, that innovations emerge when a practice is reconfigured through changes in its elements. On the other hand, he provides an account of why a social practice recruits or expels practitioners through the idea of opportunities of

embodiment. The author suggests that "embodiment, understood as an individual's achievement of practical know-how or practical consciousness (Wallenborn and Wilhite, 2014 cited by Huber), varies according to (1) the frequency of exposure to a practice (2); the match with available capitals and embodied practice 'histories'; and (3) the fit into existing arrangements of practices" (p. 59). He uses this framework to explore collaborative consumption initiatives.

Table 5 summarizes the different approaches to understanding consumption dynamics in the context of circular offerings and the circular economy.

Table 5 Conditions for the change and diffusion of circular practices

Process	Conditions	Authors
Changes in practices	New elements are introduced in the practice	(Meijkamp, 1998; Mont, 2004; Mylan, 2015; Mylan et al., 2016)
	(Re)configuration of interlinkages between elements	(Briceno & Stagl, 2006; Huber, 2017; Mylan, 2015; Petersen & Riisberg, 2017)
	Connections with other practices	(Huber, 2017; Mylan, 2015; Mylan et al., 2016)
Diffusion	The institutionalization of the consumption practice	(Mont, 2004)
	Recruitment to the new practice	(Huber, 2017)

Work on how consumption patterns change is mostly grounded in sociological approaches. They conceptualize consumption as a social, collective and dynamic process. The literature on consumption dynamics in the context of the circular economy and circular offerings focuses on understanding how consumption practices and patterns change, and how innovative forms of consumption attract people. Changes in consumption practices are the result of transformations in material elements such as technologies or products and immaterial aspects such as understanding, norms, rules, and relationships. Changes in the linkages between elements may translate into changes in consumption practice; the weaker the links, the easier the transformation. Novel forms of consumption recruit people as the result of the opportunities to embody these new practices, which in turn depend on the level of exposure to the new practice, the alignment among different types of capitals and histories, and the alignment of the new practice with existing arrangements.

2.2. Circular consumption drivers

Most of the articles reviewed address the question about what motivates changes in consumption. Within this topic, research primarily addressed topics

such as factors influencing consumer acceptance, consumer perceptions of circular offerings, types of consumers, and incentives to improve acceptance.

Factors of acceptance refer to the elements that influence the consumer's intention to take part in circular offerings such as purchasing remanufactured products, using product-service systems, and participating in sharing activities. Studies exploring consumer perceptions investigated attitudes expressed by different consumers towards circular offerings and the circular economy without identifying antecedents or acceptance factors. Research on consumer types offered sets of characteristics that could guide marketing efforts for circular offerings, while research on incentive focused on how to attract the different types. This study summarized the findings regarding the factors influencing consumer acceptance, based on the thematic analysis conducted. These factors were grouped under different topics. Even though these categories are presented separately for purposes of clarity, they are not independent.

2.2.1. Personal characteristics

The first category of factors is personal characteristics. These refer to the values people hold such as materialism (Akbar, Mai, & Hoffmann, 2016; Bucher, Fieseler, & Lutz, 2016; Catulli et al., 2013; Davidson, Habibi, & Laroche, 2017; Lawson, Gleim, Perren, & Hwang, 2016), the need for uniqueness (Akbar et al., 2016; Lang & Armstrong, 2018), desire for change (Armstrong, Niinimäki, Lang, & Kujala, 2016), product and user involvement (Bardhi & Eckhardt, 2012; Lee & Kim, 2018; Philip et al., 2015), control and self-efficacy (Bardhi & Eckhardt, 2012; Baxter & Childs, 2017; Gruen, 2017; Khor & Hazen, 2017; Roos & Hahn, 2017; Wang, Wiegerinck, Krikke, & Zhang, 2013), sense of status (Catulli et al., 2013; Catulli, Cook, & Potter, 2016; Catulli & Reed, 2017; Lawson et al., 2016; Mont, 2004; Wilhelms, Merfeld, & Henkel, 2017) and sense of community (Albinsson & Perera, 2012; Möhlmann, 2015).

The reviewed literature on materialism provides two opposing views regarding the role of materialism in the intention to participate in access-based consumption or sharing systems. On the one hand, researchers such as Akbar et al. (2016) and Bucher et al. (2016) found that possessiveness, a component of materialism, negatively influences the intention to participate in sharing offerings, or has a minimal role. On the other hand, Davidson et al. (2017) and Lawson et al. (2016) suggested that materialistic consumers may be attracted to sharing offerings as they address underlying motives to possessiveness.

Other personal characteristics that seem to support engagement in circular offerings include the need for uniqueness, which Lang and Armstrong (2018)

conceptualized as the desire for differentiating oneself from others through purchasing, using, and discarding goods. This construct is connected to the idea of novelty which enables consumers to distinguish themselves from their peers. Gullstrand Edbring et al. (2016) considered the desire to be unique as one of the drives for people to engage in the circular economy, particularly when participating in offerings to rent furniture. Closely related to the need for novelty is the desire for change (Armstrong, Niinimäki, Kujala, Karell, & Lang, 2015) as a driver for participating in circular offerings or the opposite, resistance to change (Rexfelt & Hiort af Ornäs, 2009).

Involvement was also considered in the literature reviewed as an essential personality factor that influences acceptance. Product involvement has been used to refer to the importance assigned to the product by the individual in their daily live (Bardhi & Eckhardt, 2012; Philip et al., 2015) while user involvement refers to the level of interest in an activity and the affective response related to that interest (Lee & Kim, 2018). These studies explored the relationship between the level of product and user involvement with the intention to participate in access-based consumption and sharing economy activities.

Researchers indicated that control and self-efficacy drove consumers' intention. These two aspects refer to the perception consumers have regarding decision-making in the context of circular offerings. Authors such as Bardhi and Eckhardt (2012) argues that people perceive they have little control over access-based offerings because they have given up ownership. Moreover, because people like to feel in control, they may refrain from using such offerings (Jiménez-Parra, Rubio, & Vicente-Molina, 2014; Johnson, Mun, & Chae, 2016; Khor & Hazen, 2017; Michaud & Llerena, 2011).

Status has been associated with possessiveness and materialism, as owning things is perceived as a sign of wealth and power in the context of consumer cultures (Mont, 2004). Lawson et al. (2016) found that people with low intention to participate in sharing activities were the ones with higher scores in status consumption, suggesting that circular offerings of such types are not perceived as giving status. However, and with a contrasting result, Wilhelms et al. (2017) found that some participants in peer-to-peer car-sharing schemes in Germany, do it because it offers them status. Beyond status, authors such as Albinsson and Perera (2012) suggested that people pursue offerings based on collaborative consumption because they enable people to expand their networks and become part of a community: "our analysis indicates that the nexus of value has expanded to include not only the goods and services but

also the interactions between the individuals who participate in the giving and receiving." (p. 308).

2.2.2. The product and service offering

The second set of factors influencing people's attitude towards the circular economy and circular offerings groups aspects connected to the product and the service. Five factors influencing consumers' attitudes towards these two aspects emerged from the articles reviewed, product quality, product longevity, product-need fit, the technology used to deliver the offering and the design.

Product quality is significantly relevant for remanufactured products (Hazen, Mollenkopf, & Wang, 2016; Michaud & Llerena, 2011) as the perceived lower quality of remanufactured products is one of the main drivers for lack of acceptance. Perceived quality is a construct connected to perceived functional and cosmetic risk (Abbey, Kleber, Souza, & Voigt, 2017). Service quality was investigated by Möhlmann (2015) as an antecedent to satisfaction with a sharing option and the likelihood of using a sharing option again. In her study, Möhlmann found evidence supporting the positive connection between service quality and satisfaction but not with the likelihood of using again. Abrahao et al. (2017) also considered quality in their study of reputation systems in the context of sharing services and found that it is indeed an antecedent for acceptance.

In his seminal work, Schrader (1999) suggested that long-lived products such as cars and white goods would have a better chance to be included in eco-service offerings based on access. More recent publications have suggested that longevity should be a characteristic of circular possessions in the sense that they should last for several use cycles (Baxter & Childs, 2017; Mugge, Jockin, & Bocken, 2017). More specifically, Paundra et al. (2017) explored the implications of car type on the intention to select an access-based option vs. a private car. The presence of an electric car in the shared offering influenced the intention to participate positively.

The product-need fit was also explored in connection to product type and longevity. It is understood as the ability of a product to meet the consumer specific need (Akbar et al., 2016). The authors found that product-need fit does not have a direct influence on intention, but it is mediated through materialism, specifically, possessiveness. Possessive individuals will participate in a sharing offering if there is a low product-need fit, i.e., if the product that is part of the sharing offering is not perceived as especially unique to meet their need, otherwise the consumer will prefer to own it. Additional aspects influencing consumers include the technology used to develop the offering (Borrello,

Caracciolo, Lombardi, Pascucci, & Cembalo, 2017; Netter, 2017), the design of the offering (Armstrong et al., 2015; Gullstrand Edbring et al., 2016; Jiménez-Parra et al., 2014) and the brand (Abbey, Meloy, Guide, & Atalay, 2015; Agrawal, Atasu, & van Ittersum, 2015; Borin, Lindsey-Mullikin, & Krishnan, 2013).

2.2.3. Knowledge and understanding

This theme includes aspects such as understanding the offering, adequate knowledge about the product, and information about the services. Understanding the offering refers to the ability of the consumer to assess what is needed from them in order to access the solution (Gullstrand Edbring et al., 2016). Public awareness has also been considered as an essential indicator of understanding and has been researched as an antecedent for acceptance (Guo et al., 2016). Schrader (1999) used the term observability to refer to this aspect. If an offering is not transparent, attitudes and intentions may not be as positive as expected.

Product knowledge refers to the information the consumer has to assess the quality of the product and the potential benefits it would yield (Wang & Hazen, 2016). It includes knowledge about the quality of the product, the environmental benefits, and the costs. A lack of knowledge can lead to erroneous perceptions regarding the quality of remanufactured products or the hygiene of sharing schemes (Baxter, Aurisicchio, & Childs, 2017). Information about the service is equivalent to understanding the product but refers to aspects such as terms of services, privacy policy and similar legal documents that govern the customer-service provider relationship.

2.2.4. Experience and social aspects

This category includes aspects related to how consumers experience the solutions, as well as how past experiences influence intention (Decrop, Del Chiappa, Mallargé, & Zidda, 2018; Johnson et al., 2016). Additionally, it also concerns privacy issues (Lutz, Hoffmann, Bucher, & Fieseler, 2017). The user experience includes affective elements such as the level of enjoyment people receive from participating in the offering that enable attachment development towards the objects (Armstrong et al., 2015; Barnes & Mattsson, 2017; Baxter & Childs, 2017; Catulli et al., 2016; Tussyadiah, 2016) and the impact such solutions have on the consumer's everyday life which in turn depends on aspects such as convenience and ease of use (Abbey, Meloy, Blackburn, Guide Jr., & Guide, 2015; Armstrong et al., 2015; Cherubini, Iasevoli, & Michelini,

2015; Paundra et al., 2017; Rexfelt & Hiort af Ornäs, 2009; Sabbaghi, Behdad, & Zhuang, 2016; Schaefers, 2013). Convenience is the ability of an offering to fit someone's daily routines and practices, while ease of use reflects the complexity of the offering. Finally, interactions also help explain why people would engage with circular offerings as social contact is highly appreciated among respondents in different studies (Armstrong et al., 2016; Hofmann et al., 2017; Piscicelli et al., 2015, W. Baxter et al., 2017; Guttentag et al., 2018). In addition to these, some authors also found that users are concerned about privacy issues (Lutz et al., 2017) which in turn is part of trust and perceptions of power (Hofmann et al., 2017). These aspects are presented in the following paragraphs.

2.2.5. Risks and uncertainty

This category includes aspects such as trust, disgust, and newness, as well as concerns about lack of ownership. Trust refers to the ability to be confident that the provider is offering a quality solution and that in case of damage they will solve any problem (Barnes & Mattsson, 2017; Catulli, 2012; Catulli et al., 2016; Möhlmann, 2015; Wang et al., 2016). It also refers to trust in other customers, as some of the solutions require interaction between customers (Etzioni, 2017; Hofmann et al., 2017; Lutz et al., 2017). In their study, Hofmann et al. (2017) explored how power and trust were perceived in collaborative consumption settings and how they influenced consumers' decisions. Trust is conceptualized regarding the provider and other users. Trust in the provider is stronger in collaborative settings where a company works as the provider compared to peer-to-peer and self-regulating communities. Trust in other users is stronger in peer-to-peer and self-regulating communities. Both types of trust are said to influence participation in sharing offerings, as they can reduce undesirable consumer behavior. Power, as exerted by the provider, is also perceived to prevent such forms of behavior and improve the consumption experience.

Disgust and newness are two aspects frequently mentioned in the literature as hindering acceptance. Disgust was considered by Abbey et al. (2015a) as the reaction to perceived product contamination and possible contagion. Such contamination was further explored by Baxter et al. (2017), who defined it as contaminated interaction, in contrast to technical and systemic contamination. Products become dirty by the fact that other people used it before, even if they have been cleaned and transformed. Contamination can be related to hygiene, territory or utility. Hygiene refers to health issues, territory to personal space and utility, to functionality or aesthetics. These three aspects influence how people perceive circulated products and how they behave towards them.

Such interactions relate to the concept of newness or lack thereof that is usually associated with circulated solutions (Gullstrand Edbring et al., 2016; Lawson et al., 2016). Newness is presented in the literature as a synonym for novelty and refers to prior ownership. Consumers are concerned with newness in connection to their perceptions of contamination and contagion described above. New products are perceived to be clean. Hence the chance of contagion is minimal. Despite the relevance of this aspect in consumer acceptance, no specific articles exploring it were found in the sample.

2.2.6. Benefits

Another aspect that influences the perception of circular solutions is the different types of benefits the consumer derives from the offering. On the one hand, economic benefits such as cost savings resulting from discounted prices have a positive effect on consumer acceptance according to the literature reviewed (Barnes & Mattsson, 2017; Lawson et al., 2016; Tussyadiah, 2016). On the other hand, several authors found that environmental benefits support positive perceptions (Catulli, 2012; Hazen et al., 2016; Van Weelden et al., 2016), and social benefits have been mentioned by authors as aspects relevant to the consumer (Lutz et al., 2017; Tussyadiah, 2016; Shuai Yang et al., 2017).

2.2.7. Psychological factors

As mentioned before, most of the studies conducted in this area focused on psychological factors such as attitudes, subjective norms, perceived behavioral control, habits, and values (Jiménez-Parra et al., 2014; Johnson et al., 2016; Khor & Hazen, 2017). These factors come from the proposed Theory of Planned Behavior by (Ajzen, 1991) which is used as the theoretical underpinning for a large portion of the literature reviewed. According to the author, "the attitude toward the behavior […] refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question. The second predictor is a social factor termed subjective norm; it refers to the perceived social pressure to perform or not to perform the behavior. The third antecedent of intention is the degree of perceived behavioral control which […] refers to the perceived ease or difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles." (p. 188).

2.3. The consumption perspective in the design of circular offerings

Design, as an area of research, considers the user as a crucial element in the creation process. Despite the wealth of knowledge from the field of Design for Sustainability and related areas such as Design for Sustainable Behavior, eco-design, sustainable design and practice-oriented design, only a handful of articles explicitly addressing the circular economy and circular offerings such as remanufacturing, PSS and collaborative consumption, were found. This result might have emerged due to the choice of keywords as they might not reflect the language used in the design field.

Dewberry et al. (2013) investigated how a development company implemented a design process that aimed at integrating PSS in a housing solution. They focused their attention on the role that end-users play in such a process, and on the consequences of such involvement. The process included the stages "Understanding the context", "Developing concept PSS" and "PSS evaluation". End-users were involved in the initial and final stages of the process. Among their findings, the authors indicated that initial ambitions to the desired PSS solution were diluted following practical and commercial concerns from the developers. The authors speculate that this could have been avoided if end-users were involved in the PSS development stage as they could have challenged the client's assumptions. They conclude that effective PSS design requires a "much deeper and thoughtful approach to local contexts and needs is required, and opportunities for participatory design should be explored." (p. 425).

A similar suggestion was made earlier by Knot & Luiten (Knot & Luiten, 2006) when they analyzed the process of creating a mobility-related PSS. They found that user involvement in the design process was complicated as intangible elements of a PSS were challenging to communicate to participants. Moreover, they suggest that in the context of PSS, prototyping and testing were crucial steps to develop further user insights. User research activities not only helped gather information, but they also contributed to lower skepticism towards the innovation. Ambassador users were identified as a tool for engaging potential users, known in the literature as lead users. Finally, understanding who the potential users are, their behaviors before the introduction of the innovation, and in general, the specific context in which the offering will be deployed can help identify potential undesired outcomes.

A crucial aspect highlighted by Stacey & Tether (Stacey & Tether, 2015) was the consideration and integration of emotions and a sense of familiarity in

successfully developing a circular solution in the health sector that users engage with and accept. An aspect highlighted by Knot & Luiten (2006) that relates to these elements is the need to consider daily practices in the design process. Daily practices make up everyday lives, i.e., routines people perform in their day-to-day contexts that can affect how they react to new solutions. Other authors highlighted cost savings, income and elements of efficiency as also being relevant for the consumer and user (Dewberry et al., 2013; Gargiulo et al., 2015) and as essential to incorporate into the design process. Other aspects mentioned in the literature as increasing consumers' positive attitude towards circular solutions include control, knowledge and creativity (Gruen, 2017) which need to be acknowledged during the design process.

2.4. Research challenges in the reviewed literature

The systematic review provided an overview of the different topics addressed by the scientific literature regarding issues of consumption in the context of the circular economy and circular offerings. This literature study has shown there is a wealth of knowledge and understanding about the relationship between consumption, the circular economy, and circular offerings that are expanding. Most of this research has addressed the question about what drives consumers to engage in circular offerings and has provided a set of factors that influence consumers' decision to engage in such types of offerings. Besides factors driving or preventing engagement, some authors have explored the topic at a broader level, inquiring about how consumption in the circular economy and of circular offerings are different from linear forms. Finally, the third area of research identified in the literature refers to design processes and the role of the user.

One of the limitations of this body of research is that *a significant number of studies have focused on the intention of people to participate in such offerings rather than the behavior*. However, and as research from the field of consumption has pointed out, intention often fails to reflect behavior (Michaud & Llerena, 2011; Welch & Warde, 2014). Moreover, most studies based their empirical work on scenarios and fictional value propositions, limiting its explanatory potential (Qu, Yu, Chen, Chu, & Tian, 2016). *An adequate approach to overcome this limitation would be to explore why people that have already engaged with circular offerings have done so. Similarly, it is more accurate to use existing offerings than just prototypes when exploring barriers.*

Most research has been conducted in developed economies, and only a few studies explore such questions in emerging economies. Diversifying the

geographical focus of research is relevant because, even though consumption levels are the highest in industrialized countries, consumption in emerging economies is growing at a higher rate making the transition to the circular economy equally urgent. It was also noticed that most research has focused on mobility and accommodation services, which represent essential sectors with significant potential for circulation. However, other sectors and product types for which circular offerings may offer more challenges should also be explored, for example, the clothing industry and food.

Existing work, as described above, focuses on how consumption is perceived differently in the context of the circular economy and circular offerings. It elaborates on what are the general aspects that characterize circular consumption and provides insights on how to move from a linear to circular forms of consumption. The reviewed literature offered little input on what actions do consumers need to perform to participate in such offerings successfully. Finally, and in connection with such a gap, more work exploring the user perspectives in design tools for the circular economy is needed. Researchers from the field of Design for Sustainability have already tackled some of the gaps mentioned above, even though they have not explicitly called it circular economy or circular offerings.

Although this review aimed at being systematic, it has several shortcomings. On the one hand, it used a limited definition of circular solutions, restricting the web search to three types of offerings that are based on the circulation of materials. Reviews on the circular economy (Lewandowski, 2016) include other solutions aiming at improving energy efficiency and recovering energy. These solutions were not included in this research as they have been thoroughly addressed in previous work (e.g., Selvefors, 2017). The review focused on presenting the acceptance factors but not on the relationships between the factors, such as hierarchies.

Moreover, although the review tried to be exhaustive when selecting the papers, several were unintentionally left out due to a lack of awareness. Finally, the review did not include conference papers to maintain a high level of rigor. However, and given the novelty of the issue of the circular economy as a scientific topic, they can provide valuable insights regarding what areas of interest are emerging.

3. Theoretical perspectives

This section is an edited version of the theoretical background presented in the different papers included in the thesis.

This chapter presents the theoretical underpinnings for answering the research questions guiding this doctoral project. The first sub-section elaborates on the definitions of consumption, circular economy, and circular offerings used in the research. The second sub-section describes two of the most prominent perspectives in understanding changes in consumption from the field of sustainable consumption. The last sub-section describes existing approaches to design in the context of the circular economy.

3.1. Consumption, circular economy, and circular offerings

3.1.1. Consumption

Consumption has occupied researchers from fields such as economics, psychology, cultural studies, and sociology (Halkier et al., 2017; Reisch and Thogersen, 2015). Economic approaches view consumption as the action of purchasing and using goods and services to satisfy needs (Black, Hashimzade, & Myles, 2009). Social psychology investigates consumption as a purchase focusing on variables such as attitudes and values (Reisch & Thogersen, 2015). Researchers in fields such as anthropology and marketing has focused on emotional, affective and cultural factors and their role in consumption processes. As such, consumption is considered as a means to position oneself in society, build an identity and satisfy desires (Jackson, 2005). More recent accounts of consumption have brought light to less conspicuous activities, such as water and energy consumption in the context of everyday life (Shove & Pantzar, 2005) and to ordinary consumption, such as food consumption (Mylan et al., 2016), detergents and lightning (Mylan, 2015). Within this latter approach, consumption is the result of the intersection of different practices happening in everyday life and comprises not only the acquisition or purchase of goods and services but also its use and discarding (Evans, 2018).

Within this understanding, consumption is defined as a collection of moments that both reinforces and breaks the relationship between the consumer and the object of consumption. Warde (2005) suggests three moments of consumption, acquisition, appropriation, and appreciation. Objects enter the domestic sphere when they are acquired. The most common way of acquisition in the linear economy is through purchasing. Appropriation involves the actions by which people integrate and use acquired objects or experiences in their every day. Gruen (2017) suggests that

appropriation has the goal of transforming the use or functional value of an artifact into sign value, creating a meaningful relationship with the object. She suggests this is achieved through creation, knowing and controlling practices. For services, Mifsud et al. (2015) indicated that appropriation is the result of five aspects, knowledge, self-adaptation, control, creation, and psychological ownership.

After objects and services become part of people's everyday life, they remain there because they offer satisfaction or pleasure to consumers, resulting in their appreciation. Appreciation results in the creation of an emotional bond with the product. It has also been defined as product attachment (Mugge, 2007). According to Mugge (2007), four factors influence such process, self-expression, group affiliation, memories, and pleasure. However, artifacts do not stay forever with consumers, as recent figures about waste generation illustrate. This situation requires an expanded understanding of consumption that integrates the processes by which objects enter and stay within the domestic realm with those that result in such items exiting the consumer/user space.

Evans (2018) suggested three additional moments of consumption that can explain such exiting process: devaluation, divestment, and disposal. Devaluation refers to the moment of consumption when objects and experiences stop bringing pleasure, joy or satisfaction, losing its value. When a phone stops functioning correctly, as it becomes slow, or when it suffers aesthetical damage, i.e., a broken screen, it loses its value. Once objects become devalued, the emotional bond a person had developed with a particular 'product specimen' breaks (Mugge, 2007). Thus, the phone is used less, and alternative options start to be explored, and the restaurant is visited less frequently. Evans refers to this moment as divestment. Finally, the moment when consumers discard the products, services, or experiences, they no longer want is referred to as disposal.

Table 6 Moments of consumption

Moment of consumption	What people do	Description
Acquisition	How do people access an object?	Co-using, borrowing, renting, subscribing, and leasing (Selvefors, Rexfelt, Renström, & Strömberg, 2019)
Appropriation	How do people domesticate an object?	Creation, knowing and controlling practices (Gruen, 2017); Service knowledge, self-adaptation, service control, service creation, and psychological ownership (Mifsud, Cases, & N'Goala, 2015)
Appreciation	How do people derive satisfaction from an object?	Self-expression, group affiliation, memories, and pleasure (Mugge, 2007); Enjoyment, individual

		autonomy, group affiliation and life vision (Schifferstein & Zwartkruis-Pelgrim, 2008)
Devaluation	Why do people stop getting pleasure and satisfaction form an object?	As suggested by Evans, and in opposition, at this moment the product or service, stops affording identity, enabling group affiliation, creating memories, and being pleasurable
Divestment	How do people grow detached from an object?	Similarly, we can suggest that PSS users divest from it when they stop understanding the service, participating in it, and when they lose control of it.
Disposal	How do people get rid of an object?	Users can finish co-using agreements, return products, end contracts, offer access, give items up, trade items back, sell items and bring items back (Selvefors et al., 2019)

3.1.2. Circular economy

The circular economy as the opposite of a linear economy has been recently defined as "an industrial economy that is restorative by intention; aims to rely on renewable energy; minimizes, tracks, and eliminates the use of toxic chemicals; and eradicates waste through careful design. The term goes beyond the mechanics of production and consumption of goods and services in the areas that it seeks to redefine (examples include rebuilding capital, including social and natural, and the shift from consumer to the user). The concept of the circular economy is grounded in the study of non-linear systems, particularly living ones" (Ellen MacArthur Foundation, 2013, p. 22). This definition was later translated into three principles, designing out waste, keep materials and products in use and regenerate natural systems (Ellen MacArthur Foundation, 2015) that have been adopted but a variety of stakeholders and are present in regional, national and local policies as well as companies' documents and reports.

Figure 4 presents a graphical representation of the circular economy based on the report by the Ellen MacArthur Foundation (2013). In this figure, there are two cycles, the biological on the left and the technical on the right. It also includes several actors that need to be part of the circular economy, the user or consumer, at the center. Upstream is the retailer, followed by the product manufacturer, the materials manufacturer. Downstream is the incinerator and the landfill operator. This project focuses on the technical side, which refers to the circulation of products that do not biodegrade in the foreseeable future.

The technical side of the butterfly diagram includes three main activities reuse, remanufacture, and recycle. The original proposal included maintaining/repair as a

strategy. However, in this project, we consider it as part of the reuse set. If a circular economy is not in place, products leave the consumer and user to move on to incineration and landfill. Ghisellini et al. (2016) and, more recently, Kirchherr et al. (2017b), indicate that the circular economy also includes activities that reduce the consumption of products and materials. However, this approach can be interpreted as encouraging extended use or reuse of already acquired products, thus resulting in less consumption. Hence, consumption reduction activities are included here in the category reuse.
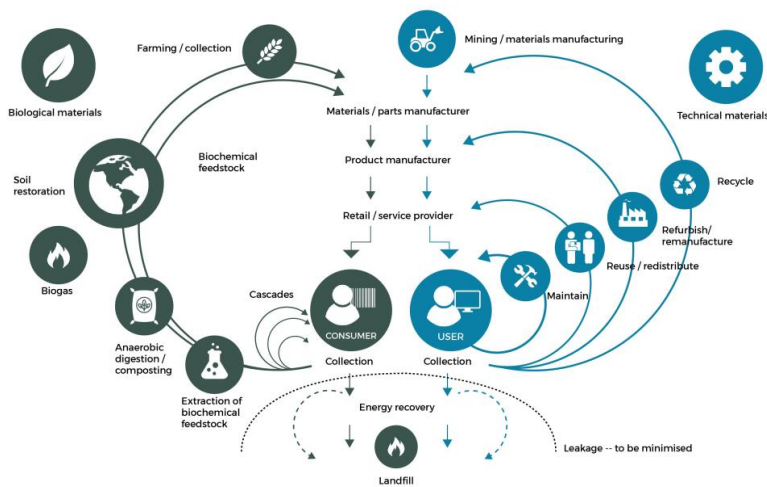
Figure 4 A simplified circular economy.

Source: https://i.pinimg.com/originals/34/27/09/34270977f229dfd35fd15f00689b4c96.jpg

The current concept of the circular economy is the result of the accumulation of different ideas and notions that started to develop in the late 1990s (Ghisellini et al., 2016). In their review, they trace the initial mentions of the circular economy to texts from the field of environmental economics and industrial ecology. Both areas had discussed the need for closing resource loops to mitigate the environmental impacts of industrial systems. Frosch (1992), for example, introduced the idea of industrial metabolism that later supported initiatives such as industrial symbiosis. Other contributions to the modern notion of the circular economy come from the guidelines provided by McDonough and Braungart (2002) to developed products in their Cradle to Cradle approach. Research from the field of sustainable consumption has also

explored concepts that today are a synonym to the circular economy, such as Product-Service Systems (Halme et al., 2004; Heiskanen & Jalas, 2003; Meijkamp, 1998; Mont, 2000). Thus, it may be safe to suggest that the circular economy is not a new idea. Instead, it can be argued that it is the rebranding of many initiatives that have been developed in different fields that had failed to attract enough attention in the past.

Despite the interest in the circular economy and its potential to improve resource efficiency, some questions about its effectiveness have been posed. First, Zink and Geyer (2017) questioned the ability of circular economy strategies to reach environmental benefits. They indicate that environmental benefits will only happen if secondary product consumption replaces primary product consumption. This, in turn, depends on market forces that single companies cannot control. Thus, implementing circular strategies does not necessarily translate into environmental benefits unless this condition is met. They further argue that the circular economy can also fail to deliver environmental benefits if a rebound effect occurs, as with energy efficiency. A circular economy rebound "occurs when increases in production or consumption efficiency are offset by increased levels of production and consumption" (p. 596).

Hobson and Lynch (2016) argue "that the CE's current framing as a pathway to large scale transformative change is far from radical as it fails to address the roots and origins of the issues it claims to remedy." (p. 17). The authors claim that the current understanding of the circular economy, advocated by actors such as the EU and the Ellen Macarthur Foundation is one of the most recent examples of "ecological modernization." This approach argues that it is possible to achieve sustainability only and mostly, by widely adopting circular technologies and infrastructures. By doing so, continue the authors, such perspective minimizes the role of social norms and perpetuates consumption-based societies.

Welch et al. (2017) suggest that current understandings of the circular economy but the EU, for example, aim at combining conflicting consumption concepts. On the one hand, they seem to promote efforts towards the "intensification of commercialization" by monetizing private assets through platforms such as Uber or Airbnb. On the other hand, they want to support "trends of de-commercialization" that include swapping and sharing events. As a result, the authors argue that such approaches to the circular economy minimize the moral justifications by locating them under the same model.

A common element in these perspectives about current definitions of the circular economy is consumption. Zink and Geyer suggest that the environmental potential of the circular economy depends on people changing their consumption patterns from

acquiring primary products to secondary products. Hobson and Lynch move a step forward and suggest that such change does not only depend on circular technologies adoption but in the transformation of consumption practices and social norms. Finally, Welch et al. call for advocates of the circular economy to question the forms of consumption that would be part of such a model.

3.1.3. Circular strategies and offerings

Rizos, Tuokko, & Behrens (2017) identify three types of processes that contribute to circularity and resource efficiency, and that can be used to classify different types of offerings that deliver value to the market segments companies serve. The first category groups offerings that use fewer primary resources, for example, solutions based on recycling, efficient use of resources, and utilization of renewable energy sources. The second group includes solutions that maintain the highest value of materials and products, such as remanufactured and refurbished products, re-used products and components, and services for product life-extension. Finally, solutions that change utilization patterns, such as product as a service, sharing platforms, and shifts in consumption patterns.

For Bocken et al. (2016), a circular offering solves a problem at the same time it contributes to the closing, slowing or narrowing of material flows. They suggested different business strategies that contribute to each of these aims, the access performance model, extending product value, classic long life, encouraging sufficiency, extending resource value, and industrial symbiosis. Figure 5 illustrates the different aims, the business strategies and the offerings defined by Bocken et al.

Circular Objectives	Business Strategies	Offerings
Closing material loops	Extending resource value	Recycling products
Slowing material loops	Access-based Extending product life Classic long-life model Sufficency	Sharing platforms Use and Results PSS Remanufactured products Collaborative Consumption Product PSS Premium products
Narrowing material loops	Extending resource value	Recycling products

Figure 5 Circular objectives, business strategies, and offerings

Product Service Systems

A product-service system is "a system of products, services, supporting networks and infrastructure that is designed to be: competitive, satisfy customer needs, and have a lower environmental impact than traditional business models." (Mont, 2002, p. 239). Tukker (2004) classification of PSS into three categories is widely accepted and used both in the scientific literature and practice. PSS can be product-oriented, results-oriented, and outcome-oriented. From a sustainability perspective, the last category would perform best since the company has the incentive to reduce costs, including materials, thus creating the opportunity for increased efficiency and improving sustainability. In contrast to that, the two first groups still depend on the physical product to deliver value; therefore, the potential for material efficiency might not be as considerable. Companies have implemented PSSs as a strategy to

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commercialize remanufactured products and intensify the use of goods, thus making it a strategy for reuse, a key activity within the circular economy.

In a use-oriented PSS, "the product stays in ownership with the provider, and is made available in a different form, and sometimes shared by many users. Since the time the article was published, this type of business model has been adopted in several sectors" (Tukker, 2004, p. 248). For example, in the mobility sector, car-sharing schemes owned by car companies have inundated the main cities of Europe and North America (Bardhi and Eckhardt, 2012). This model has also been applied to other forms of personal mobility such as bicycles, mopeds, and, more recently, scooters. The implementation of sharing services has been enabled by the ubiquity of the internet, geolocation, and digital devices such as smartphones (Accenture, 2014). With the advancement of sensors and the Internet of Things technology, new products are joining this trend, for example, white goods, and more recently, clothes.

Sustainability scholars have advocated that use-oriented PSSs can contribute to the reduction of material used by a unit of value (Heiskanen and Jalas, 2003; Mont, 2008, 2002). However, experts from the field of sustainability assessment have questioned this statement (Mont and Tukker, 2006; Tukker, 2015; Tukker and Tischner, 2006). According to their arguments, low adoption levels hinder the environmental potential of PSS in general and use-oriented PSS. Farrant et al. (2010) performed a Life Cycle Assessment of different businesses enabling clothes' reuse. They found that their environmental effect depends on the extent they replace the consumption of new clothes. This perspective is shared by Iran and Schrader (2017) in their analysis of the collaborative consumption of clothes when they suggest that an environmental benefit will only realize if consumption through this type of business model replaces linear consumption.

Collaborative consumption: swapping

Collaborative consumption, as defined by Ertz et al. (2016), considers activities that involve consumers as both providers and "obtainers" of resources. It can be based on access and ownership transfer, either online or offline. In practice, sharing economy solutions and collaborative consumption solutions aim at facilitating access to underused assets via marketplaces, platforms, or networks. They are not restricted to community initiatives; some companies have developed solutions based on such premises. Technological developments have facilitated the proliferation of the sharing economy and collaborative consumption-based solutions, as they have allowed organizations and peers to access broader markets and populations (Accenture, 2014).

Within collaborative consumption, we chose swapping as an example of a circular offering. Only a few publications exist that have explored clothes swapping when addressing motivations and drivers for participation. In an early work, Albinsson and Perera (2009) explored swapping as an example of consumer voluntary disposition behavior and offered insights into the motives for different types of disposition. Later on, they focused on the experience of swappers, the drivers, and barriers for participation (Albinsson & Perera, 2012). Armstrong et al. (2015) explored positive and negative consumer perceptions regarding different sustainable solutions, among which was swapping. They continued such exploration by comparing results between two countries, Finland and the United States, in the specific case of digital solutions (Armstrong et al., 2016). Additionally, Matthews & Hodges (2016) investigated what benefits did participants get from engaging in such events. These studies used clothes swapping as their object of inquiry, while authors such as Ertz et al. (2017) investigated the swapping of mobile phones and the motivations to engage in such a form of disposal.

3.2. Moving towards a circular consumption

Answering the question of why consumption patterns change has been approached from different perspectives. Individualistic approaches suggest that individual choices and behaviors drive change in consumption patterns. Structural perspectives argue that it is social structures that define how people consume. A third approach focuses on the interaction between these two levels in the form of social practices (Halkier, Keller, Truninger, & Wilska, 2017; Jackson, 2005). For the first perspective, economic, psychosocial and cultural theories use the individual as a departing point and see societal change as being driven by the sum of individual decisions. These approaches focus on why people are willing to change their consumption patterns by examining willingness to pay in the case of economic theories, the intention to perform a given behavior, in the case of psychosocial theories, and regarding cultural theories, looking into the attitudes, values and identity projects. The social practice perspective does not use the individual as a departing point, but the social practice understood as a collective phenomenon that creates a social life. By acknowledging the context and conditions that are not specific to the individual but influence their actions, this approach provides elements for understanding adoption, i.e., the actual engagement in circular offerings. The following subsections discuss the answers provided by the different theories to the question of why people accept and adopt alternative forms of consumption as they provide the theoretical framework for studies 2, 4 and 5.

3.2.1 The individual lens: building acceptance

As mentioned, an individual approach to understanding consumption provides answers mostly to the question of why people have or not the intention to behave in a certain way, e.g., to engage with specific offerings (Halkier et al., 2017; Reisch & Thogersen, 2015). The answer to this question refers to the factors and aspects that influence intention. Thus, if a behavior is to become desirable, interventions should tackle the elements explaining intention. Economic theories conceptualize individual behavior as a rational decision-making process that balances costs and benefits (Jackson, 2005). Thus, the most relevant factors from an economic perspective include the costs of using the offering which include recurrent fees for using the product in the case of PSS offerings, potential problems with malfunctioning objects, and cleaning costs for second-hand products (Barnes & Mattsson, 2017; Lawson et al., 2016; Tussyadiah & Pesonen, 2016).

Additionally, consumers also consider the potential benefits be these, savings for a reduced price, positive experience with the offering, social benefits derived from increased interaction, or contributing to improving the environment by reusing products (Guttentag, Smith, Potwarka, & Havitz, 2018; Lawson et al., 2016; Sujin Yang & Ahn, 2016). The characteristics of the offering have also been considered, particularly quality in terms of functioning and aesthetics (Armstrong et al., 2015; Hazen, Boone, Wang, & Khor, 2017). Consumer's income is also a factor that is considered in the cost-benefit analysis, relevant information about the offering, the price, and potential risks, which are connected to the quality of the offering and the information provided (Borrello et al., 2017; Paundra et al., 2017).

Additional factors related to the consumer explored in the literature about circular offerings that influence individual choice include materialism, control, status, desire for uniqueness, and sharing disposition. Materialistic individuals may have trouble engaging with access-based solutions (Davidson et al., 2017; Lawson et al., 2016). The role of status has also been explored by authors such as Catulli et al. (2017, 2016), Lawson et al. (2016), and Wilhelms et al. (2017). Other aspects include the need for uniqueness (Lang & Armstrong, 2018), desire for change (Armstrong et al., 2015), and sense of community (Catulli et al., 2016). Ozanne & Ballantine (2010) investigated materialism and found that parents holding anti-materialistic values used toy libraries.

Nevertheless, this approach, suggesting consumption is the result of a very organized and deliberate decision-making process by individuals, misses an important point that has been raised by researchers coming from the sociology of consumption and sustainable consumption. On the one hand, these approaches deal

primarily with consumption decisions that are deliberate and conscious. However, in the context of everyday lives, consumption is, to a significant extent, habitual and routinized (Sanne, 2002). Moreover, consumption is constrained by specific norms that limit and direct the available choices, including economic institutions such as work and markets (Schor, 2005, 2008). Such limitations are behind the rather gap between intention and behavior, as described by Welch & Warde (2014). Thus, although these theories can help understand why people may have a positive attitude toward novel offerings, they are not enough to explain why the change could happen.

3.2.2. The social practices' lens

Practices as a unit of analysis help overcome the individual approach limitations by bridging the individual, the interactions between individuals and, the objects (Røpke, 2009). As presented by Giddens (1984) cited in Shove et al. (2012b), in a social practice, the individual and the object are part of duality and not parts of a dualism, overcoming the need to focus on either. By enabling the exploration of such diversity of elements, a practice-oriented approach helps improve the understanding of how specific forms of consumption emerge, evolve, and disappear. Following Schatzki (2001), "practices are embodied, materially mediated arrays of human activity centrally organized around shared practical understanding which depends on shared skills or understandings" (p. 11). First, practices could be considered as a network of doings and sayings by many different people, grouped into three components, understandings, procedures and engagements which is known as practice-as-entity. In a second sense, practices can be understood as the execution of such practices, which in turn results in its reproduction, referred to as practice-as-performance. Such a performance of a practice sustains and changes the linkages between the elements of the practice as an entity allowing the practice to endure. (Warde, 2014) suggest that there are two types of practices, autotelic and heterotelic. Autotelic practices are an end in themselves, e.g., skateboarding or driving. Heterotelic practices are a means to another end, such as planning or listening to music. These types of practices are not mutually exclusive.

Social practice as an entity

Shove, and Pantzar (2005, pp. 44–45) built on Schatzki's definition and suggested that practices as entities "presume the existence of requisite elements, including images, forms of competence and in many cases objects as well." Shove et al. (2012b) defined materials as the physical entities that are used when performing a practice such as clothes in dressing, a car in driving or the computer when working.

Materials include the "objects, infrastructures, tools, hardware and the body itself" (p. 23). Competencies and skills refer to the knowledge required to operate the materials, perform the practice and evaluate the outcome. In the case of dressing, competence could refer to the knowledge about the size that fits oneself, the instructions for taking care of the garment as well as the appropriate dress codes in specific social settings. Finally, meanings indicate the images the practice evokes for people, i.e., "the social and symbolic significance" people give the practice. In dressing, specific types of garments could be associated with power positions or social occasions. In addition to these elements, Gram-Hanssen (2010) suggested that rules and institutions are also part of social practices.

Social practice as performance

Practices are not stable entities; As a performance, practices are enacted by people, or "carriers" who interpret and integrate the above-mentioned elements in different ways (Pettersen, 2016; Warde, 2005; Warde et al., 2017). Thus, the practice is reconfigured over time to incorporate the different inputs provided by different carriers, and to expel the ones that are not performed. Such dynamics are also reflected in the different stages a practice goes through the initial configuration, stabilization, and breaks. In her analysis of lighting, Mylan (2015) explores how the different elements of the practice influence and are influenced by each other, describing a trajectory for the practice. From being only about bringing brightness, lighting is now also about experiences, ambiances and safety. As a result, new competencies for creating such experiences are required from practitioners. A similar analysis was applied to laundering. Changes in ideas about cleanliness have influenced how clothes are cleaned, what materials are required, as well as competences. Thus, when understanding the change of practices, not only the elements are essential but also how they affect each other, opening new options for intervention.

Such reconfiguration also depends on how many people engage in the practice. This level of participation also contributes to the normalization of the practice (Huber, 2017). The more people perform a practice, the more normal it becomes. According to Huber (2017, p. 59) recruitment or defection depend on the level of embodiment of the practice, which in turn depends on three elements: "1) the frequency of exposure to a practice (2); the match with available capitals and embodied practice 'histories'; and (3) the fit into existing arrangements of practices, ordered in time and space". Thus, to understand what sustains a practice, it is crucial not just to describe the different elements that make up the practices and the linkages between said elements. It is also necessary to investigate how such elements have integrated over

time, how the practice has recruited people, or how the practice has expelled practitioners.

Because practitioners, individuals perform practices, they entail interaction between people (Røpke, 2009). As both individuality and social order emerge from practices, practice theories can help understand power dynamics, primarily if power "is understood at the most basic level as acting with effect" (Watson, 2016, p. 2). Not many studies have explored this aspect in the context of collaborative consumption and the sharing economy. Fitzmaurice & Schor (2018) and Schor et al. (2016) explored examples of the sharing economy from the perspective of distinction, using a Bourdieusian approach. They questioned these practices regarding power dynamics and found that although they are presented as democratic and horizontal initiatives that challenge traditional forms of consumption, it is possible to see how different allocations of capital, primarily cultural, result in unequal relations.

Recruitment and reproduction of social practices

Depending on how many people perform them, practices appear and disappear. The number of people "carrying" a practice depends on the capacity of the practice to recruit participants (Huber, 2017; Shove et al., 2012a). The more people perform a practice, the more normalized it becomes. According to Shove et al. (2012a, p. 2), "the chances of becoming the carrier of anyone practice are closely related to the social and symbolic significance of participation and to highly structured and vastly different opportunities to accumulate and amass the different types of capital required for, and typically generated by participation." Besides, Shove et al. indicate that "[a]ccidents of birth, history and location are all important, as are social networks" (p. 3). Practices also need to be rewarding, convey meaning and fit with other social practices. Finally, the rate of penetration of a given practice or the level of exposure to a given practice contributes to recruitment or defection.

Beyond recruitment, for a practice to survive, practitioners need to reproduce it; they need to "build a career" within the practice, which happens through processes of learning and sharing (Shove et al., 2012a). By performing the practices, practitioners 'advance' in their careers and change roles, from outsiders to novices, to experts or "full practitioners," which also reveals high levels of commitment to the practice. Exchanges between different types of carriers, allow the practice to abide. Practices disappear because they fail to recruit and retain practitioners or because they need to make space for radical innovations that replace them like cycling and the car. Moral and ideological changes that require new practices to emerge as the old ones become inadmissible also drive practices to extinction. Finally, a temporal dimension

is also relevant as some practices are relevant during specific moments in life, while others will always be present.

In sum, a practice has better chances to recruit practitioners depending on the opportunities for embodiment available. These opportunities depend on the exposure, personal capitals and histories, their links to other practices, and the meaning and significance the practice has for practitioners. Social practices also need to offer opportunities for practitioners to build a career through learning and sharing, which happen through networks.

3.3. *Design for the circular economy*

Design is considered as a primary tool to innovate in different contexts, e.g., business, governments and local communities (Ceschin & Gaziulusoy, 2016). It is a way to operationalize theoretical insights regarding societal challenges, one of which is sustainability. Thus, it is a crucial tool to develop interventions that trigger changes in consumption towards circularity. Nevertheless, design for circularity is not a novel approach defined by recent advocates of the circular economy. It has its roots in the early works of eco-designers attempting to reduce the environmental impacts of products (Dewulf & Duflou, 2004). Furthermore, it has resulted in tools and approaches that have informed product and business development for almost two decades (McDonough & Braungart, 2002).

Recently and in the European context, Bakker et al. (2014), Bocken et al. (2016), Moreno et al. (2016), Sumter et al. (2018), have offered different frameworks to understand the different options designers have to enable circularity. Bakker et al. offer five different strategies: material efficiency, longer product life, reparability, refurbishment/remanufacturing and recycling. Bocken et al. (2016) build on this contribution and expands to suggest design for long-life products, design for the product-life extension as strategies to slow the resource loops. For closing the resource loop, the authors suggest design for the technological cycle, design for the biological cycle and design for disassembly. Design for the technological cycle requires creating products that can be easily and safely recycled into new materials and products. Design for the biological cycle targets products that will be consumed, and as such need to be made with materials that can get back into biological cycles safely and efficiently. The final strategy, design for dis/re-assembly, aims at facilitating end-of-life treatment for products, materials and components in both cycles.

In parallel, Moreno et al. (2016) suggested five design strategies for the circular economy: a design for circular supplies, for resource conservation, for multiple

cycles, for long life use of products and for systems change. These different proposals share objectives such as extending product lives and enabling product/material/component reuse. Bocken et al. make the difference between cycles, explicit and Moreno et al. stress the importance of a systems perspective. Another characteristic is that most of these contributions guide from a production perspective with only Bocken et al., including sub-strategies that seem to address consumption concerns, such as design for attachment, design for reliability and durability, and design for ease of maintenance and repair. Lofthouse & Prendeville (2018) indicate a similar observation regarding the literature they reviewed.

Nevertheless, and even though the circular economy is enabled by products that can be circulated, it also requires that they are, in fact, circulated. This not only requires people to behave differently, but it also needs drastic changes in consumption practices (K. Hobson, Lynch, Lilley, & Smalley, 2017). Design as a discipline offers approaches and tools to enable such transformations, gathered under the Design for Sustainability field. Specifically, the areas of design for sustainable behavior (Boks, 2006, 2012; Boks & Daae, 2017; J. Z. Daae & Boks, 2014; Rodriguez & Boks, 2005) and practice-oriented design (Kuijer, Jong, & Eijk, 2013; Pettersen, Boks, & Tukker, 2013) have addressed these challenges.

3.3.1 The user perspective and design for the circular economy

Based on similar observations, and to fill the gap, some researchers are developing design frameworks that bring the user and consumption practices perspectives into the design process. In a recent paper, and using design for sustainable behavior, Daae et al. (2018) explored what dimensions of behavior change are being applied, intentionally or unintentionally, in the design or communication of product and services that contribute to a circular economy, and how they are being used. They applied the Dimensions of Behavioral Change tool developed by Daae & Boks (2014) to analyze cases applying four circularity strategies, maintenance, reuse, refurbish and recycle. They qualitatively assess the extent to which four companies used control, obtrusiveness, encouragement, meaning, direction, empathy, importance, timing and exposure in their communication and offering design. They found that direction, importance and control dimensions were used uniformly among cases, while obtrusiveness, timing, exposure and empathy were used in a variety of ways.

Wastling et al. (2018) explored the user behaviors required for the transition to a circular economy focusing on three different types of PSS based on Tukker (2004). They used their findings to develop a framework for designing products and services that encourage desired circular behaviors. As a first step, they identified a series of

desired behaviors for PSS in which the provider owns the product, and the user owns it. They analyzed the behaviors for two stages in the consumption process, use and end of use.

Using an innovative approach, Chamberlin & Boks (2018) investigated the suitability of design for sustainable behavior approaches and marketing strategies to analyze communication strategies implemented by companies offering circular value propositions. They found that design frameworks such as the Dimension for Behavioral Change (Daae & Boks, 2014) and Design with Intent (Lockton, 2010) can provide a more nuanced understanding of marketing efforts that aim at changing people's behavior.

More recently, Selvefors et al. (2019, 2018) explored what the user perspective on product circularity entailed for design and elaborated a framework to guide designers. In contrast with Wastling, the authors focus more on the definition of consumption and suggest how such understanding can reframe the production-oriented narrative of the circular economy. They suggest consumption is a three-parted process as opposed to one focused only on the purchase of products. Their consumption process is divided into obtainment, use, and riddance stages. Products can be accessed or owned. Access can be gained through co-using, borrowing, renting, subscribing, and leasing. Ownership can be obtained via receiving, trading and buying.

Similarly, users can finish co-using agreements, return products, end contracts, offer access, give them up, trade them back, sell them and bring them back. They suggest that what path the consumer selects, influences resources throughput. What path is chosen depends on how advantageous it is to the user, particularly considering the type of activities the given path entails.

These contributions bring attention to the consumer and user as an active participant in the economic system that can influence how materials and products circulate, a novel approach that is scarce in the existing literature. Although both make significant contributions to this innovative perspective, they also open space for further work. Their understanding of consumption is somehow still limited, as they see it as a two or three-step process. As it is argued in this article, consumption is more nuanced, and the resulting opportunities for intervention can be numerous. From an empirical perspective, and because their main objective was to create a design approach from a user perspective, neither of these studies had access to existing businesses and consumers involved in circular business models that could provide data to assess their suggestions.

3.3.2 Changing consumption practices towards circularity and the role of design

An alternative perspective to designing for behavior change focuses on social practices. Scott et al. (2012) suggested that practice-oriented design requires "understanding how technologies and artifacts become embedded and dislodged from ordinary practices [as it] might reveal points of leverage for change, and therefore innovation." (p. 283). According to Pettersen (2015) designing with a "practice orientation means highlighting the mutual dependency and effects within complexes of components, and opening up questions about what parts of practices artefacts carry knowledge about and potentials for, and how to discourage unsustainable global outcomes." (p. 81). Thus, practices as a unit of design can be used in the generative phases of design projects.

Kuijer et al. (2013) identified two new approaches to design using practices as a unit, experiments in practice and trigger products. The first approach challenged design students to come up with innovative and sustainable ways regarding bathing. Based on this experience, the authors suggested a process following six steps: deconstruct, deviate, design, integrate, deliberate and circulate. These stages encourage both reflection and real-life performance. By following such an approach, participants made norms explicit and became aware of how infrastructures constrain change. Despite its valuable insights, the authors acknowledge that such a method might be more suitable for academic settings rather than commercial design. The second approach, trigger products, aims at explor[ing] what types of uses would emerge and how these may fit in or conflict with existing practices, and trigger a variety of bodily responses and the evaluative reflections they evoke." (Kuijer et al., 2013, p. 8). Both approaches enabled design researchers to witness how design interventions perform in an everyday life context, how people perform it, the conflicts that emerge from introducing a novel element in an ordinary context. A practice-oriented approach to design thus requires "the inclusion of bodily performance, the creation of crises of routine and a variety of performances." (Kuijer et al., 2013, p. 19)

Specific applications of a practice-oriented design approach in the circular economy were not found. However, Pettersen (2016) argues that such a perspective could support reductions in resource use by enabling in-depth understandings of the practices behind resource-intensive use. By using a practice perspective of television entertainment practices, the author provides a set of aspects to be considered when exploring change opportunities. By analyzing the environmental impacts, the service concept, the practice components and performance, the position of the practice to other everyday practices, the career of practitioners and its development over time,

the author recognizes a series of opportunities regarding "element circulation, components and performance, relation between practices, and career of practice and practitioners." (p. 259). These contributions provide insights into the direction of design interventions derived from using a social practice theory approach rather than reporting on specific interventions.

From this description, it becomes clear that the contribution from design to the transition to a circular economy is expanding. Designers working on sustainability issues have developed methods and tools that operationalize theoretical insights about changes in consumption towards sustainability that are relevant and should inform the development of interventions to transform the economy.

4.   Research approach and methods

This chapter presents the methodological aspects of this research project. It starts by setting the general research goal, the research questions in the context of current knowledge and the chosen research methods for each of the research questions.

4.1. Research Goal

As presented in the introduction, this research project addresses three research questions corresponding to the main areas of work identified in the literature on consumption, circular economy, and circular offerings.

- RQ1: To what extent do circular value propositions change the consumption process?

Consumption in the circular economy changes as consumers become an active part of a company's supply chain as they move away from ownership into access-based value propositions. Understanding such changes becomes a must for companies aiming at delivering circular value propositions. Hence, there is a need for in-depth knowledge about the interactions that emerge between consumers and products beyond the point of sale. This research project empirically investigates the actions consumers perform during the use of a specific circular offering to map such interactions and increase current understanding of the topic, starting from an extended definition of consumption. This research question aims at expanding current knowledge about the nature of consumption in the circular economy.

- RQ2: What factors and conditions enable or hinder the acceptance and adoption of circular value propositions?

Although some understanding exists about the factors that influence consumers when participating in circular offerings as illustrated in the section about the state of the art, most of such studies are concerned about the intention not the behavior. Moreover, most of such studies are based on fictional scenarios created by researchers, which may limit the explanatory potential of their conclusions. Additionally, most of the current knowledge address consumers in industrialized countries, and little has been done regarding emerging economies. Through this research question, this project aims at providing empirical data about acceptance factors, not only in industrialized economies but in emerging economies, from functioning businesses. It also provides insights into conditions for the adoption of circular offerings, expanding the understanding of processes and aspects that can influence changes in consumption, towards circularity. Finally, and given the growing

use of digital tools to realize circular value propositions, through this research question, new data sources are explored.

- RQ3: What aspects should be considered in design tools for the circular economy?

Recent advocates of the circular economy have highlighted the crucial role design plays in enabling the transition to a circular economy. As a result, the development of several design tools for the circular economy has expanded. Considering that transforming consumption is an essential part of the process, design tools for circularity should consider consumption aspects. This research question aims at providing a conceptual framework about consumption aspects to be considered in circular design tools and at evaluating to what extent specific consumption and consumer perspectives are being integrated into new circular design tools. By providing a set of concepts that should be considered when developing circular offerings, this research question contributes to expanding embryonic guidance regarding this issue in the literature.

4.2. Research approach

Given the questions defined for this investigation, a qualitative methods approach was chosen. Qualitative research, as defined by Creswell & Poth (2017) "begins with assumptions and the use of interpretive/theoretical frameworks that inform the study of research problems addressing the meaning individuals or groups ascribe to a social or human problem. To study this problem, qualitative researchers use an emerging qualitative approach to inquiry, the collection of data in a natural setting sensitive to the people and places under study, and data analysis that is both inductive and deductive and establishes patterns or themes." (p. 8). Within this approach, the reality is not an object to be discovered but depends on the observer, and as such, it is multiple. This requires listening to a diversity of perspectives that can help build a rich picture of the problem. To achieve it, the research is mostly inductive, context-situated and adaptive in design.

As mentioned in the introduction, this research follows a pragmatic worldview or paradigm (Creswell & Poth, 2017). By choosing a pragmatic paradigm, this research project focuses on the outcomes of the inquiry and how they can help move towards a desired state of things, in this case, the acceptance and adoption of circular offerings by consumers. The assumption behind this stance is that moving towards the circular economy, and using circular offerings, is an improved state compared to the status quo, based on linearity.

A pragmatic framework acknowledges the historical character of the phenomenon to be studied and the influence political and social contexts play on it. For this research project, this translates into investigating different cultural contexts that help provide a richer understanding of the problem rather than delving deep into one case (Creswell, 2014). Using this perspective has resulted in the use of different research methods for the different studies, as described in the following paragraphs.

A primary concern regarding qualitative research is the standards of validation and evaluation of results. Validation is connected to the "trustworthiness" of a study, to what extent the researcher's interpretation of the data does reflect accurately the problem studied (Creswell & Poth, 2017). Several attempts to define validity criteria for qualitative research exist and as a result, they provide sets of criteria for assessment and techniques to reduce validity threats (Whittemore, Chase, & Mandle, 2001). Whittemore et al. synthesized the literature on the topic and indicated that primary criteria for validity include credibility, authenticity, criticality, integrity, while secondary criteria include auditability, vividness, creativity, thoroughness, congruence and sensitivity.

Credibility and authenticity refer to the ability of the researcher to convey the different perspectives of the study participants truthfully. This can be done by grounding explanations in descriptions and reflecting the context and experiences of participants. Authenticity is evident in the recognition of different voices informing the study and awareness of the inquirer's influence. Alongside credibility and authenticity are criticality and integrity. These aspects refer to the ability to reflect on one's hypotheses, contrasting examples and potential biases and ground analysis in the data rather than the researcher's values.

The secondary criterion explicitness refers to the ability to retrace the interpretative process followed by the researcher. Vividness requires researchers to present their data in a way that gives a clear picture of the phenomenon investigated. Creativity in designing and presenting research, i.e., finding new ways to collect, organize, interpret and present data can improve trustworthiness. Congruence refers to how well research questions, methods and findings fit together. Valid research should have a harmonious setting. Finally, sensitivity refers to the ethical aspects of the research, recognizing the different voices and being useful for the communities it serves. These aspects were considered when evaluating the validity of qualitative research.

4.3. Research Process

This section describes the methods used in each of the studies conducted to answer the different research questions.

4.3.1 Study 1: Literature review on consumption and the circular economy

The research process for this study was already introduced in section 3. State of the Art.

4.3.2 Study 2: User acceptance factor of digitally based fashion subscription services

This study had a double purpose. On the one hand, it addressed the question about what factors influence consumer acceptance of use-oriented PSS in the fashion sector. Acceptance was understood as the positive intention to participate in the solution. Thus, it followed a behavioral approach that draws from different theories from fields such as economics, psychology and cultural studies. On the other hand, it investigated the suitability of user-generated online reviews as a data source to answer questions about consumer acceptance. It first identified consumer acceptance factors for circular offerings in the fashion sector, i.e., reuse, product-service systems and sharing alternatives.

The study analyzed three companies offering digitally based use-oriented PSS in the fashion sector that have been established before 2014 to consumers in an industrialized country. Considering the limited number of real-life examples, the study followed a purposeful sampling strategy for selecting crucial cases (Creswell, 2014). Data was collected from different sources as it is required in a case study, including user-generated online reviews posted between January 2016 and December 2017. User-generated online reviews were collected from a third-party website, which granted permission to use these data in September 2017. The data used are described in Table 7.

Table 7 Data sources for case studies

Data source	Company A	Company B	Company C
User reviews	80	32	11
Terms of Use	Yes	Yes	Yes

Website documents	3	1	1

Data analysis followed a qualitative approach based on a dual-coding method starting with a combination of descriptive, structural, emotion, evaluation, and values coding strategies (Saldaña, 2009). The different codes were then themed around new topics. These themes were further reorganized around factors acceptance from the literature following an axial coding strategy. To analyze the suitability of user-generated online reviews, each review was contrasted against the criteria developed by Dholakia & Zhang (2004), Korfiatis et al. (2012), and Mauri and Minazzi (2013) The process was iterative based on comparing findings from the different data points, the reviews.

4.3.3 Study 3: Consumption process of use-oriented PSS in fashion

Study 3 empirically investigated what are the implications of circularity in the form of access-based value propositions for the consumption process understood from a social practice and sociology of consumption perspectives. Besides, it used the concept of the customer journey from service design to map the data collected. It followed a qualitative research design, investigating the company's and the customers' insights regarding the actions they had to perform to participate in a circular offering in the fashion sector effectively. It was based on a multi-case study approach, analyzing data from three firms providing this offering in the clothing sector in an industrialized economy context. Case study research design allows for an in-depth evaluation of a topic and it is adequate when the study intends to explore real-life, contemporary problems in their context (Eisenhardt, 1989; Stake, 2011). Case studies require multiple sources of information such as observations, interviews, audiovisual materials, documents and reports (Creswell & Poth, 2017).

Data was collected from different sources as it is required in a case study, including user-generated online reviews posted between January 2016 and December 2017, the company's documents, and company's websites available in August 2019. User-generated online reviews were collected from a third-party website which granted permission to use these data in September 2017. The data used are described in Table 7. Data were organized using NVivo 12 and analyzed following a double-cycle coding process (Saldaña, 2009). The process began with a within-case analysis where all sources for each were analyzed following a process-coding approach. Once actions were identified for each case, a structural coding strategy followed,

based on the theoretical framework used in the study. The actions identified in the data were grouped under the different moments of consumption suggested by Evans (2018) by answering guiding questions posed in the theoretical framework. The actions were also differentiated in terms of product and service.

4.3.4 Study 4: Emergence of swapping as a circular consumption practice in emerging economies

Study 4 was based on 12 interviews conducted with actors involved in three swapping initiatives in an emerging economy and visual material provided by the organizers. This study aimed to explore the question of why a circular offering such as clothes swapping engaged stakeholders in an emerging economy context using a social practice theory perspective. The study focused on an emerging economy as this was one of the research gaps identified in the literature study, i.e., the paucity in empirical studies from non-industrialized contexts. The interviews conducted during February 2018 via Skype and over the phone. In-depth interviews were chosen as they are an efficient form of collecting information as they allow participants to give detailed accounts of their experiences and perceptions, they let the researcher probe additional areas that arise during the conversation and help to reduce the risk of interviewer pre-judgment (Seale, 2004). This decision is supported by Hitchings' (2012) argument that individuals still matter and can provide valuable information regarding their role in the practice.

Table 8 Participants in study 4

Informant Code	Initiative	Role	Occupation	Gender
C010101	Initiative A	Organizer	Professional	Female
C010201	Initiative A	Participant	Digital entrepreneur	Female
C020101	Initiative B	Organizer	Professional	Female
C020201	Initiative B	Participant	Professional designer	Male
C030101	Initiative C	Organizer	Professional	Female
C030102	Initiative C	Organizer	Professional	Female
C030201	Initiative C	Participant	Community leader	Female
C030202	Initiative C	Participant	Professional	Female
C030203	Initiative C	Participant	Professional	Female

C030204	Initiative C	Participant	Professional	Female
C030301	Initiative C	Participant	Business owner	Male
C030302	Initiative C	Partner	Professional	Female

The data was analyzed following an interpretative approach using an iterative reading of the transcribed interviews (Kinsella, 2006). Transcribed interviews were coded based on the interview questions, significant statements, and meaning units by the main researcher. Significant statements refer to what the participants express concerning how they performed and experienced the swapping activity, on a personal level. These statements were then grouped under broader sets of information that called meaning units Creswell (2014) or themes Saldaña (2009) using NVivo 11 and 12.

4.3.5 Study 5: User acceptance of digitally based toy subscription services in India

Study 5 explored what factors influenced consumer acceptance of use-oriented PSS for toys. It followed a behavioral approach drawing from economic, psychological, and cultural theoretical frameworks such as the Theory of Planned Behavior. Data was collected through an online questionnaire. The questionnaire was developed using a secure online provider that enabled the anonymization of respondents. The online questionnaire first presented a summary of the project and asked for consent from participants. The second section collected general socio-demographic information. The third section explored factors connected to the product part of the offering including product type, price, product involvement and product quality. This section and the subsequent ones were only answered by people that reported to have used a use-oriented PSS for toys. The fourth section focuses on the service aspects, and it asks respondents about their experience with the service. The final section focused on personal characteristics of the user and was based on existing Likert scales assessing materialism (Richins, 2004), need for control (Burger & Cooper, 1979), status (Eastman et al., 1999), desire for uniqueness (Ruvio et al., 2008) and disposition towards sharing (Akbar et al., 2016).

In order to recruit participants, companies offering use-oriented PSS were identified using different web searches. Twelve companies were identified, and eleven were contacted. Two companies responded positively and sent out an email invitation in July 2019 and make a post on their Facebook groups, asking customers to fill the survey. The questionnaire was open for six weeks, collecting 37 responses, 36 from

company A and one from company B. Thus, only responses from company A were considered. Results from the questionnaire were compared to the literature about consumer factors. Company A is based in an emerging economy, thus contributing to the research gap identified in the state of the art regarding the need for more empirical studies from such types of economies.

4.3.6 Study 6: Consumption perspective in circular design tools

This study aimed at identifying what opportunities exist for integrating a consumption perspective in existing circular design tools. Circular design tools were selected for this study based on literature reviews on circular economy and design (Lofthouse & Prendeville, 2018; Mugge, 2018) and a web-based query in academic databases. From this analysis, 38 documents were identified and screened, and only 11 were described as design tools. Of these, we selected five tools using purposeful sampling, see Table 9.

Table 9 Circular design tools analyzed

Name	Circular Design Guide -CDG	CLab	Circular Economy Toolkit - CET	Business as Usual -BAU	Circular Pathfinder - CPF
Scope	Business model, Service, Product	Business model	Business model, Service, Product	Business model, Product	Business model, Service, Product
Type of tool	Analog design tool	Analog analysis tool	Online and analog prioritization tool	Analog analysis tool	Online identification tool
Expected outcome	Designs released on the market	Opportunities for design	Prioritized opportunities	Opportunities for engaging users in the design process	Identified circular strategies
Consumption and consumer-related aspects	Explicit: Customer experience, feedback, needs, and	Explicit: Customer needs and contexts	Implicit: Consumer behavior	Explicit: Consumer needs, experience, and	Explicit: Consumer behavior, consumer preferences

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considered	value	involvement

A template for analyzing how the five circular design tools consider and integrate aspects related to circular behaviors, acceptance, and adoption, was developed based on the findings from the previous studies comprising this doctoral research project. Insights about the tools were documented in four sections: section one summarizes general information about the tool; section two refers to the type of behaviors that are implicitly or explicitly considered; section three covers factors of acceptance; and section four addresses how the tools consider conditions of adoption. The analysis was carried out based on the data available online and documents provided by the developers of the tool. Worksheets and workshop guidelines were downloaded and used along with online instructions, reports and academic papers. Each tool was analyzed using the template. Once all tools were analyzed, a cross-tool analysis (Creswell, 2014) was performed to explore similarities and differences among the tools.

5. Results

This section summarizes the findings from the different studies and groups them under the research questions that they answer. The first subsection of this chapter presents the results of study 3, exploring the consumption process in the specific context of a circular value proposition for the product category clothes. Section 5.2 presents the findings of studies 2, 4, and 5, divided into two subsections, acceptance and adoption. Finally, section 5.3 describes the findings from study 6 which suggests what aspects should be integrated into design tools being developed to create circular value propositions. All studies used the results from study 1, the literature review about consumption issues in the circular economy and circular value propositions' literature.

5.1 Topic 1: To what extent do circular value propositions change the consumption process?

These findings were adapted from (Camacho-Otero, 2019) *published as part of this thesis.*

The purpose of Study 3 was to investigate how the consumption process changes in the context of circular value propositions. The study draws on the extended definition of consumption developed by Evans (2018) to analyze the actions consumers perform when participating in a use-oriented product-service system. The study attends to the need to improve the understanding of the circular economy from a consumption perspective. It analyzed the actions the users of three fashion subscription services offering clothes, short-term rentals, had to perform to capture the value offered. This section begins with a brief description and discussion of the consumption process. It then presents a description of each company's digital journey. The following section presents an analysis of these journeys according to the theoretical framework. The section ends with a discussion about the findings of the study, and how they answer the research question.

5.1.1 Get, use and throw: the linear consumption process

Recent attempts stemming from the Design for Sustainability field have offered some insight into how consumption is configured in the context of circular offerings. For example, Wastling et al. (2018) characterized some of the behavior's consumers need to engage when participating in circular business models such as PSS. More recently, Selvefors et al. (2018) expanded this perspective by offering a conceptualization of the circular economy from the user perspective. In both cases, they started from a limited perspective of consumption that consists of three steps:

acquisition or obtainment, use and disposal or riddance. Wastling et al. (2018) and Selvefors et al. (2019) included the processes by which products are discarded in their definition of consumption, following research on product lifetimes. Based on their approach, consumption is not only about acquiring and using resources but is also about how people get rid of them. This approach is in line with a recent contribution made by Evans (2018) who, building on Warde (2005), defined consumption as a series of moments that describe the process by which artifacts enter, stay and then leave the domestic realm (see Figure 6).

Figure 6 Moments of consumption

Even though Evans' definition does not refer to circularity explicitly, it fits into the concept of circularity as it is concerned with the processes by which products are deemed unfit by consumers and eventually could become waste. While Evans incorporates both acquisition and disposition as crucial moments of consumption, as the cited authors do, he further disaggregates the use phase of consumption into four moments that provide a higher level of granularity to the analysis: appropriation, appreciation, devaluation, and divestment. If the acquisition moment is about why people get goods and services, and disposition is about why people get rid of such products and services, then these intermediate moments address the processes that enable people to keep and let go of such goods and services. Since the circular economy aims at keeping materials and products in use, understanding how these moments work is fundamental as they offer opportunities for intervention supporting circulation.

5.1.2 A digital user's journey

To better understand the actions users perform when engaging with a circular offering, we used the journey map, a tool from the service design field. A user journey refers to the set of steps a consumer or user has to engage with to capture the value provided by an offering (Polaine, Løvlie, & Reason, 2013). The first outcome of this study is the user journeys for each company, as presented in Figure 7.

Company A

Sign up → Select a plan → ? → Add styles to your closet → Request items → Borrow + rent items → Get notification → Try the clothes → Be careful → Added variety → Lower costs → Less duties → Build identity → Need fit → Refer friends → Spend too much → Do extra work → Accept service failures → Wear items rarely → Ship the item → Notify return → Purchase the item → Keep the service or Cancel the service

Company B

Subscribe to service → Change your plan → Authorize periodic payment → Get a style recommendation → Pick items to rent → Change request → Try the clothes → Be careful → Provide feedback → Lower costs → Less duties → Refer friends → Pay extra costs → Send back items → Accept product responsibilities → Pause the service → Ship the item → Purchase the item → Keep the service or Cancel the service → Get notification

Company C

Register → Add to your plan → Authorize pre-paid payment → Browse the closet → Rent items → Try the clothes → Be careful → Provide feedback → Lower costs → Expanded wardrobe → Less duties → Refer friends → Pay extra costs → Do extra work → Accept service failures → Accept product responsibilities → Ship the item → Notify return → Get notification → Cancel the service

Figure 7 Digital user journey for three companies offering online fashion subscription services

Implications for consumption

These specific actions and their nature have essential implications for consumption. Because the case studies used are digital, the service is offered online, and people need to have access to an internet-enabled device and an internet connection. They also need to be part of the financial system and have access to credit, which excludes significant portions of the global population. Hence, the diffusion of these propositions is limited by these factors. Because the service is digital, customers are required to provide personal and financial data that needs to be stored and protected. By doing this, consumers are giving up some amount to control which in turn, companies providing this type of offering must be perceived as worthy of trust. Thus, companies need to offer security and privacy guarantees to customers. Such data allows the company to provide a convenient service that requires fewer tasks from the user.

In addition to these observations, it becomes clear that the product and service components influence the type of actions people perform. The service component starts with the registration and ends with the user keeping or canceling the service. The product component starts with the user browsing clothes collections and ends with the return or the purchase of the item. Thus, the consumption of this type of circular offerings is dual. On the one hand, and regarding the service, companies aim at maintaining the commercial relationship with the user in order to maximize their lifetime value. On the other hand, when dealing with products, companies would want people to quickly return the product (if the purchase option comes at a loss for the company) so they can put it back into circulation and maximize the value extracted.

In sum, and as illustrated by the previous paragraphs, the process of consuming circular offerings such as use-oriented product service system comprises multiple steps, requires tighter connections between provider and user, and results in different exchanges beyond physical and monetary elements. Accessing the product requires users to register, to provide information, to get feedback, to select items, and to use the items for a limited time. Getting new items requires consumers first to break links with the items they have, send them back, give feedback about the items, and to wait and to receive the item. The service has a different journey; people register, learn how to use it, appropriate it, but also get tired of it, pause it, and eventually cancel it. The user becomes a steward for the provider's items while the provider safeguards people's data. Their relationship is not one that starts and ends when the customer acquires the product but becomes intertwined along the

user's journey. Moreover, in the context of such new interactions, providers and customers not only engage in an economic transaction but in permanent information exchange.

5.1.3 Moments of consumption

The journeys identified were further analyzed in connection to the moments of consumption suggested by Evans. The different actions identified in the previous step were mapped against the moments of consumption suggested by Evans. This analysis resulted in a visualization of the consumption process differentiating by type of component and consumption moment. Figure 8 illustrates the first three moments.

Acquisition

Figure 8 illustrates the different actions people engage with for acquiring, appropriating, and appreciating the offering. Registering, choosing a plan and making the periodic payment are part of the acquisition phase. By engaging in these actions, people get access to the service. Once the first use cycle has finished, users do not need to perform any of these activities again while using the service, unless they want to change their plan, update information. Payment is automatically debited from their debit method, so no live action is required. The acquisition moment for the clothes includes actions that will be repeated while using the service. These actions are clothes selection and reception, which vary among companies as described in the previous section.
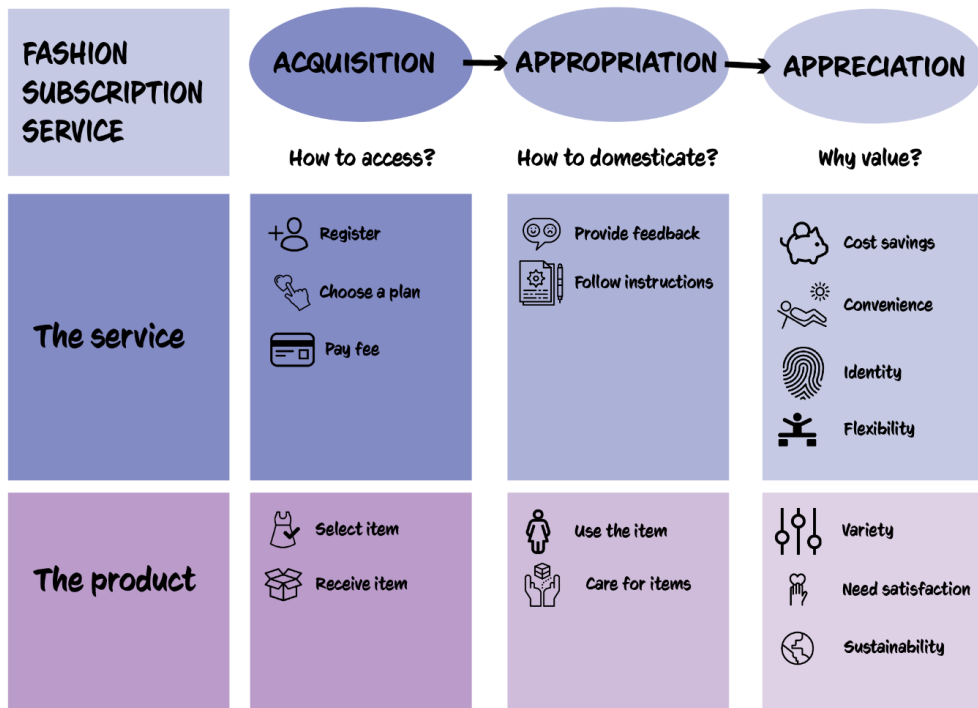
Figure 8 Consumption moment enabling the use of fashion subscription services

Appropriation

The second moment of appropriation refers to the strategies that users have for domesticating the offering to make it their own. Regarding the service, people achieve these by following the company's instructions and providing feedback. Service appropriation is achieved by offering customers a sense of co-creation, control and knowledge (Mifsud et al., 2015) which are all present in the different actions that people perform while using the service. For example, the actions that enable acquisition of the product part of the offering can contribute to the appropriation of the service as they can contribute to these aspects. During this moment, people appropriate clothes by wearing them and being careful.

Appreciation

Finally, appreciation is the result of different value types the offering creates. The service helps save costs; it is convenient and contributes to building identity, as mentioned earlier. From a product perspective, variety, need-fit, and

helping to protect the planet are the reasons why users appreciate it. If an item is highly appreciated, people have the option to purchase it at a discounted price. Because this study focuses on the fashion subscription service, a purchase is conceptualized here as a form of disposition.

Devaluation

The process by which consumers leave offerings behind starts with a devaluation phase in which the offering stops delivering all or some types of value. Economists and accountants refer to this phenomenon as depreciation. As described in Figure 9, devaluation of the service occurs when people need to pay extra costs, do more work, and when the company fails to deliver in their promise as described earlier. The data did not provide information about why people the product is not appreciated any longer, a limitation of this study.

Divestment

Nevertheless, some reviewers indicated that items are used less often before they decide to return them, so this action was classified under divestment as it represents the detachment resulting from not valuing the item anymore. The user disposes of the clothes by returning them through the designated bag. In terms of the service, when people have encounter problems that limit the advantages they get from the service as illustrated in the devaluation moment, they can pause the service which means they do not have to pay the subscription fee. However, they need to return the items they still have and will not get any new products.

Disposal

If during this moment of consumption, value is not regained, people can opt for canceling the service, which means they will no longer use it. People need to notify their decision to the provider so they can cancel their payments. Otherwise, it will not happen, as illustrated by some of the reviews.
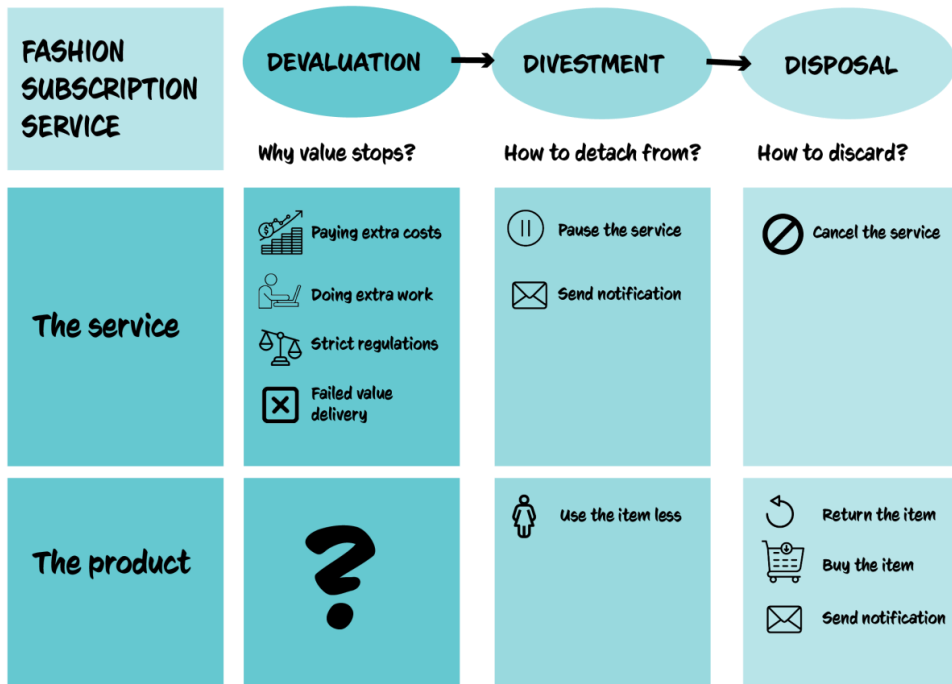
Figure 9 Consumption moment enabling the use of fashion subscription services

An extended consumption process in the circular economy

This study addressed the question about the implications of circularity for consumption by analyzing the user journey of an existing type of circular offering. Based on this analysis, the study analyzed what steps users needed to take to get value from the offering, what steps were connected to the product and the service components of the offering, and the requirements each step created. It then mapped these actions against an extended definition of consumption Evans to explore to what extent consumption processes of use-oriented PSS fit in such an approach. By using this perspective, it was possible to identify in detail, how people access use-oriented PSS, how they integrate such offerings in their daily lives, why did they appreciate them, why such offerings lost their value, how people pushed them away and finally, how did they dispose of them. The data offered meaningful insights regarding the service component of the offering but fell short in providing information about why the products in the offering exited their domestic space.

This study contributes to the growing body of literature interested in the consumption side of the circular economy both methodologically and theoretically. From a methodological perspective, through exploring the user journey, the study provided a detailed and chronological account of the user actions involved in the consumption of the circular offering. This tool allowed for the distinction between the product and the service component. However, because it is, in principle linear, it proved difficult to map the circular dynamic of the offering. From a theoretical perspective, this study showed that an expanded understanding of consumption, that puts more importance to the use-phases by disaggregating them, can help better understand how circularity effects on consumption.

5.2 Topic 2: What factors and conditions enable or hinder the acceptance and the adoption of circular value propositions?

These findings were adapted from (Camacho-Otero, 2018, 2019; Camacho-Otero, Boks, & Pettersen, 2019) *published as part of this thesis.*

This section presents the results from studies 2, 4, and 5 addressing research question 2. Studies 2 and 5 focused on exploring factors of acceptance for two product categories with significant opportunities for improving resource efficiency, clothes and toys. Additionally, study 2 used user-generated online reviews as a novel data source to explore digitally based circular value propositions. Study 5 used an online questionnaire to answer the research question qualitatively. Study 4 investigated the adoption of circular consumption practices, moving away from a behavioral approach. By using a social practice perspective, it provides insights into the conditions that enabled the practice of swapping to attract practitioners, in an emerging economy context.

5.2.1 Accepting circular value propositions

For study 2, the first step was to identify what the literature on consumer acceptance of circular offerings suggested. Based on a review, four categories of factors influencing consumer acceptance were identified as economic, psycho-social, cultural and socio-material as listed in Table 10.

Table 10 Consumer acceptance factors for circular offerings in the fashion sector in the literature

Category	Factor	Literature
Economic	**Costs**	(Armstrong et al., 2015; Cervellon et al., 2012; Laitala, 2014b; Matthews and Hodges, 2016; Pedersen and Netter, 2015; Petersen and Riisberg, 2017; Rexfelt and Hiort af Ornäs, 2009; Roux and Guiot, 2008)
	Gratification	(Gopalakrishnan and Matthews, 2018; Matthews and Hodges, 2016; Pedersen and Netter, 2015)
	Offering	(Akbar et al., 2016; Armstrong et al., 2016; Laitala, 2014b; Park and Armstrong, 2017; Roux and Guiot, 2008)
	Income	(Gwozdz et al., 2017; Weber et al., 2017)
	Information	(Matthews and Hodges, 2016; Petersen and Riisberg, 2017)
	Price	(Armstrong et al., 2016; Gopalakrishnan and Matthews, 2018; Park and Armstrong, 2017; Roux and Guiot, 2008)
	Risks	(Armstrong et al., 2016, 2015; Laitala, 2014b; Matthews and Hodges, 2016; Park and Armstrong, 2017; Rexfelt and Hiort af Ornäs, 2009)
Demographic	**Age**	(Armstrong et al., 2016; Gopalakrishnan and Matthews, 2018; Weber et al., 2017)
	Gender	(Gopalakrishnan and Matthews, 2018; Gwozdz et al., 2017; Pedersen and Netter, 2015; Weber et al., 2017)
	Level of education	(Cervellon et al., 2012)
	Geographical location	(Gwozdz et al., 2017)
Psychosocial	**Attitude**	(Akbar et al., 2016; Johnson et al., 2016; Lang and Armstrong, 2018; Park and Armstrong, 2017)
	Behaviors	(Gopalakrishnan and Matthews, 2018; Gwozdz et al., 2017)
	Environmental values	(Armstrong et al., 2015; Cervellon et al., 2012; Gopalakrishnan and Matthews, 2018; Gwozdz et al., 2017; Laitala, 2014b;

		Pedersen and Netter, 2015; Petersen and Riisberg, 2017; Roux and Guiot, 2008)
	Materialism	(Akbar et al., 2016; Johnson et al., 2016; Lang and Armstrong, 2018; Roux and Guiot, 2008)]
	Subjective norms	(Johnson et al., 2016; Lang and Armstrong, 2018)
	Other	(Cervellon et al., 2012; Johnson et al., 2016; Lang and Armstrong, 2018; Roux and Guiot, 2008)
Cultural	**Desire for change**	(Armstrong et al., 2016, 2015)
	Experience	(Gopalakrishnan and Matthews, 2018; Laitala, 2014b; Roux and Guiot, 2008)
	Experiment	(Armstrong et al., 2016, 2015; Pedersen and Netter, 2015)
	Fashion involvement	(Cervellon et al., 2012; Laitala, 2014b; Lang and Armstrong, 2018; Pedersen and Netter, 2015; Weber et al., 2017)
	Interaction	(Matthews and Hodges, 2016; Park and Armstrong, 2017; Pedersen and Netter, 2015; Petersen and Riisberg, 2017; Rexfelt and Hiort af Ornäs, 2009; Roux and Guiot, 2008)
	Uniqueness	(Akbar et al., 2016; Cervellon et al., 2012; Lang and Armstrong, 2018; Roux and Guiot, 2008)
	Political position	(Park and Armstrong, 2017; Roux and Guiot, 2008)
	Identity and status	(Cervellon et al., 2012; Laitala, 2014a)
Socio-material	**Daily life**	(Matthews and Hodges, 2016; Rexfelt and Hiort af Ornäs, 2009)
	Ease of use	(Armstrong et al., 2016, 2015; Pedersen and Netter, 2015)
	Legal	(Park and Armstrong, 2017; Petersen and Riisberg, 2017)
	Location	(Gwozdz et al., 2017; Pedersen and Netter, 2015)
	Technology	(Netter, 2017)

The second step was to investigate empirically which of the factors in the literature were relevant for use-oriented PSS customers. Figure 10 presents the frequency distribution for the different factors found in the reviews. The following paragraphs describe the main findings for each category of factors. Additionally, the study also assesses the suitability of using user-generated online reviews for investigating this type of question. The final subsection discusses the findings in this respect.
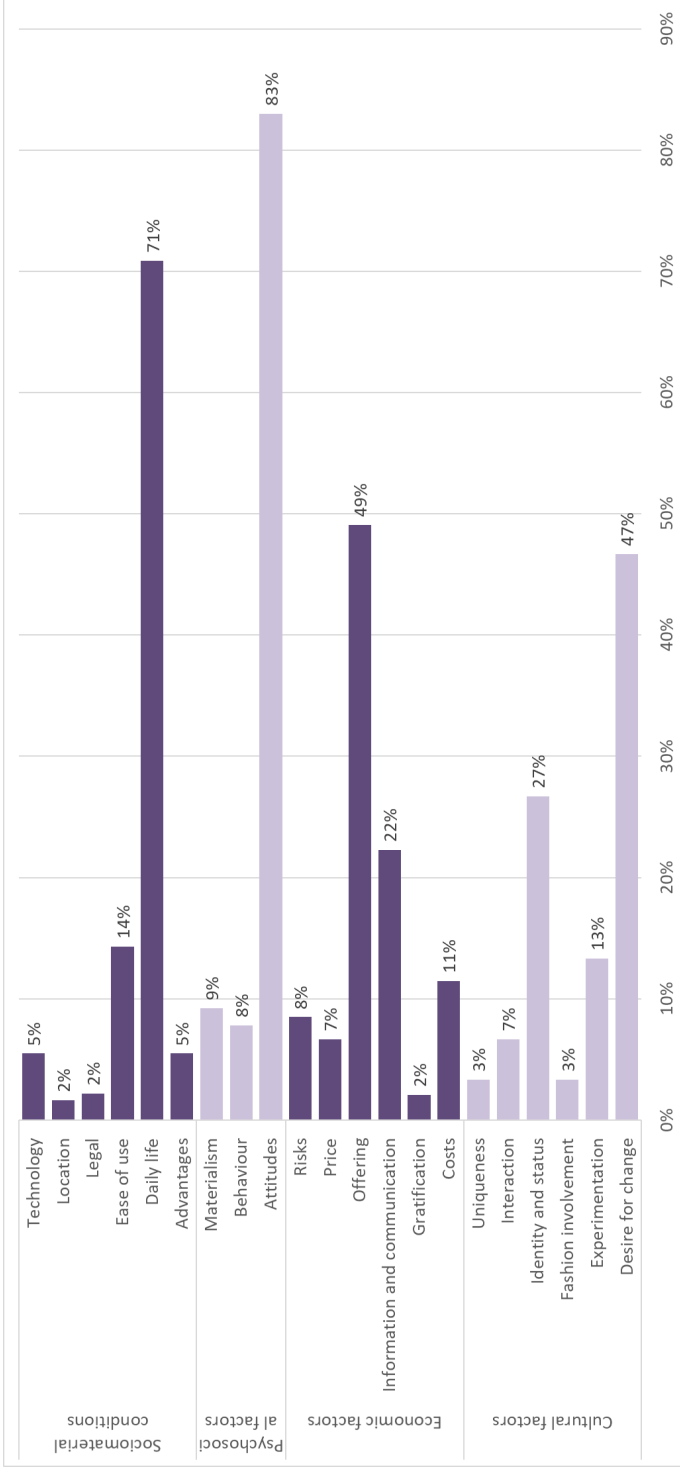
Figure 10 Frequency distribution of factors mentioned in the user-generated online reviews

Economic factors

Regarding costs, it was found that reviewers mostly value the potential savings resulting from this type of offerings, while potential transaction costs were a concern. For example, some users pointed to how the service helped them save costs on avoided purchases and dry-cleaning costs. Others mentioned that because companies automatically debited credit cards and failed to cancel accounts when requested, they had been paying for a service they had not used. This example points towards the risks associated with this business model, particularly regarding automatic payment methods.

Reviewers also indicated that gratification, or the potential of the solution to offer a benefit that is not only financial, was also relevant in their assessment. For example, some users reported unusual and frequent compliments to their appearance when using the clothes from the service. Regarding the offering, reviewers reported that the type of product, its quality, the materials, how it matches the user's style, and in more practical terms, if it fits, are all aspects they considered. Some reviewers reported clothes being smelly and looking worn out, which influenced their opinion about the service.

The income factor was not mentioned explicitly in the reviews. Regarding information, some reviewers found it difficult to find information about how the service worked. They had to rely on other user's reviews to understand the service. Additionally, reviewers assessed the service against the company's ability to give prompt and clear responses. The price was mentioned as an essential factor, as well. The services were perceived as somewhat expensive by some of the reviewers when comparing the number of clothes, and they get every month and the monthly fee. Finally, the business model was perceived as risky by some reviewers because of the payment arrangements, because the clothes selection is limited, and clothes may be of low quality.

Socio material factors

Reviewers mentioned socio-material factors very frequently as well. User-generated reviews provided a level of detail regarding the activities people get involved in or avoid as a result of participating in such offerings. This insight allows an improved understanding of the impacts the solution had on the user's daily life, as presented in Table 11. These activities were organized following Rexfelt and Hiort af Ornäs (2009) framework of required, avoided and resulting activities.

Moreover, the different activities are organized according to the service journey, before, during and after. Pre-order refers to the process of deciding what to order. Order is the stage when a client asks for a specific set of garments. The use phase refers to the enjoyment of the items, and post-use refers to the return of the clothes.

Table 11 Impact on everyday life: changes in activities

Type of activity	Before	During		After
Required	Planning/waiting for the dress/ordering in advance	Trying the free month	Keeping the closet full/choosing what to wear	Purchasing/keeping items
	Read items reviews/writing reviews	Checking new things/unsubscribing from emails	Returning the dress	N.A.
	Figuring out size/fitting perfectly	Using the priority button	Marked items as returned	N.A.
	Shopping online	Putting items on hold	Recording proof of return	N.A.
Avoided	N.A.	Choosing what to wear	Wearing clothes rarely	N.A.
	N.A.	Going out	Not laundry	N.A.
	N.A.	Having to purchase/not spending lots of money		N.A.
Resulting	N.A.	Changing wardrobe	Trying new things	Returning customer/keeping the service/upgrading service
	N.A.	Try it before you buy it		Referral

Psychosocial factors

Psychosocial factors come in third place regarding frequency. However, and contrasting with the previous two sets of factors, reviewers mentioned this type

of factors less often. Within this category, attitudes were the most popular aspect (83% of items coded), followed by materialism (9%) and behavior (8%). Attitudes refer to de evaluation people make of a behavior referencing their values and beliefs (Klöckner, 2015), if the behavior is in line with their values and beliefs, people will most likely have a positive attitude and vice versa. Other behaviors have also been linked to a positive intention towards circular offerings. In the data, some reviewers indicated the service helped them cope with chaotic environments at home and work.

Regarding materialism, some reviewers indicated that they valued possessions and had enjoyed spending money in buying stuff and that the service helped them cope with that desire. Other reviewers indicated that they valued the service because it enables them to be adventurous because it was flexible. Factors that were prominent in existing literature such as values (specifically, environmental values), were not observable in the data. This could happen, in part, because of the nature of the data as reviewers are expected to comment on their experience with the service and the way companies communicate their offering rather than their personality and motivations. Other aspects such as nostalgia, previous experiences, perceived behavioral control and integrity that were explored by academics were not mentioned in the reviews either. Thus, online reviews may not be enough to provide insights about the internal user characteristics, such as values, beliefs or norms.

Cultural factors

This set of factors was the least mentioned in the empirical data. The reviews that addressed this issue focused on how the service helped them satisfy their desire for change via enabling experimentation at lower costs since customers have access to an expanded wardrobe many times greater than what an individual could afford. Economies of scale enable variety. Because of this opportunity, some reviewers indicated that the service enabled them to explore a fashionista identity that they did not have. Also connected, the literature indicates that this type of circular offerings can help enhance the desire for uniqueness and the need to differentiate oneself from others. However, in the data, what was found was the opposite. A reviewer reported that she saw people wearing clothes she had seen on the website of one of the companies, giving her the feeling of lack of uniqueness. This occurrence is anecdotal but points out to a side effect of this type of service.

Other aspects brought up in the literature, such as interaction, experience and political positions, were not mentioned in the reviews. We suggest two reasons

to explain this. The nature of the reviews does not invite reviewers to elaborate on such events or the nature of the offering does not address such aspects. The latter can happen because of the digital nature of the reviewed businesses which may reduce the user's interaction with the company as compared to other forms of collaborative consumption, e.g., swap parties or fashion libraries. It could also be the result of the offering being a PSS, where the transaction happens between a company and a user and not among peers, such social interaction is hindered as well. Finally, and regarding political consumerism, these companies are not marketed as defying the current economic model, on the contrary, they are presented as an evolution of traditional retail channels. Thus, users may not perceive the business offering as a form to address these aspects.

Novel data sources for exploring consumption issues

The digital nature of some of the circular offerings emerging opens novel sources of data such as user-generated online reviews for further exploring user issues (Cui et al., 2012). Existing literature on user acceptance of circular offerings in the fashion sector has yet to explore the potential such source offers to understand better factors and conditions influencing demand. Thus, this study also explored the credibility of the reviews and their suitability compared to other sources of data. Regarding the credibility of the reviews, three aspects were considered, the availability of personal information, the description of the first-hand experience and the balance between the positive and negative aspects of the review. Seven aspects were considered to assess the suitability of user-generated online reviews in comparison to other sources: the type of input, e.g., if it is text-based as opposed to audio-visual, public availability, anonymity, unbiased, unsolicited, reliability and geographic diversity. The selected site for collecting the empirical data used in this study requires reviewers to provide necessary personal data such as name, last name and email. It also provides guidelines for reviewers to provide relevant information and requires reviews to be at least 100 characters long. Although they cannot guarantee that users will follow their guidelines, they have developed a tool for other users to mark a review as useful or not. In this sense, using online reviews from a third-party site can help improve credibility.

User-generated online reviews used in this study proved to be credible and suitable for analysis. They helped gain detailed insights regarding the offering's features that were more relevant for real users. They also provided insights about how the offering influenced their daily lives, an area lacking information

from real-life experiences. Besides, via online reviews, we were able to access a significant number of subjects (123) and gather information about their experiences, which would have been more difficult using traditional data collection techniques such as interviews or focus groups. Nonetheless, the information provided in the reviews did not offer much understanding regarding more personal or unconscious factors gathered under the psychosocial and cultural categories.

Study 5 used the approach proposed by Schrader (1999) categorizing factors according to their connection to the product, the service, and the user. This study explored to what extent users of an existing use-oriented PSS for toys considered the factors suggested in the literature. Table 12 presents the factors investigated.

Table 12 Consumer acceptance factors for use-oriented PSS

Category	Factor	Literature
Product	Price	(Paundra et al., 2017)
	Product type	(Schrader, 1999)
	Product involvement	(Bardhi & Eckhardt, 2012; Lee & Kim, 2018; Paundra et al., 2017; Philip et al., 2015)
	Product quality	(Baxter et al., 2017)
Service	Environmental benefits	(Catulli, 2012; Hazen et al., 2016; Van Weelden, Mugge, & Bakker, 2016)
	Financial benefits	(Lawson et al., 2016; Schaefers, Lawson, & Kukar-Kinney, 2016; Tussyadiah & Pesonen, 2016)
	Social benefits	(Lutz et al., 2017; Shuai Yang, Song, Chen, & Xia, 2017) and (Tussyadiah & Pesonen, 2016)
	Convenience	(Jae-Hun Joo, 2017) (Tussyadiah, 2016) (Rexfelt & Hiort af Ornäs, 2009)
	Experience	(Ozanne & Ballantine, 2010)
	Trust in the provider	(Barnes & Mattsson, 2017; Möhlmann, 2015)
	Product knowledge	(Catulli & Reed, 2017; Wang & Hazen, 2016)

Consumer	Gender	(Gopalakrishnan and Matthews, 2018; Gwozdz et al., 2017; Pedersen and Netter, 2015; Weber et al., 2017)
	Age	(Akbar et al., 2016; Prieto, Baltas, & Stan, 2017).
	Income	(Gwozdz et al., 2017; Weber et al., 2017)
	Education	(Gaur, Amini, Banerjee, & Gupta, 2015; Lakatos, Dan, Cioca, Bacali, & Ciobanu, 2016) and (Ballús-Armet et al., 2014)
	Materialism	(Ozanne & Ballantine, 2010) (Davidson et al., 2017; Lawson et al., 2016).
	Control	(Jiménez-Parra et al., 2014; Johnson et al., 2016; Khor & Hazen, 2017; Michaud & Llerena, 2011)
	Status	(Catulli et al., 2016, 2017; Lawson et al., 2016; Wilhelms et al., 2017) (Tussyadiah & Pesonen, 2016)
	Uniqueness	(Lang & Armstrong, 2018)
	Sharing	(Geiger et al., 2017)

The second step in study 5 was to collect data from customers of a use-oriented PSS through an online questionnaire investigating the different factors influencing acceptance. The questionnaire had three main questions. The first section collected socio-demographic data. The second section focused on the respondent's perception of the factors involved with the product. The third section addressed the factors connected to the service. The final session was concerned with the respondent's characteristics. The following subsections summarize the main findings for each of these sections.

The user

From a demographic perspective and as illustrated in Table 13, users were mostly female (62%) in their early 30s (54%). Nonusers were mostly female at the age range extremes, in their 20s and 40s. Most households have one young child between one and six years old. Most users have one child, while users 43% chance of having two children. Most non-users have a bachelor, while most users have a master. Regarding employment, only three respondents were unemployed at the time of the survey, one user and two non-users. Almost

half of the respondents were full-time employees working more than 35 hours per week, while near one quarter reported being self-employed. These results are consistent with suggestions from the literature that indicate that younger, highly educated people could be more attracted to innovative services such as use-oriented PSS.

Table 13 Socio-demographic characteristics

Number of children	Count	%
One	28	78%
Two	8	22%
Total	**36**	**100%**

Children's age range	Count	%
1-3 years old	13	36%
3-6 years old	17	47%
Less than 1 year old	2	6%
Over 6 years old	4	11%
Total	**36**	**100%**

Education level	Count	%
Bachelor	16	44%
Master	17	47%
PhD or more	3	8%
Total	**36**	**100%**

Employment type	Count	%
Self-employed (10-35 hou	2	6%
Self-employed (35 or mor	9	25%
Unemployed	3	8%
Working full-time paid er	17	47%
Working part-time paid e	5	14%
Total	**36**	**100%**

In addition to demographic variables, the study explored five additional factors connected to the user, attitude towards control, status, and sharing as well as materialistic values, and desire for uniqueness. Table 14 presents the percentage of respondents per Likert item according to the agreement level

Table 14 Frequency of respondents per level of agreement and Likert item

Component	Question	I strongly agree	I agree	Neutral	I disagree	I strongly disagree	Total
Control	I try to avoid situations where someone else tells me what to do	3%	29%	29%	35%	3%	100%
	I am enjoy being able to influence the actions of others	13%	48%	29%	10%	0%	100%
	I would rather have someone else took over the leadership role	0%	10%	42%	32%	16%	100%
Materialism	I admire people who own expensive homes, cars, and clothes.	0%	6%	42%	23%	29%	100%
	I like a lot of luxury in my life.	10%	16%	29%	26%	19%	100%
	I would be happier if I could afford to buy more things.	13%	19%	29%	26%	13%	100%
Status	I would get a product just because it has status	0%	13%	6%	39%	42%	100%
	I would pay more for a product if it had status	0%	16%	13%	42%	29%	100%
	The status of a product is irrelevant to me	23%	32%	13%	32%	0%	100%
	I own a unique collection (knifes, stamps, coins, etc).	3%	19%	13%	45%	19%	100%
Uniqueness	As a rule, I dislike products or brands that are customarily bought by everyone.	0%	6%	55%	32%	6%	100%
	I actively seek to develop my personal uniqueness by buying special products or brands.	6%	32%	23%	26%	13%	100%
	I have a high willingness to use things together with others for a fee	6%	45%	45%	3%	0%	100%
Sharing	Sharing consumer goods with others for a fee is a good alternative to ownership.	26%	55%	16%	3%	0%	100%
	In the future I will share more instead of buying	23%	45%	32%	0%	0%	100%

The desire for control was explored using items from the scale developed by Burger and Cooper (1979). The questions in this section addressed three aspects, avoiding being told what to do, influencing others, and giving up control. Even though respondents tended to place their answers in the mid-point, a critical portion disagreed with the two statements suggesting giving up control (35% and 32%) and agreed with the one referring to influencing others (48%). Lack of control has been considered as a factor influencing negatively the intention to participate in circular offerings by Jiménez-Parra et al. (2014) and Johnson et al. (2016). The study addressed materialistic values using items developed by Richins (2004). Most respondents indicated that they disagreed or strongly disagreed with the statements involving luxury and admiration to others because of expensive possessions but were less definite regarding the option of having more things. Some respondents indicated that they strongly agree with the statements about having much luxury in their lives and wishing to have more things. Materialistic values do not seem to be widespread among the respondents.

The question about attitudes towards status had a similar response. Most respondents disagreed or strongly disagreed with the items used, and they indicated they did not get products because they afford status or pay more. In general, most of the respondents did not care about such meanings. For evaluating the desire for uniqueness, the study used items from Ruvio et al. (2008). The results from the questionnaire did not show if respondents had a clear position regarding the importance of uniqueness. Most responses were either neutral or divided between agreement and disagreement. If anything, respondents did not regard uniqueness as relevant. The last question regarding attitude towards sharing shows that most respondents agree with the statements used from (Akbar et al., 2016) instrument. Hence, people using this service think sharing is an excellent alternative to ownership and expect to use it more in the future.

The product

Six different examples of toys were provided to explore the type of products accessed via the service, which correspond to the three main categories of toys, learning and development, socialization and commodification toys. Most accessed toy types were development and learning exemplified with The Rainbow Tower® and the Stroll & Discovery Activity Walker®. Some respondents indicated that they used the service to use Lego®, also considered here as a learning and development toy.

Socialization toys were represented using an excavator and a make-up kit as they are marketed primarily to boys and girls, respectively. According to the results, 61% of the respondents used the service to access toys like the excavator, and only 25% for accessing toys such as the make-up set. The last category refers to toys developed to engage children with media characters. We chose a Transformers® action figure and a Barbie® family. These toys were the least accessed via the service. Within this product category, parents use the service to access rather durable, high-priced products.

Regarding the price, most respondents indicated that they considered it to be about right (68%), while the rest considered that it was somehow high and too high (32%). Most of the parents in this last group have one child. The third element influencing the intention to participate in this type of solution is the level of product involvement or how relevant a product is for the customer. Given the nature of the product, this relationship may be mediated by the parent-child relationship. According to the findings, most respondents declared a high level of involvement with the product. This finding seems to contradict previous research which suggests that high involvement may hinder participation in this type of offering (Lee & Kim, 2018; Paundra et al., 2017). Finally, the quality of the toys was assessed as high, reaching an average of 84 points over 100.

The service

The second set of factors influencing acceptance refers to the service. The first aspect that influences the acceptance of a service is the relative advantages it offers. This aspect was investigated in the questionnaire by asking respondents what type of benefits they got from using the services. The options available included financial, environmental and social benefits. *"My kids get more variety"* was the benefit most selected by respondents, followed by *"I buy fewer toys."* The least chosen ones were items under the social category, *"I belong to a community"* and *"I meet other parents."* In the environmental category, *"We do not throw away toys"* was selected by most respondents. Compared with previous literature, these results support the idea that reduced consumption is an advantage of these services but contrasts with the idea that they are used to improve social connections. They also show how waste prevention is an essential aspect for users of the service. Finally, financial advantages, as saving money and buying less, are still good reasons for parents to engage with this solution confirming previous findings.

The second aspect related to the service and suggested by Schrader (1999) is its compatibility. The questionnaire addressed this issue by asking about the convenience of using the service. Most respondents found the service very

convenient. As expressed by one of the respondents, *"We can make our own preference list. And pick up and drop has no hassle."* However, one user indicated the service was somewhat inconvenient because *"It's a disturbance to take n return (after packing) Small parts get lost."* Other aspects relevant for respondents in this regard include good customer care, regularity in their deliveries, flexibility, door to door service, ability to choose items, and no extra charges. In addition to the convenience aspect, respondents were asked about the overall experience with the service. Most respondents were satisfied and very satisfied with the service. Only one respondent expressed dissatisfaction with the service. In the literature, compatibility is also connected to characteristics of the consumer, in terms of psychological ownership and control. These aspects were explored and will be discussed in the following subsection.

The two last aspects suggested by Schrader are observability and trialability. In this study, observability was treated as the kind of information people get about the product in the offering in terms of materials, previous users, and instructions for use. Most respondents indicated they got information about instructions for use and materials. No information about who was the last user was provided. Finally, trialability was addressed by asking questions about the likelihood of the provider making mistakes regarding the service and customer service quality. This aspect was explored by asking users to what extent they would agree or disagree with a set of statements about the provider making mistakes, making unauthorized charges to their payment method and accepting returns and replacing toys. Regarding the first two aspects, 64% and 79% of respondents indicated that they disagree and totally disagree with statements suggesting that the provider would make such mistakes. Regarding accepting returns and replacing toys, 68% of the respondents agreed and strongly agreed with the statement.

5.2.2 Adopting circular consumption practices

According to the literature on sustainable consumption exploring why consumption patterns may change, the intention to perform a behavior, i.e., the acceptance may not be enough to explain such changes. An alternative approach is based on consumption practices, and it explores the processes by which innovative practices emerge and attract practitioners. Study 4 used this approach to analyze the development of clothes swapping as a circular practice in emerging economies.

The purpose of clothes swapping

First, we identified the purpose behind the practitioners' engagement with the practice. Regarding organizers, two main reasons emerge, a concern for the environmental and social negative impacts of the textile industry and the lack of sustainable options in the local market. Second, the need for innovative approaches to promote sustainable consumption in an institutional environment. Participants also had different reasons for taking part in the clothes swapping events.

On the one hand, people were looking for different clothes or themselves or their families. On the other hand, participants did so for business reasons. For example, a designer used swapping events to find materials for his products and an entrepreneur used it to find inventory to sell online through her online store. A third purpose was connected to a more charitable objective, to find clothes for incarcerated children who were soon to be released and needed clothes.

The elements of the practice

Materials

Materials refer to the physical entities used in organizing and performing the swapping. In the initiatives studied, materials refer to the clothes being swapped, the place where the event is held, and other physical elements required to execute the events. Most of the clothes brought to the events were women's clothes, indicating a strong gender bias. As the organizer of Initiative B explained: *"Regarding clothes, I have noticed that women between 25 and 40 years old are the target group".* Items such as dresses, shirts, pants, and jackets were reported as the most common pieces brought in all initiatives. Underwear either explicitly or implicitly was forbidden by all initiatives. Unique items such as costumes and baby clothes were also exchanged on at least one occasion in two of the initiatives.

Regarding quality, interviewees reported that they mostly brought and found clothes in "good shape": "*Clothes are in very good shape. I think people that bring clothes do not bring old, stained garments, but clothes that are in very good shape*". Brands were also mentioned as an important aspect of the clothes being swapped as people preferred known names. In one case, the swap was not only about clothes but also books. It was a strategy to broaden the audience.

All the organizers used alternative places to organize their events, i.e., spaces usually not used for clothes acquisition. They used public spaces like schools,

hotels, cafes, co-working offices and, in one case, their own private homes, which they transformed to host the event. Organizers indicated the importance of making the space attractive and looking like a store because of meanings associated with second-hand clothes (for further explanation, see section 5.2.1). To achieve this, they used equipment and accessories that are typical of a clothing store such as exhibition racks, mirrors and changing rooms. Additionally, they added visual aids to convey messages of sustainability and community. Two of the three initiatives included parallel activities. Initiative C invited local entrepreneurs to sell their organic products following specific rules to assure sustainability as well as local artists to entertain the assistants. Initiative B combined the swapping event with a trade fair for second-hand and eco-products. Both were intended to help local actors' network.

All organizers were women. Initiatives A and B were organized by invested individuals that manifested having a concern about the environmental impacts of the clothing sector. Initiative C was arranged by a local organization lead only by women who saw in the swapping a form for strengthening community bonds in their context. All organizers have a university education and come from the capital city. Initiative A and B worked with volunteers that helped them during the event. Initiative C had a more complex organization using committees that helped plan, implement and assess the event. Although the material requirements for the initiatives do not seem to be complicated, organizers indicated that finding the place and motivated people to volunteer was challenging. In contrast, they did not have problems getting clothes for the exchange; they had to offer alternatives for people to dispose of garments that would not be accepted in the event.

Skills, competence, and rules

Competence refers to the knowledge required to operate the materials, perform the practice and evaluate the outcome. Within this element, rules are also included. They refer to the codes of conduct practitioners need to follow. Regarding competence, participants should be able to select the clothes they would bring to the swap and the ones they would take home. This included selecting clothes that were in good shape, and that would be the right fit. Additionally, they needed to select garments from their wardrobes that would fit the rules and expectations of other swappers. Finally, once they bring the clothes home, they should know what to do with them, if they need to be washed or repaired. According to some participants, they did wash them although the clothes seemed clean.

In addition to competence, practices also include rules or codes of conduct. In all the initiatives analyzed, organizers had explicit rules swappers should follow if they wanted to participate in the events. Such rules referred to the type of clothes or articles that people could bring and the expected behaviors during the event. Swappers indicated that in general, taking part in the events was not difficult and if they did not have information about how to do so beforehand, they got it during the event. Initiative C had developed a very detailed methodology to implement the event including instructions on how to solve conflicts. In that specific case, the organizers of initiative C developed a gaming strategy to avoid conflict over specific items. As one participant explained: *"and for example, if another person ends up taking the same garment that I wanted, and I didn't manage to take it first, to avoid an argument, they play – what is the name?- ah yes, paper and scissors, something like that."*

Meanings and images

The third element of a practice is the meanings and images it evokes. We found that swapping in this context had two primary meanings. On the one hand, it was associated with traditional communal forms of acquiring products by indigenous communities. As expressed by one participant *"When someone talks about swapping it reminds me that it was mainly done by indians, indigenous peoples sorry, to trade chicken for cassava",* or farmers*: "Swapping was something that my mother told us about, that my dad, when they were children, their parents did it, exchange things. But then it was food, produce plantains, peas, anything that was in the field"*. On the other hand, and because it involves second-hand clothes, it was associated with poverty: *"Before it was thought that second-hand clothes were for poor people and for people that had to go to the Plaza España to buy".* It was also associated with contamination as defined by Baxter et al., (Baxter et al., 2017). Used clothes are also connected to the idea of being 'hippie', which in turn is linked to drug use and illegal activities. Thus, participating in initiatives that promote the consumption of used clothes has a social stigma. Catulli (2016) found similar concerns among users of product-service systems, another example of circular offerings that entail the use of second-hand products, in his case, cars.

Organizers tried to counteract this image in different ways. For example, initiative C portrayed the event as a form of responsible consumption and community building. As one of the organizers put it *"We believe that swapping is a family and community tradition to which we have to return to value it and adopt it".* They argued that swapping not only reduces environmental impacts but also helps to build social capital and create connections. Initiative B offered

information explaining the specific impacts of clothes production on the environment during the events in the form of small workshops, documentaries, and in-site exhibitions. By doing this, the organizations aimed at challenging associations people make to the consumption of used products.

Practice as performance: interactions between elements and individuals

In this sub-section, we describe how the elements of swapping interact with each other during the performance, as well as the relationship between practitioners and how this specific practice, swapping, relates to other practices such as a charity.

Interlinkages between elements

The elements of a practice interact, and as a result, the practice emerges, transforms, and perpetuates as indicated by Shove et al. (2012). Figure 11 illustrates the linkages between the elements of the swapping practice analyzed here. Between each element, we identified dual interaction. The first interaction happened between the material elements such as the place and the garments and the meanings of the practice. Organizers chose the space where the event happened and adjusted it, so it evoked ideas of sophistication and 'coolness' to counterbalance the negative meanings associated with second-hand clothes (primitive, poverty and contamination). As one of the organizers put it: *"the idea is to overcome the cultural barrier or belief that swapping is something 'hippie' and something primitive and instead communicate the idea that it aims at salvaging traditional economic practices. That is why I try to find places that are cool, beautiful, that have different meanings."*

Additionally, organizers favored high-quality clothes from recognized brands, as they seem to be regarded better by participants. As an interviewee pointed out, recognized brands help people improve their decisions: *"to be honest when I go to the swapping event, I pay attention to the brand […] it is an issue of trust. Brands provide support; people know how a specific brand fits them".* The second link is connecting meaning to materials resulted in interventions such as signs in the swapping space communicating the environmental impacts of clothes consumption.
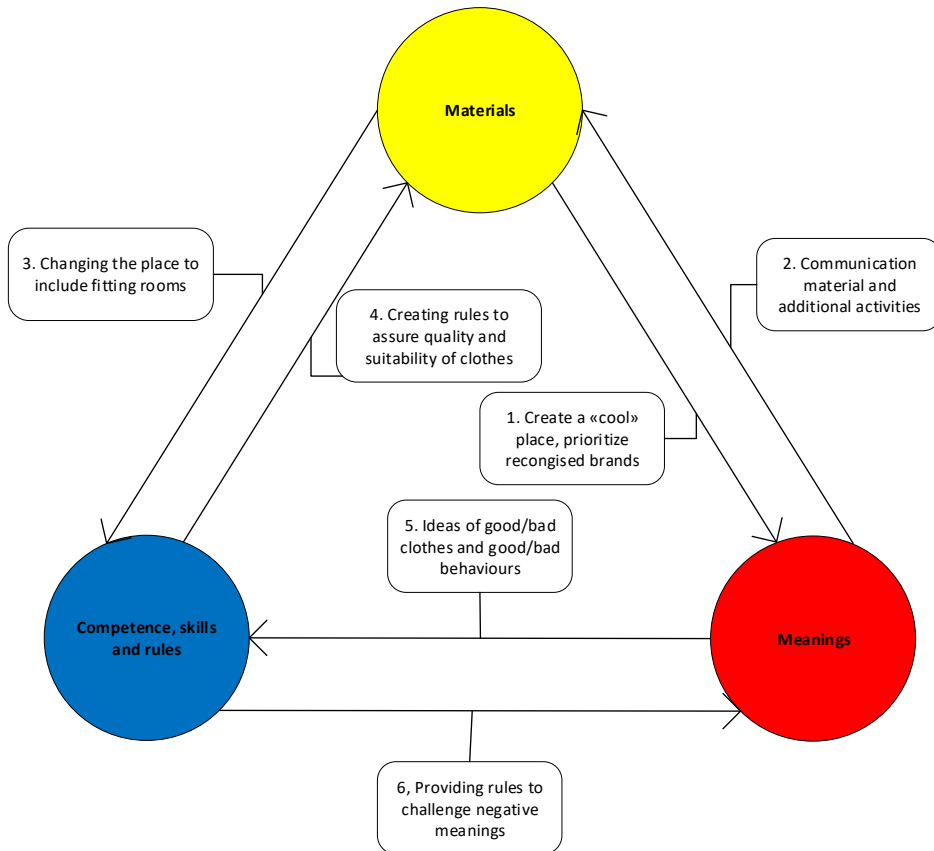
Figure 11 Interlinkages between the elements of swapping

A third link connected materials to skills and competence. To allow participants to assess better the garments they want to take, organizers set fitting rooms to allow people to try the clothes before deciding to take them. By having people filtering participant contributions, organizers also assisted in the decision of which clothes to exchange. Regarding the clothes as an instrument to facilitate participation, none of the initiatives implemented direct interventions such us mending or upcycling. We speculate it was because of a lack of knowledge and capabilities.

The fourth link connected competence to materials. Some organizers established specific and explicit rules to guarantee that the clothes available in the event were suitable for exchange. Some participants thought this was positive*: "It seemed to me like a very good idea, the fact that the methodology*

and rules were clear". In other cases, these rules were not evident from the beginning and were communicated on-site, which caused inconveniences to some participants. At the same time, these guidelines and rules were intended to challenge images of contamination and poverty. One initiative set specific guidelines for partners participating in the activity. These rules specified the type of products they could offer (local food, crafts) and banned single-use plastics. By regulating materials, organizers not only aimed at combating negative meanings but also meant to reinforce positive images of sustainable consumption and solidarity. This exemplifies the fourth link, connecting competence and meanings.

The fifth link between meanings and competence manifested in that participants chose what they brought to the events based on their own perception of what would be desirable. They also chose in terms of how frequently they used their garments. As one participant put it, she *"[…] if it is clothes, [she chooses] clothes that I do not wear any more or that my family does not use and clothes that I know other people will like and wear. Secondly, [clothes] that are in good shape.*" Because of negative meanings associated with second-hand regarding hygiene, some participants washed the items they got from the event at home, although others reported that the garments they got did not need to be cleaned. In other cases, because participants attended the event to find garments for themselves, but others, they delivered them to a secondary consumer, used the materials or resold the clothes. These different purposes were connected to the skills and competence of the participants. Finally, the sixth link from meanings to materials refers to the efforts some organizers did to offer awareness-raising sessions such as workshops, presentations, and documentary screenings that reinforced positive meanings associated to the event in terms of community building (initiative C) and environmental impacts (initiative A and B).

These interlinkages aimed at integrating new meanings associated with the materials involved in the practice and expelling negative ones. To do so, organizers evoked familiar images associated with clothes shopping by adapting the space in which the practice took place. They also developed specific rules to secure acceptable garments and prioritized certain types of clothes. They coupled the exchange event with activities that reinforced positive meanings and highlighted the need for new acquisition practices. By integrating such elements and expelling undesired ones, practitioners (organizers, partners, and participants) aimed at transforming a clothes acquisition practice from a linear to a circular form, specifically by slowing the material flow.

Interactions between individuals

As pointed out by Røpke (2009) and Watson (2016), another aspect that is important when exploring practices is the interactions between individuals. Although some practices can be performed by one person, in the present case, different actors intervened in the swap- organizers, participants, and partners. As explained before, initiatives A and B were organized by individuals while initiative C was created by organizations. Partners were usually other organizations owning the place where the event happened or other providers. Participants were mostly individuals, although we found two people that used the swapping event to fulfill their business/organization needs. One participant used the event organized by initiative C to find items for vulnerable populations. In the case of initiative B, a participant used it to find merchandise for her e-commerce business. This resulted in people benefiting from the swap, although they did not participate directly in the event. Moreover, all three initiatives offered the option for direct participants to donate the clothes that did not make the quality filter. Thus, local charities received items that were deemed not suitable for exchange in the swap by the organizers.

These actors interacted during the events and afterward. One interplay happened between organizers and partners who coordinate the activity; they had to negotiate the aim of the event, the logistics, the rules, the messages and expectations to be raised. As illustrated by one organizer, "*what we have tried is to look for groups and other people that are aligned with what we promote, because there might be people that do not agree because this [initiative] is voluntary and not for profit.*" Organizers also interact with participants. They decided what clothes were worthy of being exchanged. Moreover, because they are the ones setting up the display, they act as the temporary owners of the clothes. As a result, organizers have some advantages over participants regarding the clothes. In one case, the advantage organizers had was problematic. As one of the organizers of initiative C explained: *"we have encountered [that] people responsible for receiving the clothes began to put away items they liked, to make sure they could keep them because they were not allowed to participate in the swap. The same happened with volunteers organizing the clothes."* The organizer further explained that they addressed such unethical behavior in an internal meeting and made it explicit that it was unacceptable. Finally, participants interacted among them by negotiating who would get a garment in case two or more wanted it. A question that arises here but that was not addressed in the research is how socioeconomic issues can affect such interaction. Considering the rules established by the organizers to filter clothes (quality, brand), this can discriminate against people with lower

socioeconomic status who do not own clothes from recognized brands and do not have a surplus of garments. The organizers of initiative C identified two groups using their event *"the [people] that are aware that their wardrobes […] have things they do not use, and others may need and people that really need to swap because they do not have the money".* This question is vital if circular solutions are expected to be socially sustainable.

These observations provide the raw material for investigating power issues, as suggested by Watson (2016). First, different actors have different levels of influence on others regarding the outcomes of the practice. Organizers have more influence than participants, as they are the ones who decide what is worth circulating. This was illustrated by the example of corruption when the organizers secretly kept the best garments for themselves. Moreover, organizers also decide what is suitable for external stakeholders such as charities. According to the rules defined by the organizers in the three initiatives, charities and vulnerable communities got the clothes that were not suitable for exchange, i.e. that participants would not want.

Similarly to Schor et al. (2016) findings, such rules could deepen the socioeconomic divide within these communities, something that seems contrary to the principles of collaborative consumption. Finally, participants also influence such stakeholders, i.e., vulnerable populations and customers, when deciding what to take for them. In contrast with the position of the organizers, participants seemed to prioritize their "customers" over their interests.

Recruitment and defection

The third aspect that influences the dynamics of a practice is its capacity to recruit practitioners. According to the literature, it depends on how frequently people are exposed to the practice, the social context and the person's history regarding practice and how easy it is for the new practice to fit people's everyday lives or the interactions of the practice with other practices (Huber, 2017).

Exposure to the practice

To assess exposure to the practice in this context, we considered the frequency of the event and the different dissemination strategies. Regarding frequency, only one of the initiatives happens regularly, weekly, the other two were more sporadic and framed as one-time events, limiting their potential to recruit people. However, interviewees indicated that they tried to attend every event. Regarding communication, most of the initiatives used social media, e.g.,

Facebook and Instagram, for dissemination purposes. In one case, local actors working in media were involved and used their channels to invite people to join the event. Partners also used their networks to disseminate the invitation to participate through word of mouth: *"Well, I heard about it through—my parents told me, I was doing a master and my parents told me about [initiative C]."*

Socioeconomic context and personal histories

Regarding social context (inequalities), all the initiatives were set in urban centers, two of them in a megacity and the other one is a rather small town. Nonetheless, the 'small' city has a socioeconomic background as it was the entry point to the oil production area in the country. As such, it attracted many foreign workers and income was high. Some interviewees reported that such a setting influenced perceptions about clothing in general and second-hand clothing. They indicated that society was rather materialistic, valuing newness and ownership over more social and spiritual values. Thus, second-hand clothing and initiatives promoting sustainable consumption were regarded as a sign of low status and strange. Nonetheless, such type of city has also attracted people from bigger cities that are interested in such issues, allowing for the appearance of supporting niches.

Besides social context, Huber (2017) also suggested personal histories with the practice as an aspect that contributes to embodiment/recruitment. Participants mentioned several instances when they somehow interacted with swapping. For example, swapping was a form of traditional exchange by indigenous communities, and some interviewees reported this as their history with the practices. Other participants had experienced or heard about swapping in more contemporary settings. The first group seemed less open to the idea of swapping as they associated with less developed societies. The second group perceived swapping as a novelty. This example supports the idea that different histories can influence recruitment potential.

Interaction with other practices

Finally, how the practice fits into a person's everyday life was also suggested by Huber to influence the ability of the practice to recruit practitioners. Although the acquisition of clothing is not as frequent as other types of activities, organizers and practitioners have coupled it with other practices that allowed them to integrate it better as leisure activities. For example, and in order to attract more people, one of the initiatives portrayed the event as a form of family leisure. To achieve this, they organized their events on Saturdays or Sundays, typical days for families to do something together. Additionally, they combined the swapping

event with cultural activities, such as music, poetry and dancing to make the swap something more festive.

Besides leisure, participants indicated that the event was perceived as an opportunity to socialize, specifically for the two cases where it was not regularly organized. Because of the setting of the event, participants reported that they used the event to spend time with family members like partners and children. One participant reported that they did have to plan to take part in the event as they live in a different city. Moreover, two of the three initiatives combined swapping with donation and charity work. In some cases, the organizers promoted this coupling, but in others, the swapping practitioners too used swapping to acquire items for donation to causes of their choice. In contrast to this, an interviewee indicated that she used the swap to find products for her online store, thus bringing together swapping and entrepreneurship.

Based on the information gathered, clothes swapping in this specific socio-economic context could have a limited but expanding potential for recruitment. On the one hand, people are not frequently exposed to clothes swapping, first because it happens intermittently, second, because it is not present in mass media, and thirdly, it seldom appears in other channels providing information. Consequently, people are not aware of its existence and the opportunities it offers, limiting the recruitment potential of swapping. Regarding social context and histories, clothes swapping seems to be accepted by people with different social conditions, but because of their history with the concept, its potential to recruit could also be limited. Several interviewees indicated that they were aware of swapping as a 'primitive' exchange, which conveyed a meaning of ancient times as opposed to 'modern' times. Therefore, people might see swapping as a step backward compared to shopping.

Moreover, because swapping is linked to earlier times, it involves meanings of poverty and scarcity, preventing the practice from recruiting more participants. Nonetheless, and as explained by one interviewee, wealthy people have also participated in the swapping event as they see it as something novel and refreshing, particularly in the small city. From this perspective, swapping could recruit people if negative meanings are reconfigured and new ones are involved. Finally, the ability of clothes swapping to connect with other practices as illustrated above, can improve its potential for recruiting.

5.3 Topic 3: What aspects should be considered in design tools for the circular economy?

These findings were adapted from (Camacho-Otero, Selvefors, & Boks, 2019) *published as part of this thesis.*

Study 6 investigated how consumption and consumer issues were considered and integrated into a selected group of circular design tools. These tools were analyzed regarding circular behaviors, consumer acceptance factors and conditions for adoption. This study used the answers to research questions 1 and 2 as orientating elements for developing the tool for analyzing the data. Answers from research question 1 informed the first part of the analysis while answers to research question 2 informed the second part.

5.3.1 Circular behaviors

As summarized in Table 15 Business as Usual -BAU- is the tool that considers most behaviors while CLab does not consider any, which may be due to its focus on customer needs and contexts. Circular Economy Toolkit -CET and Circular Pathfinder -CPF acknowledge the need to consider consumer behaviors because they are part of the offering but do only explicitly include a few behaviors. Rent and rebuy are the most frequently mentioned behaviors, while remunerate, retain and renounce are absent from the tools. Other behaviors such as to receive, ritualize, regard, revalue, resell and relinquish are mentioned only once.

Table 15 Consumer behaviors considered in each tool

Consumption stage	Behavior	CDG	CLab	CET	BAU	CPF
Acquisition	*Re-buy*	-	-	Re-buy	Re-buy	Re-buy
	Rent	Rent	-	Rent	Rent	Rent
	Receive	-	-	-	Receive	-
Appropriation	*Remunerate*	-	-	-	-	-
	Ritualize	-	-	-	Ritualize	-
	Retain	-	-	-	-	-
Appreciation	*Regard*	-	-	-	Regard	-
	Repair	-	-	Repair	Repair	-

Devaluation	*Revalue*	-	-	-	-	Revalue
Divestment	*Renounce*	-	-	-	-	-
Disposition	*Re-sell*	-	-	-	Re-sell	-
	Relinquish	-	-	-	Relinquish	-
	Return	-	-	Return	Return	-

5.3.2 Acceptance factors and conditions for adoption

Table 16 summarizes which of the key acceptance factors the analyzed tools, address. Notably, only two tools do include references to aspects that may influence people's intention to engage with the solution. These factors include functionality and quality of the offering, the experience with the service, benefits for well-being, emotions and values. Circular Design Guide -CDG focuses on addressing emotion, a psychosocial factor, through marketing strategies. It also suggests emphasizing the symbolic value of the offering so cultural aspects such as identity and status can also be addressed. CPF considered aesthetic aspects of the product and trust.

Table 16 Factors of acceptance considered by the tool

Name	CDG	CLab	CET	BAU	CPF
Personal characteristics	-	-	-	-	-
Offering	-	-	-	-	Function, quality
Knowledge and understanding	-	-	-	-	-
Experience and social aspects	Experience	-	-	-	-
Risks and uncertainty	-	-	-	-	Trust
Benefits	Wellbeing	-	-	-	-
Psychological factors	Emotions, values	-	-	-	Values

The findings also show that only a few tools address conditions for adoption, and when they do, it is only tangentially. For example, CDG suggests that companies need to think of their context, which is expressed as the social conditions of their environment and their employees to contribute to a regenerative system. CDG guidance focuses on exploring options to increase the value for employees to work with the company and for local communities

where the company operates. It does not refer to the social practice in which the product or service is embedded. CLab indicates the need to understand the relevant contexts in which the offering can resolve the problem but does not provide further detail on how to do it. The rest of the tools do not analyze the context of the solution.

Circular consumer behaviors are the topic that most of the tools addressed. The minimal consideration of acceptance factors and contextual conditions in the tools is slightly surprising, as most of them advocate a human-centered approach to product and service design.

6. Discussion

This chapter presents an evaluation of the main findings regarding the research questions, of the main contributions in terms of the research challenges identified in the state of the art, and a reflection in terms of validity.

6.1 Evaluation of the contributions regarding the research questions

RQ1: To what extent do circular value propositions change the consumption process?

As the circular economy challenges the way production and consumption traditionally have been conducted, this thesis set out to explore how innovative value propositions based on circularity influenced the consumption process. Dominant economic theories have conceptualized the act of consuming as the economic activity of acquiring products or services. Subsequent stages or moments are not considered when thinking about consumption as an economic activity. Scholars from fields such as sociology and anthropology have suggested that consumption is not only about acquiring products or services but also about appropriation and appreciation (Warde, 2005). Nevertheless, and in the context of sustainability, consumption is also about why such products leave consumers and how are they disposed of (Evans, 2018). Thus, the consumption process in the circular economy is not concerned just with how people acquire products and use them, but also the processes by which they grow unattached and dispose of them (or keep them in drawers).

Much of the work exploring consumption in the context of the circular economy and circular offerings that were reviewed for this doctoral research project focused on investigating what characterizes it. Fewer insights were found regarding how such features translate into new consumer actions. Understanding what circular value propositions may require from users/consumers in terms of actions can support the design and development process by improving its foundations. This thesis investigated three examples of use-oriented product-service systems, a form of access-based consumption, to empirically explore to what extent the consumption process of such an innovative proposition, did become more complex. Based on the findings from

study 3, it is possible to suggest that the consumption process in the context of use-oriented PSS changes as it requires consumers to perform more activities. It does so due to two reasons. First, because the value proposition has at least two components, a product and a service, consumers need to perform activities to get value (economic, functional, symbolic) from these two components. By subscribing to the service, people become involved in a long-term relationship with the provider. Such a relationship requires the provision of information, following instructions and rules, meeting deadlines and providing feedback.

Regarding the product, people must be more careful than if the product was theirs, as there is a risk of becoming financially liable. Second, because of the nature of the service, people must perform additional activities regarding the product; for example, they have to return it. Based on the existing business models, the consumer needs to return the product in pre-designated boxes or bags. If they misplace them, they must pay extra fees. Thus, consumers become part of the provider's value chain which could eventually make participation in such value propositions more complicated from the perspective of the consumer and prevent their involvement. Because the consumption process of use-oriented PSS appears to become more complex, companies may have more opportunities to improve the user's experience. Moreover, at the same time, there might be more opportunities to fail. Thus, use-oriented PSS offerings may appear riskier for both the consumer and the provider.

These findings are relevant for the specific value proposition analyzed, i.e., use-oriented PSS, a form of access-based consumption. Other types of circular offerings that instead of challenging ownership, are based on commercializing circulated products that may not face similar challenges. Moreover, these results could be also related to the product category selected, i.e., clothes. Finally, geographical location, i.e., industrialized economies, may also have influenced the type of activities required from consumers and the types of value they get from the offering. These aspects were not addressed in this thesis. Future research could compare the consumption process of different circular value propositions to provide insights into what new actions are required from consumers and what new opportunities for companies emerge regarding user and consumer experience.

RQ2: What factors and conditions enable or hinder the acceptance and adoption of circular value propositions?

Concerning this question, this thesis worked with two theoretical perspectives to investigate the transition from consuming linear to circular value propositions.

One focusing on the individual as the main driver, and another one arguing that change is the result of social practice transformations. These perspectives tow perspectives have been widely used in the field of sustainable consumption to address similar questions. The perspective focusing on the individual mainly explores the question of why people may have a positive attitude towards a specific solution. The other approach is considered in this thesis as dealing with the conditions that enable actual engagement and participation in a solution. This thesis answered this research question by conducting three studies. Studies 2 and 5 used an individual approach, and they explored what factors influenced the individual's acceptance of use-oriented PSS for two product types, clothes and toys, in two different socioeconomic contexts, industrialized and emerging economies. In Study 2 exploring consumer acceptance of digital use-oriented PSS for clothing in an industrialized context, the most frequently mentioned factors were those associated to the offering (product quality, customer service), the convenience of the service in terms of its impacts on daily life (required, avoided and new activities), and personal traits such as desire for change (experimentation). Sustainability concerns were not mentioned in the data, which does not necessarily point to a lack of interest from the consumers, but rather to the nature of the data.

Study 5 offered a detailed description of factors relevant for users of and existing toy subscription service (use-oriented PSS) in an emerging economy such as India. Aspects related to the product were investigated, such as the type, quality, price, and involvement. Regarding product type, the parents reported using the service to access development and learning toys, primarily, which are more expensive and are used for a fixed period. Product quality and price were assessed as adequate by the respondents, and from their answers, it was possible to conclude that they had high product involvement. Previous findings have suggested that consumers with high product involvement may not be willing to participate in this type of offerings.

This study also provided insights into aspects of the service that were relevant for users. Financial benefits from using the service were the most frequently mentioned, followed by environmental. Social benefits were the least mentioned, signaling high anonymity, i.e., because of the digital nature of the solution, and parents did not have to meet other parents. Therefore, the parents did not meet other participants. Other aspects were less relevant such as knowledge about the service. Respondents could be characterized as not being materialistic, manifesting low need for control and low desire for uniqueness and a positive disposition towards sharing. These studies complement previous

research about acceptance factors for access-based consumption models by providing insights based on the experience of actual users.

Study 4 used a social practice perspective to explore how circular value propositions can become part of a consumption practice. Study 4 explored such a question by focusing on swapping, a practice to extend product value. By analyzing three different initiatives promoting swapping using concepts from social practice theory, this study suggested that for a new practice to emerge its elements need reconfiguration, e.g., new images and meanings such as sustainability and solidarity need to replace old ones associated to the practice, such as poverty and traditional forms of exchange. The Interactions between the elements and the individuals that take part in the practice mediate such reconfiguration. By implementing different activities and strategies, individuals transformed the linkages between the different elements, enabling them to engage in the practice.

Additionally, adoption also requires opportunities for embodiment, as suggested by Huber (2017). Opportunities for embodiment materialize through exposure to the practice, the socio-economic histories of individuals and the practice connection to other practices. The study showed that the reconfiguration attempts also had unintended results, such as reproducing negative meanings and could result in undesired behavior. Using a social practice perspective allowed for the exploration of complex relationships among elements of the practice and participants as well as other practices. This study contributed to the existing literature on circular economy and adoption by providing empirical data on the interaction between practitioners, which has not been at the heart of other empirical studies (Watson, 2016).

RQ3: What aspects should be considered in design tools for the circular economy?

This research question was addressed by developing a conceptual framework based on the insights gained in studies 1 to 5 and by analyzing existing design tools branded as circular in terms of such a framework. Based on the analysis, the study suggested that a consumption perspective considering consumption moments and behaviors, consumer acceptance factors and enabling conditions for adoption has not been considered thoroughly in the tools analyzed despite their scope on business models. The study focused on three aspects that are part of the literature on design for sustainability, as illustrated in chapter 3.3: consumer moments and behaviors, acceptance factors and enabling conditions

for adoption. These three elements provide an opportunity for improving future design tools at the business model level:

1. Consumer behaviors: circularity is not only about the recirculation of materials which could be controlled by companies. It is also about the recirculation of products, which depends to some extent on consumers and their behavior. Thus, circular design tools should consider how to enable circular behaviors. The literature on this topic from the field of Design for Sustainable Behavior is extensive and can provide relevant insights. Nevertheless, it is based mostly on a restricted understanding of the consumption process. This study suggests that a six-moment consumption process which expands the use phase can provide a better framework to understand what actions are required from the consumer perspective, to circulate products.

2. Consumer acceptance factors: in order to get consumers to develop a positive attitude towards a circular solution, several factors need to be considered at the individual level. Different tools from the field of Design for Sustainable Behavior focused on behavior change can support this process. As our findings show, in support of previous studies, aspects related to the offering, knowledge, understanding, experience and social aspects, risks and uncertainty, benefits, personal characteristics and psychological factors are all relevant in the design process.

3. Enabling conditions: although the context (aspects that configure the social practice in which the given solution is going to be used) is considered in the tools analyzed, they do not provide detailed guidance on how to explore such aspects. This thesis suggests that a social practice perspective can help guide what aspects could be analyzed. By analyzing the elements that comprise the practice that serves as context to the circular value proposition, designers could identify opportunities for different types of interventions. By considering the interactions between individuals, designers could also find leverage points for such interventions. As discussed in chapter 3.3.2, some efforts exist to translate this approach into design tools that could assist designers aiming at integrating the consumption context into their circular design tools. This thesis contributes to the literature by providing a new area for its application.

Table 17 presents a summary of the contributions to each of the research questions from the different studies.

Table 17 Research questions, contributions, publications and topics

Research Question	Contributions	Papers	Focus
RQ1	Study 1 provided a comprehensive and analytical overview of current scientific knowledge on consumption and consumer issues in the context of the circular economy and circular offerings literature.	P1, CP1, CP6	Consumption process, use-oriented PSS, fashion sector
	Study 3 offered an empirically based understanding of how circularity affects the consumption process for use-oriented Product-Service Systems in the fashion sector. Based on these findings, the study provides support to an expanded understanding of intermediate consumption moments and provides details on the action's consumers perform when engaging with such type of circular offering.		
RQ2	Study 1 provided a comprehensive and analytical overview of current scientific knowledge on consumption and consumer issues in the context of the circular economy and circular offerings literature.	P1, P2, P3, CP1, CP2, CP3, CP4	Consumer acceptance factors, adoption conditions, fashion sector, toys, emerging economies
	Studies 2 and 5 delivered an empirically based description of consumer acceptance factors for use-oriented Product-Service Systems for toys and clothes based on data from real users.		
	Study 2 presented an assessment of a novel data source, user-generated		

	online reviews, to explore consumption issues in the context of digitally based businesses and initiatives.		
	Study 5 contributed with data and analysis of cases from emerging economies that are underrepresented in the existing scientific literature.		
	Study 4 provided an empirically based account of the elements that intervene in the formation of a circular practice and practitioners' recruitment. It also contributed data and analysis of cases from emerging economies that are underrepresented in the existing scientific literature.		
RQ3	Study 6 offered a conceptual proposal for exploring how circular design tools could integrate a consumption perspective. It also provided a critical evaluation of some tools developed to achieve circularity, bringing attention to the need to considering consumption aspects when developing design tools.	CP5	Circular design tools, consumption and consumer perspectives

6.2 Evaluation of contributions regarding research challenges

As introduced in chapter 2, existing work on consumption in the specific context of the circular economy and circular value propositions, faced at least six main challenges:

1. **Challenge 1:** The absence of a systematic overview of recent contributions to the topic of consumption and consumers in the context of the circular economy and circular solutions. Advancing collective understanding of such topics requires critical knowledge of what has been done before within such fields. Hence, the lack of thorough literature reviews on consumption in the circular economy posed a significant challenge for achieving cumulative research.

2. **Challenge 2:** Understanding the implications of circularity for consumption has focused on consumer perceptions, consumption characteristics, and change pathways. Less attention has been paid to the actions that consumers perform in the context of such offerings.

3. **Challenge 3:** Despite the span of contributions on factors influencing consumers when confronted to circular offerings, most of them have focused on understanding intention rather than the behavior, using intention as a predictor of behavior minimizes the role of the values-action gap that establishes that even when people have the intention to act in a certain way, they often do not because of contextual factors. Thus, research focusing on consumers who have already engaged in the desired behavior is needed.

4. **Challenge 4:** Due to the lack of real-life examples, most research addressing consumption drivers have used offering and business models concepts rather than working with functioning businesses, which have been highlighted by researchers as a significant limitation. Working with scenarios can provide essential insights but at the same time, limits the replicability of the findings to real-life situations. However, recent technological developments have enabled companies to implement concepts such as the ones investigated in previous research, opening the opportunity to investigate similar questions in a more natural setting.

5. **Challenge 5:** Most research reviewed was conducted in industrialized countries, and only a few articles address questions about consumption and circular economy in emerging economies. Provided the cultural, socio-economic and historical differences between these two sets of countries, the findings of consumers in industrial economies may not be transferrable to other socioeconomic contexts. Emerging economies' resource consumption and waste generation are increasing at a high rate which is unsustainable and needs to change. Hence, more knowledge from these contexts is needed.

6. **Challenge 6:** Although knowledge about perceptions of circular offerings, their characteristics from a consumer perspective, what would drive people to engage in such solutions is expanding, there is a shortage of work on how such insights translate into design processes.

This thesis' contributions address these challenges differently:

1. **Contribution 1** addresses challenge one by offering a critical overview of existing research on the circular economy, circular offerings that

explore consumption and consumer issues. It mapped the main questions asked, the answers provided and the areas for future work. Additionally, it discussed the theoretical and methodological approaches used so far, their advantages and shortcomings. Nevertheless, and because this area of research is increasingly gaining attention from researchers, this overview is limited and should be permanently updated to keep track of new insights provided by new research. This contribution provided the general conceptual framework for the rest of the studies and subsequent contributions.

2. **Contribution 2** addresses two challenges from the literature, challenge 2 connected to the understanding of how circularity affects consumption regarding actions, and challenge 5 about the integration of user perspectives in the design of circular offerings. Current research has focused mainly on perceptions and understandings of consumption as well as changes in consumption patterns. Less attention has been given to the specific actions that consumers need to engage with when participating in circular offerings. This doctoral research used an extended conceptualization of the consumption process and provided empirical foundations to this definition by mapping the new actions consumers perform in the context of a circular offering. Additionally, and based on these findings, this dissertation suggests actions that could be considered in circular design tools by developing offerings that integrate the user perspective.

3. **Contribution 3,** namely, the use of data from real users and novel data sources such as user-generated online reviews, addresses challenge 4, the shortage of studies based on real-life cases. This dissertation collected data from consumers of existing offerings only. By doing this, it provided empirical evidence to evaluate previous findings and extend the available knowledge.

4. **Contribution 4** refers to the use of novel data sources to investigate consumption issues in the context of circular offerings such as user-generated online reviews. This contribution also addresses challenge 4 by assessing the suitability of using such novel consumer data sources. For the case studies included in this dissertation, user-generated online reviews were evaluated positively as a useful source of data. However, our findings show that they should be used in combination with other sources such as interviews that provide insights regarding more personal aspects of users as suggested by Daae & Boks (2015).

5. **Contribution 5** addresses challenge 4 about the need for more studies investigating consumption issues in emerging economies. By researching with consumers from India and Colombia, the dissertation offers insights into the aspects that influence consumers coming from these specific socio-economic contexts.

6. **Contribution 6** responds to the challenge 3, namely, the need for more work investigating the processes by which consumers effectively engage and participate in circular offerings, beyond intention. By using a social practice perspective, this research explored contextual factors that enable circular offerings to emerge and recruit participants. It also explored how these practices unfold and influence consumers.

7. **Contribution 7**, a conceptual framework suggesting elements to be considered in circular design tools, extends existing knowledge on the user perspective in design and developing processes for specific circular offerings. It does so by suggesting a series of elements that should be part of existing tools in order to achieve such purpose based on the findings of studies 2-5.

6.3   Reflections on the validity of the findings

As introduced in chapter 4, validity in qualitative research is based on the trustworthiness of the study, or to what extent the researcher's interpretation of the data reflects the problem studied. The literature on validity in the context of qualitative research suggests the following main aspects, as guidance for evaluating it:

1. Credibility: grounding explanations in descriptions and clearly reflecting the context and experience of participants

2. Authenticity: recognition of different voices and awareness of the inquirer's influence

3. Criticality: a reflection about the hypothesis, use of contrasting examples

4. Integrity: awareness about potential biases and analysis grounded in the data rather than the researcher's values

In the following paragraphs, I discuss the different studies in terms of these four aspects as part of this doctoral research project. I do not list how each study addresses each aspect but instead offers an overview of how the methods and data sources contribute to what the literature defines as credibility, authenticity, criticality and integrity.

Findings from studies 2 and 3 are based on the analysis of verbatim contributions from the participants. Nevertheless, and even though user-generated online reviews have been deemed suitable for consumer research, they have some limitations for providing an in-depth understanding of people's experiences and perceptions. First, because of its objective, consumers focus on giving input that they deem useful for other users and potential customers. This may result in a filtered opinion about their own experience. Additionally, and because of the setting for providing feedback, consumer reviews may not invite users to provide detailed accounts of their experience.

Nevertheless, the data from the user-generated online reviews did offer an overview of what factors and conditions were more critical for actual users of fashion subscription services. It also offered a level of detail regarding specific aspects such as impacts on daily life that could not have been reached by using traditional data collection tools. Finally, and although the case studies were all based in the U.S., the online reviews used to come from a variety of locations within the country, which could be difficult to achieve if traditional data sources had been used.

Study 4 was based on in-depth interviews with participants in a circular consumption practice in specific contexts. By using this method, it was possible to ask follow-up questions to gain deeper insights into the participants' experience with the practice. By continuously analyzing the empirical data against the theoretical framework, it was possible to develop rich analysis to address the research questions. Nevertheless, and although interviews provided a significant amount of information, it is crucial to use observation techniques. Such methods can provide further insight into the interlinkages between different practice elements and actual performances, and the reasons for recruitment or defection.

Study 5 used an online questionnaire with open and closed questions addressing the different aspects influencing consumer acceptance, according to the literature. It included additional questions about the specific situation and characteristics of the participants. The study was based exclusively on the results of the questionnaire. Nevertheless, the questionnaire did not allow for detailed information about the specific context in which each participant used the service. Such insight can be acquired through in-depth interviews. Finally, study 6 was conducted using publicly available reports on the different tools and based on the informed assessment conducted by the researchers. This study only provides a preliminary understanding of the tools analyzed. Future work requires conducting joint evaluations with designers and practitioners who can

provide deeper insights into how to integrate the suggested consumption aspects into the tools and the usefulness of the resulting tool.

All studies were designed to include different types of participants and consider their divergent perspectives. In studies 2 and 3, both positive and negative reviews were included, to be able to integrate opposing perspectives. However, given the limitations in time and resources, only three companies were included, which is a small number of working businesses.

Study 4 was based on the information from not only participants but organizers and partners all coming together in the practice. The study aimed at acquiring different perspectives by listening to all these voices. By doing this, it was possible to gain an unexpected understanding of power dynamics within the performance of the practice, as well as the unusual purposes of such performance. Because the recruitment of research participants was done through purposeful sampling, the people interviewed may not be representative of the population participating in the events. However, and because of the methodological approach of this study, the aim is not to generalize but rather acquire meaningful insights regarding participants' perceptions and practices.

Study 5 recruited users from different backgrounds, locations, and situations in India as the general characteristics of respondents reflect (age, education and income information). By doing so, the study considered the perspectives of different types of users that enriched the understanding of factors of acceptance. Study 6 considered tools from both academia and industry, with different goals and scales of application. This provided us with a broader perspective regarding scope. Summarizing, the design for each of the studies aimed at complying with these aspects in order to provide a rich understanding of the concepts investigated. Nevertheless, as it is illustrated, the choices made resulted in some limitations that should be addressed in future research.

6.4   Future research

As discussed in chapter 6.3, this thesis has a few limitations that provide opportunities for future research. First, it focused on two types of circular offerings, use-oriented PSS and swapping. However, there are several other offerings and business models that will require different consumption process, challenging acceptance, and adoption. For example, results-oriented PSS, peer-to-peer sharing activities, consignment stores, and future businesses that aim at reducing consumption of new products.

Additionally, this thesis draws its empirical basis from two product categories, toys and clothes. Although both have inherent circular challenges, additional categories should be explored, especially new product categories that require high amounts of resources or damaging materials, i.e., wearables such as personal electronics or smart clothing, and plastic-based consumer products. Finding ways to enable circulation for such resource-intense products is urgent.

From a methodological perspective, although the thesis makes essential contributions by using novel data sources for qualitative research, future research could explore a mixed-methods approach to evaluate the impact of changing consumption patterns towards circularity. Moreover, new studies about consumer acceptance could combine user-generated online reviews and other digitally based data sources with more traditional methods. Comparative studies between emerging and industrialized economies could help draw similarities and differences in why consumers accept or not specific examples of circular business models. They could also contribute to understanding how consumption practices emerge in different contexts. Finally, a consumption-oriented design tool integrating previous knowledge from the fields of Design for Sustainable Behavior and Practice-Oriented Design to be applied in the specific context of the circular economy could contribute to the expanding area of research on Circular Design.

Some of the findings presented in this thesis contributed to an empirically based understanding of power dynamics within the implementation of a circular consumption practice, swapping. By investigating the interactions between practitioners, it was possible to identify unbalanced relationships and unintended results that seemed to deepen unequal relationships between direct and indirect participants. Questions about the socio-political consequences (i.e., power relations, inequality, inequity) of the circular economy from a consumption perspective can offer stimulating research opportunities. The

literature addressing such topics is embryonic as argued by Hobson & Lynch (2016).

The circular economy offers significant opportunities to address some sustainability challenges regarding resource use. As suggested by researchers, such potential will only be realized if both the production and consumption sides of the economy undergo significant transformations. Discussion about the circular economy by governments and business consultancies has mostly focused on the production side, how to develop business models, improve value chains and production processes. However, the transition will not happen if the market does not adopt circular products and value propositions developed. In sum, this thesis aimed at contributing to the understanding of consumption in the circular economy by investigating the changes circularity brings for consumption, the consumption aspects influencing acceptance and adoption, and by exploring how to integrate those elements into new design tools.

7. Concluding remarks

By providing a consumption perspective on the circular economy, this thesis aims at helping circular economy advocates from different areas such as government, businesses and civil society broaden their approach and realize the promise of a systemic change. The circular economy is presented to address some of the most pressing environmental challenges of today, resource efficiency and climate change. Nevertheless, most of the existing proposals from governments and businesses focus primarily on technological transformations, and on providing information to consumers, in the hope that they will be rational and follow companies. However, and as work on sustainable consumption has shown, these technological transformations should be coupled with social transformations. This thesis aims at building a bridge between the field of consumption and the emerging area of the circular economy that can help different actors in their work promoting the latter.

Based on the findings from this thesis, a set of recommendations for different stakeholders working on the circular economy are provided:

1. **Researchers and policymakers:** these two groups have a critical role in promoting the transition to a circular economy. Hence, they are the primary target audiences for this thesis. Researchers working on the circular economy mostly come from areas such as engineering and businesses and are more interested in supply-side issues such as technology, processes and supply chain. This thesis contributes to their work by offering a consumption perspective that could be integrated into the research questions they pose and the modeling strategies they use for analyzing the circular economy. For example, when assessing the environmental impacts of different circular strategies, researchers could nuance their adoption assumptions by using the circular consumption actions and acceptance factors suggested in this thesis. Policymakers aiming at enabling circularity could explore interventions that aim at reconfiguring social practice elements towards circularity in addition to business transformation programs, information and design guidelines and standards.

2. **Designers and consultants:** this thesis provide input for design practitioners and consultants interested in supporting the transition to a circular economy. It provides a detailed understanding of the implications

circular value propositions such as access-based consumption models have on the consumption process. It also offers a two-perspective approach to changing consumption patterns that can help design practitioners and consultants develop tools for creating innovative value propositions in the context of the circular economy. Ultimately, it provides them with a conceptual framework to guide their creative process when assisting customers in devising potential sustainable innovations.

3. **Design educators:** this thesis argues for the integration of a consumption perspective when creating interventions that close and slow material loops. The design field has advanced in this task by incorporating the user and practice perspectives in the field of Design for Sustainability. This thesis can support design education focusing on services for a circular economy as it offers insights into how consumption changes in this context, what elements may be relevant from a consumer perspective, and what mechanisms may influence the adoption of solutions designed. This thesis can provide insights for design educators about intervention opportunities.

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Appendix A: Appended papers

◉ NTNU

DECLARATION OF CO-AUTHORSHIP

JUANA CAMACHO-OTERO apply for the evaluation of the following thesis:

Redrawing the circle: integrating a consumption perspective into the circular economy

*)The declaration should describe the work process and division of labor, **specifically identifying the candidate's contribution**, as well as give consent to the article being included in the thesis.

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*)
Declaration of co-authorship on the following article:

Camacho-Otero, J., Boks, C., Pettersen, I.N., 2019. **User acceptance and adoption of circular offerings in the fashion sector: insights from user-generated online reviews**. Journal of Cleaner Production. https://doi.org/10.1016/j.jclepro.2019.05.162

Camacho-Otero, Boks and Pettersen contributed to the conception of the study. Camacho Otero designed the study, conducted data collection, analysis and interpretation, drafted the first version of the article. Boks and Pettersen provided critical revision of the article, specifically feedback on the analysis, and interpretation.

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Camacho-Otero, J., Boks, C., Pettersen, I.N., 2018. **Consumption in the circular economy: A literature review.** Sustainability. 10. https://doi.org/10.3390/su10082758

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Camacho-Otero, J., Selvefors, A., Boks, C., 2019. **Circular design tools: (how) do they understand the consumer?** in: Product Lifetimes and The Environment. Berlin.

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Camacho-Otero, J., Boks, C., Pettersen, I. N., 2018. **Changing the game: consumer perceptions and factors of acceptance for circular solutions in the toy sector**. In: Proceedings of the 23rd International Sustainable Development Research Society Conference. Messina.

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PAPER 1

Purpose: This study aimed at providing a critical perspective on the different studies available. Following the criteria provided by Boote and Beile (2005) to conduct a satisfactory literature review, this review's objectives were to identify the gaps in the literature that need to be filled and to assess the practical and scholarly significance of the contributions.

Method: This study was based on a systematic literature review of 111 papers, following three stages, planning, conducting and reporting. The literature review provided an overview of current perspectives on consumption in the literature about the circular economy, remanufacturing, product-service systems, the sharing economy and collaborative consumption.

Results: Results from this study include a critical summary of a set of literature on the circular economy and specific circular offerings considering consumption issues; an analysis of existing research challenges in the literature reviewed, and research opportunities on the topic of consumption in the specific context of the circular economy.

Contributions: This study makes the following contributions. The identification of main questions addressed by extant literature on the circular economy and specific circular value propositions, a systematic description of factors driving consumption of specific value propositions, and areas for future research on the topic of circular consumption.

MDPI

Article

Consumption in the Circular Economy: A Literature Review

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Abstract: A circular economy (CE) aims at decoupling value creation from waste generation and resource use by radically transforming production and consumption systems. Recent reviews on the topic of the circular economy have indicated that cultural barriers are a significant factor hindering the diffusion of so-called 'circular' business models, particularly the lack of consumer—or user—acceptance. However, none of them has provided an overview of the existing literature addressing such issues that can help academics and practitioners better understand consumption considerations when addressing the circular economy. Motivated by these observations, this paper presents the results of a literature review that summarises and discusses insights from 111 articles in terms of the problem area, theoretical approaches, methods, and tools that have been used to collect and analyse data, the main issues, and identified research gaps. The results show that most of the existing scientific work on the circular economy and circular solutions addressing consumption has focussed on identifying factors that drive or hinder the consumption of circular solutions. A smaller but expanding set of articles has focussed on offering insights into the nature, meaning, and dynamics of consumption in the context of the circular economy. According to this set of articles, consumption in the circular economy is anonymous, connected, political, uncertain, and based on multiple values, not only utility. A smaller set of papers has explored the integration of user and consumer perspectives into design processes. Although these contributions are relevant, opportunities for further research are still open, particularly regarding socio-material and cultural aspects of consumption in the context of the circular economy, and the role of digitalisation. In addition, more work could be done regarding strategies to foster not only acceptance but also the adoption and diffusion of the circular economy. Based on the findings of this literature review, some ideas for a research agenda on the issue of consumption in the circular economy are outlined.

Keywords: literature review; sustainable consumption; circular economy; product service systems; sharing economy; collaborative consumption; remanufacturing

1. Introduction

A circular economy (CE) aims at decoupling value creation from waste generation and resource use [1] by radically transforming production and consumption systems [2]. Most of the literature on the circular economy seems to focus on the production side, exploring circular business models [3], strategies to develop circular value propositions [4], and the benefits of such models [5]. Less attention seems to have been paid to how consumption and consumers would affect or be affected by the circular economy [2]. As suggested by Hobson et al. [6] the circular economy might translate into significant changes in people's everyday lives, but there seems to be little understanding of such alterations in the scientific literature, and the policies promoting the circular economy [7]. Among such changes are the

need to give up the requirement for ownership and newness, and to engage in behaviours such as repairing and returning goods.

Due to such changes, consumption issues, particularly consumer and user acceptance, have been highlighted as a significant factor hindering the diffusion of 'so-called' circular business models. In a recent report, Kirchherr et al. [8] found that the lack of consumer interest and awareness is a "main impediment regarding a transition towards CE" (p. 7) after surveying businesses in Europe. Earlier, Rizos et al. [9] reported the same complaint from small and medium enterprises trying to move towards circular business models and solutions. They indicated that the "lack of support from demand networks" prevented the implementation of green innovations such as circular business models.

Despite the realisation that the circular economy translates into significant changes in consumption, recent reviews on the circular economy do not provide comprehensive accounts of such issues. For example, Kirchherr et al. [2] found that only 19% of the papers defining the circular economy considered consumption, and highlighted that not enough is known about why consumers would participate in the circular economy or not. Van Eijk's [10] review focussed on drivers and barriers to the circular economy, and although it included consumption and business/consumer acceptance as one of its thematic areas, the insights offered were rather general. Geissdoerfer et al. [11] investigated the relationship between the circular economy and sustainability, but did not make any significant reference regarding the consumer or consumption aspects. Finally, Ghisellini et al. [12] found that the existing literature on circular economy considers consumers to be passive and rational recipients that will follow labels and other production-side signals when making decisions.

Motivated by these observations, this paper aims at filling this gap by providing a review of the literature on the circular economy and specific circular solutions that address issues of consumption and consumer acceptance. To do so, it analyses articles in terms of research questions, theoretical approaches, methods, and tools used to collect and to analyse data, main issues addressed, and main research gaps identified in the studies. Based on the results, it suggests areas for further exploration on the topic of consumption and consumer acceptance in the circular economy to tackle concerns about the lack of understanding of such issues in the literature. The paper has five sections. After the introduction, Section 2 provides an overview of the circular economy, specific circular solutions, and consumption research in the context of sustainable development. Section 3 describes the method for performing this review. Section 4 presents a summary and discussion of the main findings. Section 5 discusses the main findings of the review. The final section presents the conclusions.

2. Background

Although the concept of the circular economy is widely used by academics and practitioners, there is little agreement regarding what it means. One of the most used definitions was coined by the Ellen Macarthur Foundation and is represented in the now-famous 'butterfly diagram' [1]. In this visualisation, the circular economy is divided into two cycles, a biological cycle and a technical cycle, both of which are comprised of actors and activities. At the centre of the diagram is the consumer for the biological cycle and the user for the technical cycle. Other stakeholders involved in this definition are the service provider, the product manufacturer, and the parts manufacturer. This diagram is accompanied by three principles that the foundation coined as the circular economy principles. First, the preservation and enhancement of natural capital, second, the longer circulation of products and materials in both cycles, and third, designing out waste.

More recently, Kirchherr et al. [2] offered a definition based on a systematic analysis of a significant number of publications in the scientific and grey literature that dealt with the circular economy. They suggested that a circular economy "is an economic system that replaces the "end-of-life" concept with reducing, alternatively reusing, recycling, and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks), and macro level (city, region, nation, and beyond), with the aim of accomplishing sustainable development, thus simultaneously creating environmental quality, economic prosperity

and social equity, to the benefit of current and future generations. It is enabled by novel business models and responsible consumers." (p. 229).

This last definition aimed at solving most of the shortcomings of the existing attempts to explain a circular economy. According to the authors, it provides a sense of hierarchy among the different activities that are part of this approach, prioritising reduction and reusing over recycling and recovering as expressed by Europe's waste hierarchy. It makes explicit the multi-scale character of economic systems as well as the need to contribute to sustainable development rather than just resource efficiency bringing a triple-bottom perspective. Finally, it highlights the role of companies and consumers as enablers. Although this definition still has some shortcomings, such as for example, ignoring the role of other actors besides companies and consumers, or limiting the role of citizens to consumers or users as pointed out by Hobson and Lynch [6], it is deemed operational for the purpose of this review.

2.1. Circular Economy and Circular Solutions

Following Kirchherr et al., in a circular economy, materials and products should be reused, recycled, and recovered instead of discarded, if not reduced. Companies aiming at becoming circular should offer solutions based on such activities. In order to decide what solutions could be considered circular, we turned to the literature on circular business models. In 2014, Accenture [13] suggested five types of circular business models: circular supplies, resource recovery, product life extension, sharing platforms, and product as service. Later, Bocken et al. [14] suggested the access performance model, extending product value, classic long life, encouraging sufficiency, extending resource value, and industrial symbiosis as circular business model strategies. In a more systematic fashion, Lewandoski [4] presented over 25 different business models corresponding to the ReSOLVE (regenerate, share, optimise, loop, virtualise, and exchange) framework by the Ellen MacArthur Foundation [15]. Despite these efforts, clear definitions of circular business models and circular value propositions are still lacking

Drawing on these findings, this review focusses on the literature addressing three types of solutions, remanufactured products, product service systems (PSSs), the sharing economy, and collaborative consumption (these last two are counted as one). Remanufactured products are the result of a reuse process that repairs, replaces, or restores components of a product that is not useful anymore and aims at ensuring "operation comparable to a similar new product" [16]. A PSS is "a market proposition that extends the traditional functionality of a product by incorporating additional services. Here, the emphasis is on the 'sale of use' rather than the 'sale of product'"[17] (p. 1543). Such a model enables the reuse of products by intensifying use. There are three types of PSS: product-oriented, results-oriented, and outcome-oriented [18], but only one could offer significant sustainability results according to Tukker and Tischner [19]. With an outcome-oriented PSS, the company has the incentive to reduce costs, including materials, thus creating the opportunity for increased efficiency and improving sustainability. In contrast to that, the two first groups still depend on the physical product to deliver value; therefore, the potential for material efficiency might not be as considerable. Companies have implemented PSSs as a strategy to commercialise remanufactured products and intensify the use of goods, thus making it a strategy for reuse, a key activity within the circular economy.

Finally, the sharing economy and collaborative consumption are both forms of consumption that aim at intensifying the use of otherwise underutilised assets, facilitating the reuse of products as in the case of PSSs [20]. According to the European Commission, the sharing economy refers to "companies that deploy accessibility-based business models for peer-to-peer markets and its user communities" [21] (p. 3). Schor [22] suggested four types of activities that are considered sharing: the recirculation of goods, an intensification of use of durable goods, an exchange of services, and the sharing of productive assets. Collaborative consumption as defined by Ertz [23] considers activities that involve consumers as both providers and "obtainers" of resources. It can be based on access and ownership transfer, either online or offline. In practice, sharing economy

solutions and collaborative consumption solutions aim at facilitating access to underused assets via marketplaces, platforms, or networks. They are not restricted to community initiatives; there are also companies that have developed solutions based on such premises. According to Accenture, technological developments have facilitated the proliferation of the sharing economy and collaborative consumption-based solutions, as they have allowed organisations and peers to access broader markets and populations [13]. However, and although their potential to contribute to sustainability has been an argument to promote them, there is no conclusive evidence that such a promise has been fulfilled; on the contrary, there appear to be indications that so-called sharing companies are increasing the demand for resources [22,24,25].

2.2. Sustainable Consumption Research

Since the circular economy should aim at achieving sustainable development as suggested by Kirchherr et al. [2], consumption in the context of the circular economy can be considered a form of sustainable consumption. Sustainable consumption as a field of research investigates the relationship between consumption and sustainable development, and the roles that consumers and other stakeholders play in that relationship [26]. It was born from a political concern about the environmental impacts of consumption patterns in affluent societies, as illustrated by Cohen [27]. This interest translated into a set of questions that have been at the core of the field, including what the consequences of consumption activities on the environment are, what the drivers of such forms of consumption are, what actions could reduce such impacts, and how to drive change [26]. Researchers from this field have investigated the environmental impacts of consumption [28] and the drivers of such forms of consumption including international trade [29] and societal conventions [30]. They have tried to conceptualise what makes consumption sustainable [27], and also offered insights about elements that can drive change, such as nudging [31], eco-labelling [32], marketing [33] and practice-oriented interventions [34].

To address the questions about what motivates consumer behaviour and how to foster sustainable consumption, researchers in this field have used different theoretical frameworks. In an early review, Jackson [35] offered a comprehensive account of models that had been used to understand consumer behaviour and change. He suggested four groups; one encompassed rational choice models such as rational choice theory, consumer preferences theory and Lancaster's model, all based on economic theory, the second one included the theory of reasoned action, the theory of planned behaviour, the means–end chain theory, and the simple expectancy–value theory. A third group referred to the theories offering a more cultural approach to understanding consumption, including consumer culture theories. The last group referred to models using a socio-material approach focussing on practices rather than behaviours.

The models in the first group, the rational choice theory group, suggested that people make decisions based on calculations regarding the costs and benefits of a given decision, such as purchasing a product or entering a marriage agreement. The option selected would be the one that maximises utility or minimises costs given different restrictions (income or tastes). Such an approach is based on the assumption that agents are perfectly rational, and that they have immense calculating abilities. It also assumes that individuals do not have morals or emotions, and therefore rely only on self-interest. All of these assumptions have resulted in strong criticism from different fields over the years.

The second set of models were considered by Jackson as an extension of rational choice theories and aimed at addressing previous criticism while keeping the assumption that decision making is based on a specific goal, an expected outcome, or reward. They detailed the factors that influence the intention of an individual regarding a particular behaviour. Such factors initially included attitudes, values, beliefs, and the individual's sense of their own capability to perform the behaviour. Later versions incorporated norms and habitual behaviour, and also considered situational factors and their influence in activating different norms (for a detailed discussion about the different models, see References [36,37]). Some of the criticism to this perspective as presented by Jackson and other

authors such as Sanne [38] referred to their reliance on the cognitive abilities of individuals even though emotional and moral aspects had been found to also be important, and the assumption that attitudes affect intention and behaviour, and not the other way around. In addition to these, Jackson also mentioned that critics highlighted the exogenous role given to social structures as another problematic assumption.

The third group of theories referenced in Jackson's review and in Halkier et al. [39] (a more recent overview of consumer research) focussed on the "dynamics of consumer actions, the marketplace, and cultural meanings" [40] (p. 868), and is more interested in consumers' lifestyles and identities. According to Jackson, such a set of models aimed at exploring the individual in her social context with the aim of understanding how consumption mediated such a relationship and how material goods help in the process of identity creation, because goods carry meanings. Consumer culture theories, which are part of this group, investigate the "consumption of market-made commodities and desire-inducing marketing symbols" [40] (p. 869) as vehicles of meaning. They are concerned with the entire consumption cycle, from acquisition to the possession and disposition of goods, and provide insights on the symbolism of consumption and its role in processes of identity creation and differentiation. Examples of research using this approach in the field of sustainable consumption include investigations into the meaning of anti-consumption [41], green consumerism, [42] or voluntary simplicity [43].

Transitioning from the theories that see individual consumption as embedded in social contexts, the fourth set of models emerged exploring consumption using practices as unit of analysis. Practices, as defined by Schatzki [44], are the "embodied, materially mediated arrays of human activity centrally organised around shared practical understandings"(p.11). According to Jackson, following Giddens, practices are "influenced on the one hand by social norms [and] lifestyle choices, and on the other by [the] institutions and structures of society" [35] (p. x). Examples of practices include food wasting [45] or laundering [46]. This approach aims at bridging approaches rooted in the individual and social structures by offering a middle point [47]. It also aims at bringing back ordinary consumption to the centre of attention after the consumer culture tradition relegated it to the side [48]. The application of practice theories in the field of sustainable consumption has gained traction in the last decades. Researchers such as Welch and Warde [49] offered an overview and presented two examples of how this has been done to illustrate the flexibility of the approach. They also argued that practice theories fit the research agenda of sustainable consumption, because besides considering acquisition as part of consumption, they also investigate subsequent phases such as use in the context of everyday life. In addition to this, they argue, practice theories also help address the "attitude–behaviour" gap, which is one of the main problems with psychological accounts of consumption.

3. Materials and Methods

In order to conduct the literature review, we followed the three steps suggested by Tranfield et al. [50] to perform systematic literature reviews. Stage I, the planning of the review, involved the definition of the key terms to be used for identifying relevant studies. Stage II, conducting the review, included the identification of relevant studies, as well as extraction and analysis of data. Finally, stage III, reporting and disseminating, involved the organisation and elaboration of this article. In this section, we describe each of these stages.

3.1. Stage I: Planning of the Review

Step 1. Definition of Keywords. During this stage, we defined a set of keywords and strings following the purpose and scope of this review, and the relevant literature on circular economy and consumption. Based on the discussions in Sections 2.1 and 2.2, we chose the search keywords and strings presented in Figure 1.

Figure 1. Search terms for web query.

3.2. Stage II: Conducting the Review

Step 2. Selection of Articles. Based on these search terms, we first identified existing relevant studies using Web of Science and Scopus. We only considered peer-reviewed journal articles published until February 2018. In order to guarantee the quality of the inputs, a minimum of five citations per paper was required for articles published before 2015, whereas papers published from 2015 onwards were included irrespective of their number of citations. A total of 1182 papers was identified.

To limit the publications for the review process, abstracts were screened using relevant keywords ("consumer" OR "user behaviour" OR "consumer and user acceptance" OR "adoption" OR "perceptions" OR "attitudes" OR "intentions" OR "willingness to pay"), which resulted in 178 papers addressing these issues. We are aware of the individualised theoretical orientation of these keywords, and tried to overcome such bias by complementing the literature using a snowballing approach.

After manual inspection, a significant number of these papers were excluded because they did not directly address issues of consumption or consumers. Instead, they dealt with other issues such as optimisation modelling, operations analysis, and environmental assessment. This resulted in a list of 95 papers. This group was complemented using a back and forth snowballing process, searching for articles that either used the selected studies as references or were referenced by them, mirroring the methodology used in Tukker [51]. The final list of articles to be reviewed included 111 publications.

Step 3. Data Extraction. Articles were organised in a spreadsheet. For each of the 111 papers, we identified general characteristics such as year of publication, geographical focus, and product category. Geographical focus shows where the empirical data were collected when this was available. Finally, product category or function included the type of product or practice, e.g., mobility, accommodation, heating, that was being analysed. Papers analysing different types of products or offerings were classified as multiple. Conceptual papers did not have a product or practice focus.

Each paper was then analysed in terms of five key dimensions as illustrated in Table 1. Each article was coded with Nvivo11 using the predefined categories: "definitions", "questions", "discipline", "methods", and "future research".

Step 4. Data Analysis. For each dimension, topics were identified following a double cycle coding technique, as defined by Saldaña [52]. During the first cycle, a descriptive coding strategy was used to understand the main issues the authors discussed, and in the second cycle, a pattern coding strategy was applied to similar group codes and identify categories.

Table 1. Dimensions for analysing existing literature on consumption and circular solutions.

Dimension	Description
Problem Addressed	The issue the study explores, the research questions posed by the article.
Theoretical Frameworks	The disciplines and theories used in the study to analyse the data collected.
Methods and Tools	Methodological approaches and tools used by the researchers to collect the data.
Issues	The answers the studies get to their research questions, including the list of factors explaining user and consumer acceptance, the nature, meaning, and dynamics of consumption, as well as the description of how design processes included consumption consideration
Research Gaps	The aspects that researchers suggest need further investigation.

3.3. Stage III: Reporting and Disseminating

Step 5. Organise Findings. The results of the review are presented in terms of the general features of the papers and the five dimensions selected and described in Table 1. For each dimension, the main themes are suggested based on the interpretative analysis of the content of the papers. The outline for a research agenda is based primarily on the future research suggested by the literature.

4. Results

4.1. General Characteristics

Most of the studies reviewed focussed on specific solutions such as the sharing economy and collaborative consumption (40%), PSS (24%), and remanufactured products (25%). Research addressing consumption in the context of the circular economy is scarce (10%). Although research focussing on consumers and specific solutions that contribute to closing material loops started in the mid-1990s, it has been on the rise ever since. At first, regarding consumption, researchers seem to have only worked with PSS, but remanufacturing and the sharing economy started to catch their attention after 2010. Studies investigating consumption in the specific context of the circular economy appeared for the first time in 2015.

In terms of geography, most of the studies were conducted in high-income countries in North America and Europe, with only a few located in countries classified as middle income such as China, India, Malaysia, and Brazil. Consumers from regions such as Latin America and Africa have not been included in existing studies, and Eastern European consumers are also underrepresented in the literature. Most of the studies explored the topic of the consumer acceptance of specific types of products or functions, with the majority of papers analysing several product categories and types of functions simultaneously. Consumer electronics and car sharing are the most popular categories among researchers, and both categories have been described as having the most potential for circularity. Accommodation and co-housing services follow these, with clothing as the third most popular product category to be used as a case study. Food, buildings, baby products, automotive parts, heating, waste collection, and packaging are included under the category "Others".

4.1.1. Problem Addressed

The first dimension of our analysis is the problem area addressed by the circular economy and consumption literature, i.e., what questions researchers have focussed on. Based on our analysis, we found several themes of interest; these are presented in Table 2. Four major themes were identified: consumption drivers, consumption nature, meanings and dynamics, and user perspectives in design processes, including conceptual contributions.

Table 2. Main themes regarding the problem addressed in the publications.

Category	Theme	Description	Number of Papers	Examples
Consumption drivers	Factors (barriers, drivers, motivators)	Under this theme, we grouped articles that explored the antecedents of consumer acceptance as well as the barriers that prevent consumers from adopting the circular solutions included in this review.	72	[16,53–120]
	Consumer perceptions	Without specifically identifying antecedents or factors for acceptance, these papers focussed on consumers' attitudes towards circular solutions.	7	[121–127]
	Consumer typology	Under this theme, we classified articles that aimed at providing profiles or typologies of consumers in relation to the characteristics of circular solutions.	2	[128,129]
	Incentives for acceptance	This group includes studies that looked into external strategies that could help improve the acceptance and adoption of circular solutions.	2	[130,131]
Consumption nature, meanings, and dynamics	Consumption dynamics	This theme refers to the papers that aimed at explaining how the process of consumption changes in the context of circular solutions.	9	[132–140]
	Nature of consumption	These articles reflected on what makes the consumption of circular solutions different from the consumption of other types of offerings.	6	[7,24,141–144]
	Meaning of consumption	This theme groups papers that explored how consumers understood consumption in the context of specific circular offerings.	7	[145–149]
User perspectives in the design process	Design process	These papers investigated how the consumer or user was integrated into the design process of specific circular solutions.	6	[150–155]
	Theoretical inquiries	These papers provided frameworks to introduce the consumer perspective in the design process of circular offerings based on previous findings.	2	[156,157]

Most of the articles investigated the drivers of consumption of circular solutions. This included factors driving or hindering acceptance, consumer perceptions, consumer types and strategies, or incentives to improve acceptance. Authors approached this question from a variety of perspectives. For example, Armstrong et al. [124,125] investigated the reasons for the limited diffusion of particular solutions associated with positive or negative perceptions. Other questions addressed the level of public awareness of specific solutions [127], the role of specific features in forming such perceptions [126], consumer preferences [121], and how consumers construe the solution [122]. Besides perceptions, some of the literature has also tried to provide consumer typologies that have different answers to circular solutions [128,129], and the incentives to push for acceptance and adoption [130,131]. These contributions focussed mostly on solutions such as the sharing economy, remanufacturing, and PSS.

The other three themes have received considerably less attention. Of these, most of the articles addressed the nature, meanings, and dynamics of consumption. Studies offered new ways of understanding specific solutions [141]; they inquired about how everyday life would exist in a circular future [142], and what aspects defined consumption in this particular context [143,144]. Only two papers questioned the socio-political consequences of the circular economy and inquired about equity in this context [7,24]. The papers investigating meaning in the context of circular solutions, and explored notions of specific circular solutions [158], ideas, societal codes [149], shared and individual meanings, and understandings of the different solutions offered [148].

Papers have explored how the user has been included in the design of specific circular solutions, and discussed how user research was implemented, such as for instance during the development of a mobility solution based on PSS [150]. A similar approach was used with a housing development by Dewberry et al. [151]. More recently, studies on the design process of circular solutions focussed on how specific elements such as emotion were included in a PSS design in the health sector [154]. Such studies have also questioned how user-centred design was used to develop a sharing solution [152], or how design research infrastructures that integrate users can inform solutions development [153]. Gruen [155] explored how the design process can influence consumer decisions to participate in a circular solution. Finally, only two papers have focussed on summarising previous findings to make theoretical contributions regarding factors and motivators for acceptance, and how to include these in design processes [156,157].

4.1.2. Theoretical Frameworks

Half of the articles reviewed chose a theoretical approach coming from the fields of psychology or economics (50%). As Table 3 illustrates, within this group, the most popular theoretical framework is the theory of planned behaviour (TPB) developed by Ajzen [159], which suggests that intention is a good predictor of behaviour. It depended on three main components: attitudes, subjective norms and perceived behavioural control. According to this model, if interventions successfully address these elements, they will influence intention, and very likely affect behaviour. Although a few articles used the original version of the TPB, other studies included other approaches to overcome some of the criticism levelled at it.

Table 3. Theoretical approaches used in the publications.

Categories	Theories	No.	%	Examples	Articles
	Theory of planned behaviour (TPB) and related theories	31	28%	TPB, extended TPB (combinations with norm activation theory, social practice theory, activity theory) and theory of reasoned action	[16,58,62,63,65–70,74,76,80,83,85, 86,89,93,94,97,101,103,105,111, 112,120,123–125,127,160]
Utilitarian approaches	Other psychological theories	7	6%	Theory of psychological ownership, personal construct psychology	[75,122,154,161]
	Economic theories	18	16%	Risk theories, institutional economics, rational choice, prospect theories, Enkel-Kollat-Blackwell (EKB) model	[56,59,61,64,71,72,77–79,88,90,99, 104,118,126,138,158]
Consumer culture approaches	Consumer culture	12	11%	Consumer culture theory (CCT), burdens of ownership, relational marketing	[55,57,87,91,114,140,141,143–146, 149]
Institutional, socio-technical and socio-material theories	Practice theory	7	6%	Social practice theory, actor network theory	[132,134,136,137,142,148,153,155]
	Socio technical studies	4	4%	Diffusion of innovations, innovation studies	[121,134,135,162]
	Design theories	3	3%	User-centred design	[53,150,152]
Other theoretical approaches	Other theories	11	10%	Chaos and complexity theories, experiential learning, push-pull-mooring theory, Means-ends chain analysis	[60,95,106,129,139]

Such extensions include the norm activation theory that expands on what elements influence intention and behaviour in the context of moral situations [36] and activity theory, which explores how consequences in everyday life can affect the perception of a new offering [74]. Besides TPB, other psychological theories used to explain acceptance include personal construct psychology [122] and the theory of psychological ownership [161]. From economics, authors such as Kahneman and Tversky [163], have used theoretical approaches such as prospect theory decision-making theories under risk and uncertainty conditions, and institutional economics.

The second approach to consumer research comprises frameworks that look into the topic from a cultural perspective, focussing on the experience of consumption and its meaning for individuals, using consumer culture theory [40]. Only 11% of all the articles used theories that consider these aspects. Besides the specific framework of consumer culture theory, other authors explored the role of brand personality and involvement [91], semiotics [149], experiential learning, and grounded theory [57]. These theoretical approaches have been used mainly by authors working with PSS, remanufacturing, and the sharing economy, although not extensively. Studies that are more recent have not explored the topic using this stance.

An additional perspective used when studying consumption was grounded in more systemic theoretical approaches coming from institutional, socio-material, and socio-technical traditions. For example, Petersen and Riisberg [136] used actor network theory to describe how their phenomenon of interest, a PSS for baby clothes, evolved, and how human and non-human actors interacted to allow for adoption. Social practice theory (SPT) was used by Mylan [134] to understand how processes of appropriation influence the diffusion of PSS by investigating how the elements of a practice transform with the introduction of alternative solutions such as PSS, how the interlinkages among such elements change, as well as the links to and between other practices. Other authors used this theoretical framework as a model to understand how sharing economy solutions become normal [132]. Institutional economics were used by Mont [138] to explore the barriers to the normalisation of solutions such as PSS, and by Mohlmann [72] to identify the determinants of satisfaction regarding sharing solutions. Diffusion of innovations theory was used by Meijkamp [133], Borrello [162], and Guttentag [98] to explore the reasons why different solutions spread among consumers using the main drivers that this theory suggests. Some articles used other theoretical frameworks addressing issues such as governance [95], a sense of causality and hierarchy to the factors influencing consumers [106], complexity [110], and community [147].

4.1.3. Methods and Tools

From a methodological perspective, 46% of all of the studies used quantitative methods, 34% used qualitative methods, and 16% followed a mixed methodology. The literature using quantitative approaches focussed on sharing and collaborative consumption (19%) and remanufacturing (18%). Most of the research using qualitative methods investigated sharing and collaborative consumption (13%) and PSS (13%). Studies on the circular economy and consumption used both approaches equally. The three main data collection tools used were surveys (45%), semi-structured interviews (20%), and experiments (11%). Other data collection tools included focus groups, ethnography, and action research.

Most of the studies using a quantitative approach aimed at explaining the causality between a target variable such as willingness to pay or willingness to participate and some specific antecedents. Tools to analyse data quantitatively included structural equation modelling or regression analysis. Observation and action research have not been widely used in the literature due to the lack of real settings and logistical problems [143]. The digital transformation of businesses has also opened a new field for consumer research via the Internet, but only a few studies collected data using the Internet for answering their research questions [129,146].

4.2. Issues: Consumption Meanings, Drivers, and the User in the Design Process

As illustrated in Section 4.1.1, the literature reviewed discussed three questions. One addressed what drives the consumption of circular solutions, another explored the nature, meaning, and dynamics of consumption in the circular economy, and a third question explored how the consumer—or user—has been included in the design process of circular solutions. In this section, we present insights from the literature on these themes.

4.2.1. Factors Driving or Hindering Acceptance by Consumers

Most of the studies reviewed focussed on identifying factors that drive or prevent consumers from acquiring or participating in such solutions (see Figure 2). Such factors fall into one of seven major themes: personal characteristics, product and service offering, knowledge and understanding, experience and social aspects, risks and uncertainty, benefits, and other psychological factors.
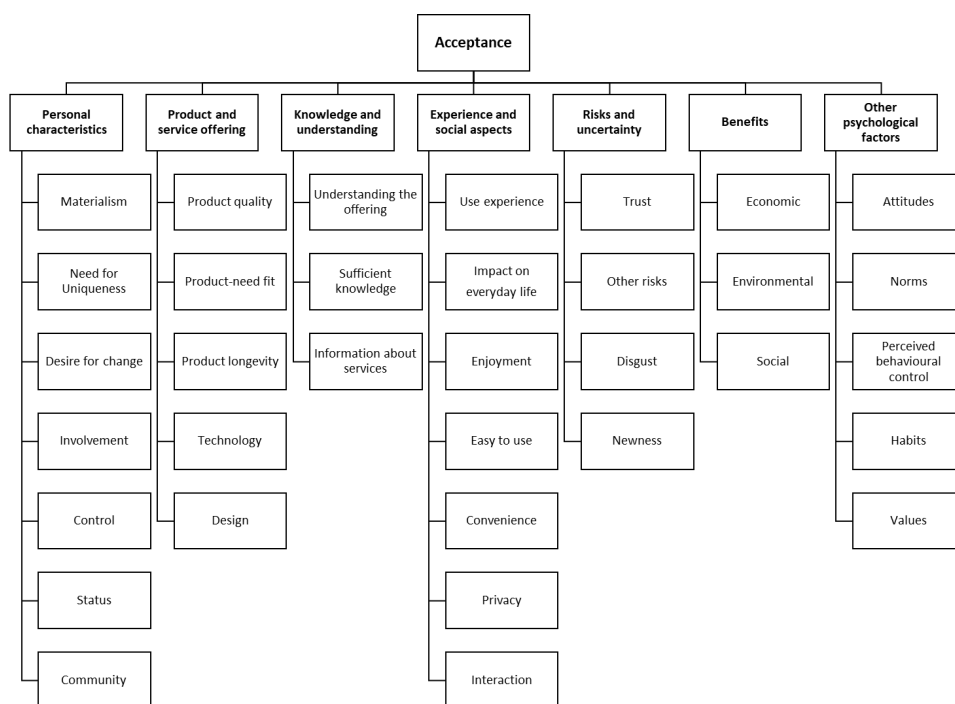

Figure 2. Main factors influencing the perception and acceptance of circular solutions, according to the literature.

Personal Characteristics

Recent research on the consumer acceptance of circular solutions has focussed primarily on aspects intrinsic to individuals. Materialism is one of the main features investigated by researchers [84,86,94,140,160]. Materialistic individuals attach high value to material possessions, and as such, it has been deemed problematic for access-based consumption. Other personal characteristics that have been explored in the literature include the need for uniqueness [93], desire for change [124], involvement [91,143,145], and the control or the ability of the consumer to effectively use the service [67,80,82,105,143,155]. Additional aspects investigated include the sense of status [55,84,107,122,138,140] and of community [72,137,147].

Product and Service Offering

Another aspect found by researchers influencing perceptions and attitudes towards circular solutions was the characteristics of the product or the service. For example, product quality [57] was one of the main reasons people gave regarding the decision to buy refurbished products over new ones. Product type and product-need fit were also relevant for consumers according to several authors [76,138,145]. Product longevity, the period of time in which a product is used before it reaches its end of life, was also relevant for consumers in their evaluation of circular solutions [82,157]. Besides the product, the technology that supports value delivery influenced perceptions and acceptance according to a study about circular solutions to reduce food waste [162]. This category also includes factors related to the design of the offering [65,83,102,124,125] and the brand [16,75,118].

Knowledge and Understanding

Researchers have considered understanding the offering, sufficient knowledge about the product [58,79,122], and information about the services as additional factors influencing the perceptions of different circular solutions. Understanding the offering refers to the ability of the consumer to assess what is needed from him or her in order to access the solution [83]. Public awareness has also been considered as an important indicator of understanding, and has been researched as an antecedent for acceptance [127]. Product knowledge refers to the information that the consumer has to assess the quality of the product and the potential benefits it would yield. It includes knowledge about the quality of the product, the environmental benefits, and the costs [79,100]. A lack of knowledge can lead to erroneous perceptions regarding the quality of remanufactured products or the hygiene of sharing schemes.

Experience and Social Aspects

This category includes aspects related to how consumers experienced the solutions and the impacts that such experiences have on their perception of the solutions [129] as well as the role of experiences in the past on such perceptions [66]. Besides experiences, it also considers the impact that such solutions have on the everyday life of the consumer [74]. The social characteristics of consumers are important when it comes to influencing their perception [68,77,97,120,160]. Emotional and affective aspects such as enjoyment and excitement are included here, as well as ease of use and convenience [54]. In addition to these, some authors also found that privacy [120] and interaction [98,100] are relevant for consumers.

Risks and Uncertainty

In this category, we included aspects such as trust, risks, disgust, and newness, as well as concerns about lack of ownership. Trust refers to the ability to be confident that the provider is offering a quality solution, and that in case of damage, they will solve any problem [54,55,72,97,126]. It also refers to trust in other customers, as some of the solutions require interaction between customers [95,120,130]. Quality risk includes problems regarding performance [78,87] as well as safety due to contamination [16,82,100]. Such interactions are connected with the concept of newness or lack thereof that is usually associated with circulated solutions [83,84].

Benefits

Another aspect that influences the perception of circular solutions is the different types of benefits the consumer derives from the offering. On the one hand, economic benefits such as cost savings resulting from discounted prices have a positive effect on consumer acceptance according to the literature reviewed [77,84,97]. On the other hand, several authors found that environmental benefits support positive perceptions [54,60,78], and social benefits have also been mentioned by authors as aspects relevant to the consumer [77,90,120].

Other Psychological Factors

As mentioned before, most of the studies conducted in this area focussed on psychological factors such as attitudes, subjective norms, perceived behavioural control, and intention [65–67]. Authors have explored both antecedents of such factors and their relationship with behaviour or constructs such as willingness to pay or participate.

These categories are presented separately for purposes of clarity; however, they are not entirely independent. For example, personal values such as materialism can affect a consumer's perception of risk, and this in turn could depend on what role psychological factors play. They might also influence what type of knowledge and information is more important for addressing such risks. Previous experiences can also affect perceptions of risks, uncertainty, or benefits, and several of the papers explore these relationships. Although this is a relevant aspect, it is beyond the scope of this review.

Besides the factors fostering or hindering the consumption of specific solutions, some authors have explored perceptions of different forms of circular solutions such as Armstrong et al. [124,125], who investigated what aspects influenced the positive or negative perceptions of hypothetical scenarios. Matsumoto [123] compared the perceptions of remanufactured products between United States (U.S.) and Japanese consumers regarding factors such as knowledge, price, and risks, among others. Other authors focussed on types of consumer and their acceptance of circular solutions. Decrop et al. [129] for example identified three types of users of accommodation sharing services, grouped according to how transformational the experience was. Finally, Mugge et al. [131] investigated the impact of different incentives (information, product, or service-based) on consumer groups when selling remanufactured/refurbished phones.

4.2.2. The Nature, Meaning, and Dynamics of Consumption

In the circular economy, consumption will most probably change in terms of what it means for consumers, how they perceive it, and how it evolves. The literature considers several aspects as relevant when exploring the new meaning of consumption in the context of the circular economy, as presented in Table 4.

Table 4. Meanings of consumption in the circular economy.

Aspect	Description	Authors
Anonymity	In the circular economy, consumption becomes anonymous because people do not own products, they merely use them. The identity potential offered by goods dissolves; people might not be able to define themselves by the products they have anymore.	[141,143,145]
Connected consumption	New relationships between consumers and companies develop, resulting in deeper forms of engagement and involvement. The idea of community is also revant in the circular economy. Reciprocity, sociability, and interaction become key aspects that are realised through networks and sharing activities. Such settings facilitate the establishment of institutions that can enforce agreements and trigger commitment by participants. Usually, such characteristics arise from initiatives that come from the bottom–up, rather than top–down.	[132,136–139,142,143,145, 147,158,164]

Table 4. *Cont.*

Aspect	Description	Authors
Multiplicity of values	Although circularity is based on functionality, solutions cannot only rely on their utility value; they need to create symbolic value as well. Thus, consumption in the circular economy, as in the linear economy, needs to address several values at the same time. Two relevant aspects that become valuable in the circular economy are frugality and well-being. Circular solutions should also consider these aspects.	[134,137,142,144–146,149, 164]
Political consumerism	Consumers perceive circular solutions as a form of rebellion against mainstream consumption, and engaging with them is expected to reflect a certain political stance. In the past, material consumption was perceived as a sign of status; however, dematerialised consumption becomes the norm in the circular economy.	[141,143]
Uncertainty	Since in the circular economy, products only move temporarily from producers to consumers and then return to continue their journey with other consumers, issues of trust, risk, and control arise. Thus, efforts to formalise such 'liquid' relationships are fundamental to reassure both parts in the transaction. Knowledge and information are also expected to address such concerns.	[139,141,143,144,158]

Beyond the nature and meanings of consumption in the circular economy, few authors have explored the dynamics of consumption in the context of the circular economy, i.e., the conditions by which circular solutions attract participants and retain them. Briceno and Stagl [139] focussed on how circular solutions such as PSS help build a sense of community and contribute to creating social capital. Huber [132] suggested a framework for exploring the processes by which different practices change and recruit or expel practitioners using practice theory as his framework. Earlier studies investigated how different forms of ownership and modes of transportation influenced the adoption of shared mobility [133] and the role of institutions facilitating the normalisation of access-based consumption [138]. More recently, Petersen and Riiseng [136] offered an illustration of how users and providers interacted to improve the adoption of innovative circular business models. Finally, Mylan [134,135] investigated how practices' elements change, and their relationship transforms to allow for more participants to join.

4.2.3. The User Perspective in the Design Process for Circular Solutions

Only a few articles in the reviewed literature reflected on the consumer in the context of the design process of circular solutions. Dewberry et al. [151] indicated that solutions such as PSSs could not be thought of only in terms of the product, they must also consider systems of provision and how the consumer fits within such an ecosystem, as it is a product–service system. A similar suggestion was made by Knot and Luiten [150] when they analysed the process of creating a mobility-related PSS. A very important aspect highlighted by Stacey and Tether [154] was the consideration and integration of emotions and a sense of familiarity in successfully developing a circular solution in the health sector that users engage with and accept. An aspect highlighted by Knot and Luiten [150] that relates to these elements is the need to consider daily practices in the design process. Daily practices make up everyday lives, i.e., the routines that people perform in their day-to-day contexts can affect how they react to new solutions. The authors highlighted cost savings, income, and elements of efficiency as also being relevant for the consumer and user [151,152], and as important to incorporate into the

design process. Other aspects mentioned in the literature as increasing consumers' positive attitude towards circular solutions include control, knowledge, and creativity [155].

4.3. Research Gaps

The last dimension considered by this review were the gaps in the research identified by the authors. First, several authors indicated that more insights are needed regarding demographic and cultural factors and their role in affecting acceptance and adoption of circular solutions such as remanufactured products and the sharing economy [73,83,121]. This could be achieved for instance through geographical replicas of previous studies [121]. Authors also recognised the need for incorporating a gender perspective in the studies to clarify differences that might affect decisions [70,121]. Furthermore, some authors also suggested further investigating the intention–behaviour gap in the context of circular solutions by focussing on data collection on observed rather than reported behaviour [67]. Aspects related to the role of the brand in influencing behaviour were also mentioned as areas of interest for further investigation [16,75,91].

Changing perceptions of consumption was suggested as an area requiring more research, given the new notions of ownership [73,83] and new values in the context of collaborative consumption [62]. Additionally, Mylan [134] indicated that more work is needed on understanding the role of interlinkages between practices and how these affect the recruitment potential of a practice. In line with this integrative proposal, Möhlmann [72] indicated that studies should assess determinants of acceptance from a holistic perspective. Besides these, she also suggested including more sectors when investigating the sharing economy and the factors influencing acceptance. Some authors also suggested conducting more research on the type of individuals or groups that are more susceptible to accepting circular solutions [131,140], and exploring strategies to improve the acceptance of policy, design, and communication interventions [60,131].

Another proposed dimension for further research relates to methods and tools for collecting relevant data. Catulli et al. [55] suggested exploring ethnographic methods for understanding PSS better, whilst Santamaria et al. [149] indicated the need for tools to extract data from cultural codes that can be used to design circular offerings better. Finally, Dewberry et al. [151] suggested that participatory design could be important in developing PSS, given the need for more local and contextualised understandings.

5. Discussion

Based on this literature review, it was found that interest in the relationship between consumption and the circular economy is increasing. This is reflected in the growing number of studies conducted in recent years that explore the topic. However, most of such literature has focussed on specific circular solutions, rather than the general concept of the circular economy. Nonetheless, a few papers have investigated how the circular economy will affect consumers and how it will be affected by consumption, providing much-needed insights. In addition, most of the data used in the studies reviewed come from high-income economies, and only a few articles have explored consumption in the context of emerging economies. Although affluent economies are the leaders in resource consumption as highlighted by the United Nations [165], emerging economies seem to be following a similar development path, intensifying their resource use. In light of this, governments and other actors from these economies may want to leapfrog to a circular economy, demanding a better understanding of consumption aspects in this particular context.

This literature review indicated that three main questions had occupied researchers exploring consumption in the specific context of the circular economy and circular solutions. First, what factors, perceptions, typologies, and incentives drive the consumption of circular solutions. This question attempts to offer insight regarding the causes of the lack of consumer acceptance of circular solutions, which has been highlighted as an important barrier to moving towards a circular economy [51,166]. Most of the insights from this stream of literature referred to factors driving

or hindering the intention to buy or participate in such offerings. According to the authors addressing this issue, the acceptance of circular solutions depends on the personal characteristics of consumers, which include personality traits, values, and ideologies that may influence consumer perceptions. It also depends on the product and service offering, which refers to the characteristics of the solution offered by the company. The level of knowledge about and understanding of a specific offering also affects the intention to purchase it or participate in it. Moreover, the experience of using the offering, interacting with other consumers, and its impact on everyday life are also relevant. People also indicated that the risks and uncertainty associated with the circular solutions, i.e., reused products and access-based consumption, affect their perception and the intention to pay for them. The benefits of accessing the specific circular solution are also relevant when a person is deciding to participate or not. Other psychological factors such as attitudes and norms also influence such a decision, according to some of the papers reviewed here. These findings are in line with what Jackson [35] defined as the intrinsic and extrinsic factors influencing intention and behaviours.

The second question that the literature considered refers to the nature, meanings, and dynamics of consumption. Research addressing this area explored the symbolic and systemic aspects of consumption addressing the concerns about the relationship between the circular economy and consumption [8]. Findings by the studies suggest that the nature and meaning of consumption in the circular economy are characterised by five features, i.e., anonymity, connection, multiple values, political consumerism, and uncertainty. Regarding the dynamics of consumption, researchers have provided different accounts of how consumers move from a linear form of consumption to a circular one. According to studies investigating this question, practices that involve circularity were able to recruit participants due to the (re)configuration of the elements of practice, meanings, materiality, competencies, rules, and the opportunities for embodiment [132], or the linkages between elements and between practices, as suggested by Mylan [135]. Others explored how the interactions between actors (human and non-human) in a PSS resulted in different levels of adoption [136]. This set of papers is rather small compared to the contributions in the previous group, and is mostly about high-income economies. Thus, more work addressing these issues using data from middle and low-income economies could be beneficial.

The third question referred to the integration of users in the design process, and reflected on the operationalisation of a user-centred perspective in the developing process of circular solutions. The different answers to this question considered inputs from the studies in the other two groups. Some focussed on what factors should be integrated into the design process to attract consumers and users; others looked into infrastructures to facilitate understanding of complex relationships between consumers and circular solutions, and others explored how methods to integrate the consumer and the user in the design processes helped improve acceptance. By doing this, these studies exemplified how insights from different disciplines can be integrated and operationalised for developing solutions. Even fewer articles addressed this type of questions about strategies to develop solutions that are more acceptable to consumers. Considering that acceptance does not necessarily translate into adoption or diffusion, more research exploring how to develop interventions that not only are attractive to individuals but also help change trends is urgently required.

These contributions are in line with the development of research in the field of sustainable consumption. However, some areas of interest that have occupied researchers in this field seem to be missing in the literature on circular economy and circular solutions reviewed here. On the one hand, we did not find studies exploring the consequences of consumption in the circular economy on sustainability. On the other hand, only a handful of papers explored strategies to drive change and promote circular forms of consumption. The third stream of papers exploring design processes and the role of the designer could be considered as a contribution to answering this question about change. Nonetheless, change is not only about acceptance; it is also about actual adoption and diffusion, requiring research on not only products or services, but also on the system level.

Although this review aimed at being systematic, it has several shortcomings. On the one hand, it used a limited definition of circular solutions, restricting the search to three types that are based on the circulation of materials. Energy has not been considered here as a circular solution, although it has been included in some classifications of business models as energy recovery. Energy recovery operations are solutions at the 'end of the pipe', as illustrated in the butterfly diagram by the Ellen Macarthur Foundation [1]. The role of the consumer is limited to providing appropriate waste streams. Moreover, in presenting the findings of the existing literature, because of space limitations, we focussed on the factors, but not on the relationships among the factors. Although we tried to be exhaustive when selecting the papers to be reviewed, several were not included. Finally, we did not include conference papers; however, given the newness of the issue of the circular economy, they can provide important insights regarding what areas of interest are emerging.

6. Conclusions

This literature review has provided an overview and analysis of the existing literature focussing on the issue of consumption in the specific context of the circular economy. Based on its findings, it is possible to say that consumption in the context of the circular economy and circular solutions is becoming an area of increased interest for researchers. Although most of the existing contributions have been made regarding the factors driving and hindering the acceptance of circular solutions, some researchers have investigated the relationship between consumption and the circular economy by exploring the nature, meanings, and dynamics of consumption in this particular context. By doing so, these papers offered accounts of how consumers experience circular solutions and the elements and conditions that enable the recruitment and normalisation of practices that involve circularity. Less work has been done on how to trigger change both at the individual and collective levels to help the diffusion of circular solutions and the transition towards a circular economy.

Moreover, questions regarding equity and power in the circular economy are missing from the literature, as different authors have already pointed out [6,7,24,167]. Given the alterations in ownership, such topics raise interesting questions; for instance, how would the power balance between companies and consumers alter in a 100% access-based economy, or how willing would consumers be to give up privacy for the sake of comfort? What about the free labour that companies are getting by transferring assemblage or repair responsibilities to consumers? What is the role of media and other cultural actors in creating the conditions for a transition to a circular economy? These gaps, in addition to the ones highlighted in the literature, provide a picture of new avenues for research that can contribute to better understanding the conditions that facilitate the transition to a circular economy.

Finally, the digitalisation of the economy is suggested to be one of the main drivers of the circular economy, as e.g., pointed out by Accenture [13]. This opens up novel topics for consumer research, and offers new sources of data that can be used for future research. Although a few papers have used information from Internet communities, this limited practice needs to be further explored. Nonetheless, new legislation regarding the use of personal data online might create some barriers to accessing such sources.

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PAPER 2

Purpose: This study had a dual purpose. On the one hand, it explored the factors influencing acceptance of use-oriented PSS in the clothing sector by investigating fashion subscription services. On the other hand, it investigated the suitability of user-generated online reviews to explore consumption issues in the context of digitally based circular value propositions.

Methods: For this study, a literature review provided the theoretical basis regarding factors of acceptance. Empirical data came from 123 user-generated online reviews. The data was analyzed following a qualitative strategy.

Results: From the data analysis, it was found that factors under the economic and socio-material categories were reported more frequently by users as influencing their acceptance of the different fashion subscription services analyzed. Other aspects that had been suggested in previous research such as environmental values and other psychological factors were not mentioned. User-generated online reviews were deemed suitable for investigating the research question, only to a limited extent. They should be combined with other methods that can explore personal characteristics, such as values and emotions.

Contribution: This study contributes with an assessment of a novel data source, user-generated online reviews, to explore consumption issues in the context of digitally based businesses and initiatives. An empirically based evaluation of factors influencing acceptance of a specific circular value proposition in the clothing sector, for an industrialized socioeconomic context.
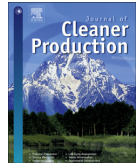
User acceptance and adoption of circular offerings in the fashion sector: Insights from user-generated online reviews

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A B S T R A C T

Recent research on circular offerings has indicated that the lack of consumer and user acceptance of circular offerings is one of the primary barriers for the transition to a circular economy. Available studies on this topic have used data from hypothetical scenarios, reducing their explanatory potential. Today, established circular businesses such as fashion subscription services open new research opportunities to address such limitation. In this context, this paper assesses the suitability of user-generated online reviews as a novel source of information for investigating factors and conditions of acceptance and adoption of circular offerings in the fashion sector. Based on the data analysis, it was found that user-generated online reviews were credible, contributed with new insights regarding factors and conditions of acceptance and allowed us to analyse a significant number of observations. The reviews provided significant insights into economic factors and the impacts this type of offering had on the daily life of users, an aspect that has been studied rarely, so far. Nevertheless, this type of data sources also presented some limitations. On the one hand, and because of their nature, they did not offer significant insights into other consumer and user acceptance factors identified in the literature such as demographic, psycho-social and cultural factors. On the other hand, they only provided a snapshot of the user experience in a given moment of time. To address these limitations, we suggest future research on user and consumer acceptance of circular offerings should investigate ways to integrate user-generated online reviews with more traditional tools and methods to gain insigths into cultural and psychosocial factors, explore additional sources that can help capture the dynamics of service use such as social media, online communities and customer service chats, and expand data collection to other market segments.

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1. Introduction

Compared to many other large industries, the fashion sector has a high potential for achieving resource efficiency (Gwozdz et al., 2017). While the production of clothes has been underscored as a major source of negative impacts, including greenhouse gases emissions, chemical pollution, water consumption, the usage phase (specifically the laundering of clothes) also causes substantial impact, due to the energy consumption and waterway pollution through microfibers leakage (Brooks et al., 2017). Regarding end-of-life, the Ellen MacArthur Foundation (2017) has estimated that 73% of the annual fibre and clothing production is incinerated globally and only 12% is recycled or cascaded into new products as a consequence of massive underutilisation of clothes in middle and high-income economies.

These challenges happen along the value chain, i.e. the design, sourcing, manufacturing, usage and disposal stages and thus, require actions in every stage (Caniato et al., 2012; Harris et al., 2016). The literature on fashion and sustainability has offered a number of strategies to overcome various sustainability challenges, including organic materials, modular design and business models based on services that contribute to the use intensification of clothes (Fletcher, 2012; Laitala, 2014a; Moreno et al., 2016; Niinimäki, 2013). This last category, services to intensify utilisation, includes offerings that contribute to closing material loops such as product service systems (PSS), sharing activities and collaborative consumption (Bocken et al., 2016; Lewandowski, 2016).

In recent years, fashion and clothing companies have

implemented such types of business models under the name of fashion subscription services which offer customers the chance to access an inventory of garments in exchange for a monthly fee (Pike, 2016). Fashion subscription services can be considered as radical innovations because they disrupt traditional forms of value creation and delivery (Vezzoli et al., 2012). However, radical innovations face multiple challenges, in particular, the lack of consumer −or user acceptance (Kirchherr et al., 2017; Rizos et al., 2016; Tukker, 2015). User acceptance has been defined as the positive intention of an individual to access a service or acquire a product (Schrader, 1999).

Although there has been some research on user acceptance of circular offerings such as PSSs, the sharing economy and collaborative consumption, there is still need for further insights (Camacho-Otero et al., 2018). Moreover, and because of a shortage of real-life examples, such studies have been mostly based on hypothetical scenarios, which constrains their explanatory potential (Qu et al., 2016). Existing fashion subscription services can be used as case studies to provide further insights into user acceptance. Such companies are usually digitally enabled, meaning that they use the Internet as their selling channel. Because of this, novel sources of data such as user-generated online reviews become available for further exploring user issues (Cui et al., 2012). Existing literature on user acceptance of circular offerings in the fashion sector has yet to explore the potential such source offers to better understand factors and conditions influencing demand. Based on these observations, this paper presents the findings of an exploratory study addressing two questions:

- Are user-generated online customer reviews suitable to provide insights regarding factors influencing user acceptance?
- What factors influence the user acceptance of digital circular offerings in the fashion/clothing sector?

The paper is structured as follows. The next section offers a background regarding circular offerings and user research in the field of sustainable consumption. In section 3, the materials and methods used for collecting and analysing the data are provided. Section 4 presents and discusses the results of the literature review on user acceptance of circular offerings, the analysis of the data about factors for acceptance, and the suitability of user-generated online reviews followed by section 5, which presents some conclusions.

2. Background

2.1. Circular offerings in the fashion sector

Circular offerings in the fashion sector aim to help users satisfy their needs while complying with circular economy principles. According to the literature, Product Service Systems (PSSs), the sharing economy and collaborative consumption are examples of circular business models (Bocken et al., 2016; Lewandowski, 2016). Mont (2002) defined PSSs as bundles of products, services and infrastructure offered by a company to their customer base in order to satisfy their needs. According to Tukker (2004), PSSs can be categorized into product, use and result oriented depending on the level of servitization. From a circular perspective, use and result-oriented PSSs have the highest potential to enable recirculation of products and materials (Tukker, 2015). Following Schor (2014) the sharing economy 'activities' fall into four categories: recirculation of goods, increased utilisation of durable assets, exchange of services and sharing of productive assets. The first category refers to marketplaces for second-hand goods; the second type refers to leasing or renting of assets like cars or houses. The third category

includes time banking initiatives or platforms connecting people to complete small tasks in exchange for money. Finally, the fourth category refers to the sharing of production spaces.

Collaborative consumption refers to activities or offerings that specifically help recirculate goods and services. It was first defined as the collection of events "in which one or more persons consume economic goods or services in the process of engaging in joint activities with one or more others" (Felson and Spaeth, 1978, p. 614). In a review about collaborative consumption definitions, Ertz et al. (2016) found that collaborative consumption often has been associated with internet-mediated interactions and access-based consumption. However, they contested both characterisations by arguing that also offline initiatives exist that help recirculation and that those activities entail the transfer of ownership via reselling or swapping.

Few studies have investigated the environmental impacts of such offerings. Iran and Schrader (2017) explored the environmental impacts of collaborative fashion consumption, which encompassed gifting, lending, sharing, swapping, renting, leasing, and second-hand use. The authors suggested that these offerings have positive environmental effects via gains in efficiency and encouraging sufficiency. These offerings may improve resource efficiency because they intensify the use of clothes and extend the life of products. Moreover, if a company is the owner of the stock, such offerings may incentivize eco-design and reduce the impacts during the use phase, as many of these offerings include professional care. From a sufficiency perspective, Iran and Schrader (2017) suggest that these offerings could result in users feeling satisfied with what they have, eliminating the desire for new products.

In addition to this study, Zamani et al. (2017) conducted a life-cycle analysis of clothing libraries, which is another example of collaborative consumption in the fashion sector. They defined a series of scenarios based on lifetime extension, mode of transportation and type of distribution channel. The authors highlight the risks of rebound effects and problem shifting regarding this type of offerings, i.e. environmental impact reductions in one stage can be offset in another stage. For example, Zamani et al. found quantitative evidence that environmental impact reductions in the production phase, particularly associated to global warming potential, were offset by the impacts of increased customer transportation in their offline scenario.

In this section, we illustrated how fashion subscription services are examples of circular offerings in the fashion/clothing sector. Under this model, a company offers its customers access to their collection of garments in exchange for a monthly fee which aims at extending the service life of garments. Although Park and Armstrong (2017) classified this type of business model as a form of collaborative consumption, it better fits the description of a use-oriented PSS as defined by Tukker (2004) because the company owns the inventory which is circulated among its customers. Independently of the category relevant for fashion subscription services, they are an example of a business using a circular model that aims at intensifying the use of materials via recirculation.

2.2. User acceptance of sustainable offerings

Circular offerings in the fashion/clothing sector can be considered an example of sustainable consumption, and as such, they face challenges regarding user acceptance (Ceschin, 2013; Kirchherr et al., 2017; Tukker, 2015). Gwozdz et al. (2017) found a systematic lack of user support for alternative forms of consumption of clothing such as clothing rental, leasing and swapping. In this section, we offer an overview of different theoretical approaches from the field of sustainable consumption that aim at explaining why people change the way they consume. The purpose of this

overview is to provide a theoretical basis for classifying the findings from the literature and the data.

According to different reviews on research about consumption (Halkier et al., 2017) and sustainable consumption (Jackson, 2005; Reisch and Thogersen, 2015), research on the topic has used three different approaches when explaining why people consume: the individual perspective, the social structure and social practices. Approaches using an individual perspective include explanations based on economic, psychological and cultural factors. Economic explanations assume that people are utility-maximising individuals who make decisions based on cost-benefit analyses and suggest that aspects such as price, risks and information are fundamental when making a choice. According to (Jackson, 2005) criticism against these explanations point out that people have bounded rationality; they follow emotions and are creatures of habits.

Alternatively, social psychologists such as Ajzen (1991) developed the Theory of Planned Behaviour (TPB) suggesting that behaviour depends on the attitudes of the individual, the personal or subjective norms and the perceived behavioural control. This explanation has faced some criticism, particularly regarding their lack of insight into moral, affective and habitual processes, the assumption that only attitudes form behaviours when research has illustrated how behaviours also affect attitudes, and the absence of context in explanations about what influences behaviour. Extended formulations of this model in the context of sustainability have incorporated aspects such as norms and habits (Bamberg et al., 2007; Klöckner and Blöbaum, 2010).

The final set of theories using the individual as the main unit of analysis is referred to as Consumer Culture Theory (Arnould and Thompson, 2005). Here, consumption has a symbolic value to the individual and is thus not only about satisfying physical needs but also non-materialistic (Arnould and Thompson, 2005). Examples of studies using a cultural approach to sustainable consumption include investigations about anti-consumption (Chatzidakis and Lee, 2013), voluntary simplicity (McDonald et al., 2006) and green identities (Autio et al., 2009; Hurth, 2010).

In contrast to these individual-based explanations, authors such as Schor (2008) suggested that social structures and conventions are at the heart of consumption. She investigated how working life conditions, such as work time could alter consumption patterns. Sanne (2002) discussed how societal transitions such as urbanisation had influenced user preferences for independent houses and consequently have increased demand for household appliances. Changing consumption would then require altering such social structures and their dynamics, beyond the direct influence of individuals.

A third perspective focuses on social practices, in an attempt to bridge these two approaches based on the individual and on social structures. A practice was defined by Schatzki (2001, p. 11) as the "embodied, materially mediated arrays of human activity centrally organized around shared practical understanding." Examples of practices are washing, commuting and driving. However, they are not only the result of the individual's doing; they are the result of many people performing them and reproducing their elements. Consumption patterns are the result of the intersection of multiple practices in one individual (Warde, 2005) and changing such patterns can only happen if the elements of the practice are (re) configured or new practices are adopted. In research on sustainable consumption, this approach has been used to study inconspicuous consumption, based on routines and to offer additional accounts that could address the 'intention-behaviour' gap (Welch and Warde, 2014). Within practices, the elements that constitute them (meanings, competencies and materiality as suggested by Shove et al. (2012)), the interlinkages between such elements and other practices (Mylan, 2015), and the opportunities for embodiment (Huber, 2017), all influence the level of engagement with a certain practice.

The literature on sustainable consumption reveals how changing consumption patterns can be explored from different ontologies, the individual, social structures and/or social practices. As a result, researchers have suggested economic (Armstrong et al., 2015; Frota Neto et al., 2016; Hazen et al., 2017), psychosocial (Harris et al., 2016; Laitala, 2014b; Pizzol et al., 2017), cultural (Akbar et al., 2016; Lang and Armstrong, 2018) and socio-material (Petersen and Riisberg, 2017; Rexfelt and Hiort af Ornäs, 2009) factors and conditions that influence acceptance and further adoption of sustainable consumption patterns. Economic factors include price, income and the provided information about the product or service. Psychosocial factors refer to the attitudes, beliefs, values, personal norms, and perceived behavioural control; it also can include emotions and habits. Furthermore, cultural factors refer to how consumption activities help individuals build a sense of identity and to communicate with others. Finally, socio-material aspects do not pertain to the individual but influence whether and how people engage with practices that contribute to sustainability.

2.3. User-generated content for consumer research

The digitalisation of business has transformed many relationships between customer and company by opening new roads for interaction. While in the era of traditional offline businesses user research was done using traditional tools such as surveys and interviews, today the Internet has become a new "lieu" for data collection (Hine, 2000). User-generated online reviews have become a new source for this type of research. Yang and Fang (2004, p.310) initially defined online reviews as "an exception-reporting mechanism for identifying weaknesses to be corrected or strengths to be reinforced." More recently and as the result of the expansion of the digital economy, online customer reviews are defined as "peer-generated product evaluations posted on the company or third party websites" (Mudambi and Schuff, 2010, p. 186). They are considered by Dholakia and Zhang (2004) as a new emerging form of qualitative data in the era of the Internet that can unveil positive and negative aspects of the offering reviewed.

User-generated online reviews are a form of electronic word of mouth, a peer-to-peer way of non-commercial communication that offers information about products and services on the internet, via different channels (Mauri and Minazzi, 2013). This type of communication is an important source for users when planning to acquire a product or a service online (Cui et al., 2012). Although the existence of product reviews and the option to access them has proven to have a positive relationship with sales, more recent research has found that content and helpfulness are more relevant features (Korfiatis et al., 2012). These authors defined helpfulness as the level at which a specific review was found useful by other users when deciding what product or service to acquire, while content refers to the quality of the insight provided by the reviewer. Content can help clarify the elements that contributed to the specific experience.

From a research perspective, Dholakia and Zhang (2004) argue that online data sources such as user-generated reviews are advantageous and provide seven characteristics to support their claim:

- Text-based: they allow people to be more articulate regarding what they want to communicate and they afford the use of traditional forms of quantitative and qualitative data analysis.
- Public: the costs of acquiring the data are rather low compared to traditional tools such as surveys.

- Anonymity: they allow participants more freedom to express what they want. However, in some cases, as in user-generated online reviews, anonymity is seen as a limitation, and personal information is seen as a sign of credibility (Korfiatis et al., 2012; Mauri and Minazzi, 2013).
- Unbiased input: reviewers usually do not expect to receive a pecuniary reward for providing the information, which usually results in the unbiased input. However, in the specific case of online reviews as a data source, there have been cases of paid reviews.
- Unsolicited data: information shared on the internet and on different sites is often unsolicited by the researcher, thus providing unfiltered data that is not limited by specific questions.
- Permanent availability: online data is constantly generated and usually remains available, allowing the researchers to come back and to perform longitudinal analysis, what the authors called temporal flexibility.
- Geographic diversity: participants are usually from different locations, offering the opportunity to get insights from diverse geographies, a common limitation with more traditional forms of data collection techniques.

Different industries, with the help of researchers, have been using user-generated online customer reviews as a source of data to understand their customer base. For example, Yang and Fang (2004) used reviews to identify relevant service dimensions explaining satisfaction and dissatisfaction in the securities sector. Mauri and Minazzi (2013) used web-based reviews to assess their influence on the purchasing decision of young customers in the accommodation sector. They explored how valence and the credibility of online comments affected the purchasing decision of their target audience. They defined valence as the positivity or negativity of the review, while credibility referred to how convincing the argument presented by the reviewer seems to the customer or its validity. Credibility depends on three aspects; first, how much personal information about the reviewer is available. Second, the description of the actual experience, and third, how much the review is in agreement with other reviews.

Although online customer reviews are increasingly used as a source for user research, they present some limitations. First, individuals that post customer reviews are not representative of the general customer base of a company; they are committed individuals that take the time to write down their experiences (Hu et al., 2009). In addition, they tend to report extreme experiences, either positive or negative, which do not necessarily account for the experiences of the average customer. As a result, conclusions resulting from their analysis might not be generalizable to a wider population. Moreover, since customers do not have objective reference points to evaluate the performance of the product or service, their reviews only reflect subjective interpretations of the offering. Finally, there is always the risk of competitors creating fake reviews which in some reports have been estimated to account for one-third of all online reviews (Mauri and Minazzi, 2013; Munzel, 2016). The advantages of user-generated online reviews as a data source to explore success factors and barriers for user acceptance strongly outweigh these shortcomings, thus justifying their potential.

3. Materials and methods

In order to answer our two research questions, an exploratory study was conducted. First, factors influencing user acceptance of circular offerings in the fashion/clothing industry were identified by means of a literature study. Then, three case studies were analysed to explore the suitability of user-generated online reviews in identifying factors and conditions of acceptance. The study followed a qualitative research approach by analysing customers' perceptions of the service provided by the selected companies expressed through user-generated online reviews.

3.1. Literature review

As the first step in this research, we conducted a literature study to identify relevant inputs that addressed consumer and user acceptance. A structured search in two major scientific literature databases, Web of Science and Scopus was conducted using different keywords and strings: "product-service systems", "eco-efficient services" "sharing economy", "collaborative consumption". Each of these terms was combined with the keywords "user" and "user". Additional queries were applied using terms such as "clothes swapping", "clothes reselling", "second-hand clothes", "clothes leasing", "clothes renting" in combination with "user" and "user", to supplement this set of papers, resulting in five additional articles. The set of articles selected was complemented following a back and forth snowballing procedure searching for articles that either used the selected studies as references or were referenced by them. The references selected are presented in Table 1. Each article was read, and factors of acceptance were identified. The collection of factors was then organized in order to find similarities among factors. Similar factors were grouped together. Each group of factors was then analysed looking for common denominators following the theory discussed above (economic, psychological, cultural). The common denominator for each group was used as the category label.

3.2. Case studies

Three US-based companies (A-C) offering online fashion subscription services were selected as case studies as presented in Table 2. All companies have a subscription revenue model that offers subscribers the option to access a fixed number of clothes periodically in exchange for a monthly payment. Although each case is different, they share basic characteristics regarding the service.

Following a simple customer journey, a fashion subscription service entails four basic stages: pre-order, order, use and post-use. During the pre-order phase, subscribers are expected to browse the company's website and decide what items they wish to receive.

Table 1
Literature on user acceptance by type of circular offering.

Offering	Authors
PSS	Armstrong et al. (2015)
	Armstrong et al. (2016)
	Petersen and Riisberg (2017)
	Rexfelt and Hiort af Ornäs (2009)
Sharing economy	Akbar et al. (2016)
	Albinsson and Yasanthi Perera (2012)
	Cervellon et al. (2012)
	Gopalakrishnan and Matthews (2018)
	Gwozdz et al. (2017)
	Johnson et al. (2016)
	Laitala (2014b)
	Lang and Armstrong (2018)
	Matthews and Hodges (2016)
	Netter (2017)
	Park and Armstrong (2017)
	Pedersen and Netter (2015)
	Roux and Guiot (2008)
	Weber et al. (2017)

Table 2
Main characteristics of the companies selected as case studies ("Crunchbase, 2018").

Company	Founding date	Target audience	Service offered	Capital raised	No. of Employees
Company A	2011	Plus size women	Borrowing	100 Mill	51–100
Company B	2009	Women	Renting	176.2 Mill	251–500
Company C	2012	Women	Styling	62.5 Mill	11–50

During the order phase, the user communicates a decision to the company. In the use phase, the subscriber receives the items and uses them. All three companies offer professional care of the garments, so customers are not expected to wash the garments. Once the clothes are used, the user has to send them back to the company during the post-use phase. They are also expected to write a review of the experience. The company receives clothes and prepares them for the next customer. All companies have a purchasing option so members can keep items at a discounted price.

User-generated online reviews were collected from a third-party site, www.sitejabber.com, which has received public funding to develop adequate measures to avoid biased and fake reviews (National Science Foundation, 2011). This website requires reviewers to log in to the site and provide at least their name and email address. They also have the option to register via Facebook, which gives the review site access to their public profile, list of friends and email, but only their first name is publicly available on the site. By doing this, the site aims at reducing the risk of fake reviews. According to their Terms of Use, fake reviews are strictly forbidden, and people engaging in such practices risk being prosecuted. The site offers a comprehensive description of how to write a review and what to avoid to assist reviewers in creating useful content. It also requires that the review is at least 100 characters long.

The reviews on this site range from one to five stars. One-star reviews express an extremely negative experience (the website has pop-up aids that provide hints on what each rating means, in this case, they stated 'Doesn't get any worse than this, and stay away'). Five-stars reviews reflect extremely positive experiences (the company provided the following aid to explain what a five-star review means: 'So you love it so much you want to tell the entire world'). A mid-rating is suggested to reflect an average experience.

The company uses a combination of automated processes with human audits to assure the authenticity of the input. The objectivity of reviews as a source for product or service quality assessment is beyond the scope of this study, as we focus on the user's perception of the experience. Therefore, it is less relevant here. For the above reasons, it is clear that our findings have limited potential to be generalizable. Nonetheless, they are considered useful in our exploration of success factors and barriers to user acceptance.

In total, 123 reviews were mined from the customer review site using R studio software. Only the comment section of the review was extracted from the website for analysis. The Website's Terms of Service data mining and extraction requires expressed authorisation. We got authorisation via email on September 15th, 2017 by their Customer Support Department. Individual consent was not sought because personal data was not collected and because the information used in this study falls under the category of public data as defined by the Norwegian Centre for Research Data. According to the website's Terms of Reference, when a person makes a post on this website, they agree to give permission to the site to use the content to their discretion. Also, the Terms of Service indicate that users should be aware that the data they share will be publicly accessible. Nonetheless, users' personal information was purposely not collected.

We collected all reviews written between January 2016 and August 2017. According to the site guidelines, reviewers are expected to write an entry on actual experience, so here we assumed that the reviews used as data were the result of using the service. Table 3 presents a summary of the reviews collected for this study regarding companies and rating.

An initial inspection of the data using NVIVO query tools was conducted in order to identify the topics mentioned in the data. The findings were then compared with the list of factors from the literature study to find alignments and misalignments. This initial approach was then followed by qualitative content analysis. The qualitative analysis followed a double-cycle coding strategy (Saldaña, 2009). A member of the research team conducted the first coding cycle, and then the other researchers in the study supervised the results to assure consistency. During the first cycle, a descriptive coding strategy was used to look for topics and issues frequently mentioned in the data that had the potential to become themes. A values coding technique was applied in parallel examining the data for attitudes, beliefs and values. Additionally, we looked for actions and activities that affected the perception of the users regarding the service using process coding. The second-cycle coding combined structural coding and hypotheses coding for finding patterns among the results of the first cycle (Saldaña, 2009). The Constant Comparison Method was used as the reviewing technique. Following the steps suggested by Boeije (2002), we analysed each review to find the topics and issues, then each review from a given company was compared to the other reviews in the same company looking for similarities and differences in the themes and topics. Finally, the findings for each company were compared to decide on a set of issues and factors.

3.3. Suitability of user-generated online reviews

In order to assess the suitability of user-generated online reviews to provide insights regarding user acceptance of fashion subscription services, we first considered the aspects that authors such as Korfiatis et al. (2012) and Mauri and Minazzi (2013) offered to evaluate the credibility of user-generated online reviews for purchase decision-making:

- To what extent the comment provides personal information that allows the reader to assess if the content is based on real experience or not.
- The description of the experience and how balanced it is in terms of positive and negative aspects.

Table 3
Distribution of user-generated online reviews collected and analysed.

Rankings	Company A		Company B		Company C		Total	
Positive reviews	37	46%	**8**	25%	**3**	27%	**48**	100%
5	19	24%	7	22%	2	18%	28	58%
4	9	11%	0	0%	0	0%	9	19%
3	9	11%	1	3%	1	9%	11	23%
Negative reviews	43	54%	**24**	75%	**8**	73%	**75**	100%
2	11	14%	2	6%	2	18%	15	20%
1	32	40%	22	69%	6	55%	60	80%
Total reviews	80	100%	**32**	100%	**11**	100%	**123**	100%

- How aligned the comment is with the rest of the reviews.

Then we used the seven characteristics of online data provided by Dholakia and Zhang (2004) and introduced in section 2.3 to discuss the advantages and disadvantages of user-generated online reviews for researching user acceptance: text-based data, public, anonymity, unbiased, unsolicited, permanently available, geographic diversity.

4. Results

This section reports the findings from the analysis of the user-generated online reviews for the companies offering fashion sub-scription services and discusses them in the context of the existing literature. It also argues in favour of the suitability of user-generated online reviews to explore this question in terms of the general aspects presented in the literature review section.

4.1. Factors and conditions influencing the acceptance and adoption

According to the literature review, acceptance of and participation in different types of circular offerings is influenced by several factors and conditions as illustrated in Table 4. A first category refers to economic factors. Within this category, most studies have investigated the role of risk and costs associated with circular offerings, followed by the characteristics of the offering and the price. Gratification defined as the level of satisfaction derived from the offering was investigated in three studies. Only two studies included income as a variable influencing acceptance.

Regarding costs, authors found that people value the potential savings resulting from engaging with circular offerings. However, in one case it was indicated that such savings could be offset by high transaction costs. Risks were also an important aspect considered in the literature. They refer to concerns about hygiene and health, personal liability, and the ability of the provider to deliver on their promise. In one case, researchers found that the nature of the solution improved trust because the user knew the provider. More formalised forms of offerings were also perceived as less risky. The second category encompasses demographic aspects. Authors have explored four aspects, age, gender, level of education and geographical location.

Thirdly, research has also focused on psychosocial factors including attitudes regarding collaborative consumption and circular offerings, and the level of attachment towards products. Under this category, authors also explored behaviours such as use, disposal and acquisition. Several studies investigated personality characteristics such as materialism and nostalgia. Environmental values were another important factor in the literature. A person that holds this type of values cares about other species and habitats and are more likely to have an ecological worldview. Authors also considered factors such as subjective norms, past experiences, integrity and perceived behavioural control. The fourth set of aspects addressed in the literature are cultural factors. This group includes aspects such as experience and experimentation, interaction with other users, fashion involvement, the desire for change and uniqueness, political consumerism, identity, and status.

The last category refers to the socio-material conditions that can foster or hinder participation. It includes aspects such as everyday

Table 4
Factors and conditions influencing acceptance and adoption of circular offerings in the literature.

Category	Factor	Literature
Economic	Costs	(Armstrong et al., 2015; Cervellon et al., 2012; Laitala, 2014b; Matthews and Hodges, 2016; Pedersen and Netter, 2015; Petersen and Riisberg, 2017; Rexfelt and Hiort af Ornäs, 2009; Roux and Guiot, 2008)
	Gratification	(Gopalakrishnan and Matthews, 2018; Matthews and Hodges, 2016; Pedersen and Netter, 2015)
	Offering	(Akbar et al., 2016; Armstrong et al., 2016; Laitala, 2014b; Park and Armstrong, 2017; Roux and Guiot, 2008)
	Income	(Gwozdz et al., 2017; Weber et al., 2017)
	Information	(Matthews and Hodges, 2016; Petersen and Riisberg, 2017)
	Price	(Armstrong et al., 2016; Gopalakrishnan and Matthews, 2018; Park and Armstrong, 2017; Roux and Guiot, 2008)
	Risks	(Armstrong et al., 2016, 2015; Laitala, 2014b; Matthews and Hodges, 2016; Park and Armstrong, 2017; Rexfelt and Hiort af Ornäs, 2009)
Demographic	Age	(Armstrong et al., 2016; Gopalakrishnan and Matthews, 2018; Weber et al., 2017)
	Gender	(Gopalakrishnan and Matthews, 2018; Gwozdz et al., 2017; Pedersen and Netter, 2015; Weber et al., 2017)
	Level of education	Cervellon et al. (2012)
	Geographical location	Gwozdz et al. (2017)
Psychosocial	Attitude	(Akbar et al., 2016; Johnson et al., 2016; Lang and Armstrong, 2018; Park and Armstrong, 2017)
	Behaviours	(Gopalakrishnan and Matthews, 2018; Gwozdz et al., 2017)
	Environmental values	(Armstrong et al., 2015; Cervellon et al., 2012; Gopalakrishnan and Matthews, 2018; Gwozdz et al., 2017; Laitala, 2014b; Pedersen and Netter, 2015; Petersen and Riisberg, 2017; Roux and Guiot, 2008)
	Materialism	(Akbar et al., 2016; Johnson et al., 2016; Lang and Armstrong, 2018; Roux and Guiot, 2008)]
	Subjective norms	(Johnson et al., 2016; Lang and Armstrong, 2018)
	Other	(Cervellon et al., 2012; Johnson et al., 2016; Lang and Armstrong, 2018; Roux and Guiot, 2008)
Cultural	Desire for change	(Armstrong et al., 2016, 2015)
	Experience	(Gopalakrishnan and Matthews, 2018; Laitala, 2014b; Roux and Guiot, 2008)
	Experiment	(Armstrong et al., 2016, 2015; Pedersen and Netter, 2015)
	Fashion involvement	(Cervellon et al., 2012; Laitala, 2014b; Lang and Armstrong, 2018; Pedersen and Netter, 2015; Weber et al., 2017)
	Interaction	(Matthews and Hodges, 2016; Park and Armstrong, 2017; Pedersen and Netter, 2015; Petersen and Riisberg, 2017; Rexfelt and Hiort af Ornäs, 2009; Roux and Guiot, 2008)
	Uniqueness	(Akbar et al., 2016; Cervellon et al., 2012; Lang and Armstrong, 2018; Roux and Guiot, 2008)
	Political position	(Park and Armstrong, 2017; Roux and Guiot, 2008)
	Identity and status	(Cervellon et al., 2012; Laitala, 2014a)
Socio-material	Daily life	(Matthews and Hodges, 2016; Rexfelt and Hiort af Ornäs, 2009)
	Ease of use	(Armstrong et al., 2016, 2015; Pedersen and Netter, 2015)
	Legal	(Park and Armstrong, 2017; Petersen and Riisberg, 2017)
	Location	(Gwozdz et al., 2017; Pedersen and Netter, 2015)
	Technology	Netter (2017)

lives, convenience, legal issues, technology and location. Everyday lives refer to the new activities people need to engage in or the ones they stop performing because of the service, e.g. laundering. Convenience addresses the competencies, skills and capabilities users require for acquiring and using the service. Legal aspects refer to the characteristics of the contract and other terms and conditions of the service. Technological aspects address the usability of the digital platform. Location refers to the online or offline character of the offering from where companies operate.

4.2. Acceptance and adoption of fashion subscription services

Based on this categorisation, we grouped the codes derived from the empirical data. Fig. 1 presents the distribution of codes among categories of factors. In general, economic factors were mentioned more frequently (55% of the items coded) followed by socio-material conditions (23%), psychosocial factors (18%) and cultural factors (4%).

Fig. 2 illustrates the distribution within each category. For cultural factors, the desire for change (47% of the items coded), and identity and status (27%) were recurrently mentioned by reviewers. For the economic factors, reviewers commented most on the offering (49%), followed by information aspects (22%), costs (11%), risks (8%), price (7%) and gratification (2%). Attitudes (83%) were the psychological factor most mentioned in the data. Finally, within socio-material conditions, reviewers provided more input regarding how using the service influenced their everyday life (71%).

As Table 5 illustrates, reviewers considered most of the economic factors mentioned in the literature except for income. Users mentioned the offering most repeatedly, along with information. Costs and benefits, both monetary and non-monetary appeared in the comments but not as often.

Reviewers mentioned socio-material conditions very frequently as well. User-generated reviews provided a level of detail regarding the activities people get involved in or avoided as a result of their participation in such offerings that allows to better understand the impacts the solution had on the user's daily life as presented in Table 6. These activities were organized following Rexfelt and Hiort af Ornäs (2009) framework of required, avoided and resulting activities. Moreover, we loosely classified them according to the
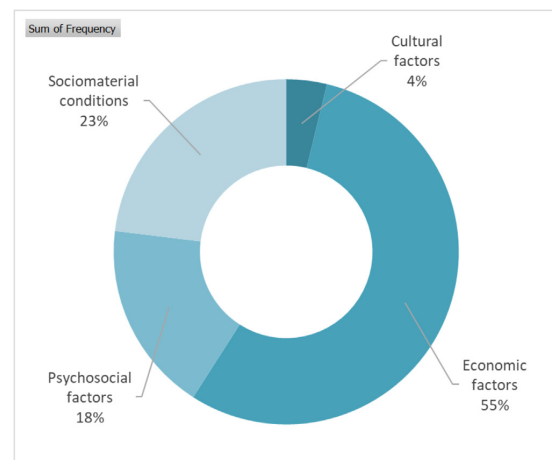

Fig. 1. Distribution of factors by category.

stages of the service. Pre-order refers to the process of deciding what to order. Order is the stage when a client asks for a certain set of garments. The use phase refers to the enjoyment of the items, and post-use refers to the return of the clothes.

Beyond impacts on daily life, online reviews also offered insights into aspects such as ease of use, the legal implications of the services, the role of location and technology, occasionally identified in the literature. Technological and legal aspects have been explored only by one study each, for example. Although the frequency of these topics in the data is not high, it does point to relevant areas for future work. Quotes illustrating these aspects are presented in Table 7.

Psychosocial factors come in third place regarding frequency. Within this category, attitudes were the most popular aspect (83% of items coded), followed by materialism (9%) and behaviour (8%). In comparison with the previous two sets, users mentioned this type of factors less often. Factors that were prominent in existing literature such as values (in particular environmental values) were not observable in the data. We speculate that this is due, in part, to the nature of the data as users are expected to comment in their reviews on their experience with the service and the way companies communicate their offering rather than their own personality. Other aspects such as nostalgia, previous experiences, perceived behavioural control and integrity that were explored by academics were not mentioned in the reviews either (Table 8). This can also be a result of the nature of the data source. Thus, online reviews may not be sufficient to provide insights about the user internal characteristics, such as values, beliefs or norms.

Cultural factors were the least mentioned in the empirical data. The reviews that addressed this issue focused on how the service helped them satisfy their desire for change (47% of the items coded), identity and status (27%), experimentation (13%), uniqueness (3%) and fashion involvement (3%). Other aspects brought up in the literature such as interaction, experience and political positions did not appear in the reviews (Table 9). We suggest this could be the result of several reasons. First, the digital nature of the reviewed businesses may reduce the user's interaction with the company as compared to other forms of collaborative consumption, e.g. swap parties or fashion libraries. Second, they offer a form of PSS, where the transaction happens between a company and a user and not among peers. Third, and regarding political consumerism these companies are not marketed as defying the current economic model, on the contrary, they are presented as an evolution of traditional retail channels. Thus, users may not perceive the business offering as a form to address these aspects.

Finally, we were not able to retrieve any demographic data; however, our three case studies only offered women's clothing. Thus, it is safe to suggest all reviewers were women. Regarding other demographic variables, we did not have access to them via the reviews.

4.3. User-generated online reviews as a data source

This study had a two-fold purpose, to explore the factors and conditions that support participation in circular offerings in the clothing sector, and to assess the suitability of user-generated online reviews as a data source for exploring such question. In the previous section, we presented the findings regarding the first question. In this section, we offer insights regarding the convenience of using online reviews. To assess the suitability of user-generated online reviews as a data source to explore the main research question, we considered two dimensions, the credibility of the reviews and their suitability compared to other sources of data as elaborated in section 3.3.

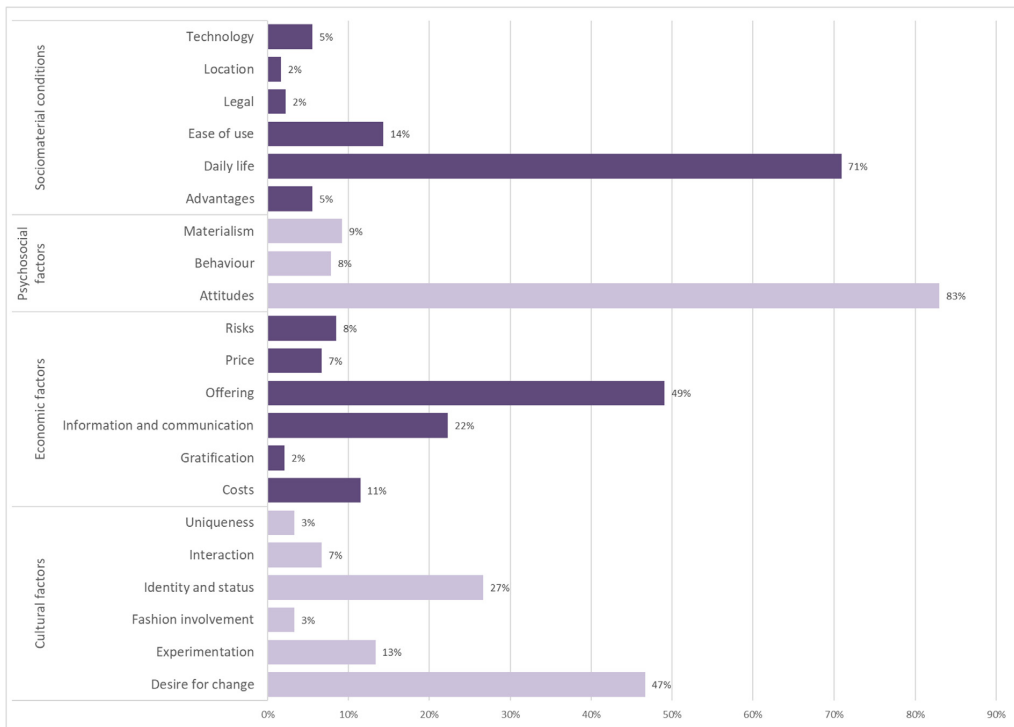Regarding the credibility of the reviews, three aspects were

Fig. 2. Frequency of codes by factors.

considered, the availability of personal information, the description of the first-hand experience and the balance between the positive and negative aspects of the review. As detailed in section 3.2 the selected site for collecting the empirical data used in this study requires reviewers to provide basic personal data such as name, last name and email. It also provides guidelines for reviewers to provide relevant information and requires reviews to be at least 100 characters long. Although they cannot guarantee that users will follow their guidelines, they have developed a tool for other users to mark a review as useful or not. In this sense, using online reviews from a third-party site can help improve credibility.

To assess the suitability of user-generated online reviews in comparison to other sources, seven aspects were considered: the type of input, e.g. if it is text-based as opposed to audio-visual, public availability, anonymity, unbiased, unsolicited, reliability and geographic diversity. Online reviews are readily available in digital text form as opposed to oral forms of collecting qualitative data such as interviews, which need to be transcribed. Accessing reviews requires basic data mining skills for web scraping the data and organising it in a format easy to process. Most online reviews are publicly available; however, there might be restrictions for third parties that need explicit authorisation from the site as in this case. Stricter privacy regulations might pose challenges to using this type of source in the near future. Nowadays, and in an effort to prevent fake reviews, users are expected to provide some type of personal information eliminating the advantage of anonymity. Although there have been cases of paid user-generated reviews on other sites, on the site used for this research this practice is forbidden in order to guarantee unbiased content. Because the reviews were mined and not requested by users, the content has not been influenced by

the interest of the research. The data is still available, and new information is being added that could be used to further the present analysis. Finally, although the case studies were all based in the U.S., the online reviews used to come from a variety of locations within the country, which could be difficult to achieve if traditional data sources had been used.

User-generated online reviews used in this study proved to be credible and suitable for analysis. They complied with most of the conditions set in the literature as defined in section 3.3. Moreover, they helped gain detailed insights regarding the offering's features that were more relevant for real users. They also provided insights about how the offering influenced their daily lives, an area lacking information from real-life experiences. Besides, via online reviews, we were able to access a significant number of subjects (123) and gather information about their experiences, which would have been more difficult using traditional data collection techniques such as interviews or focus groups. Nonetheless, the information provided in the reviews did not offer much understanding regarding more personal or unconscious factors gathered under the psychosocial and cultural categories.

5. Discussion and conclusions

Exploring user acceptance and adoption of solutions that contribute to environmental sustainability is a topic that has occupied researchers for at least two decades. Some contributions have been made regarding the factors that influence such intention and behaviour. However, and according to Qu et al. (2016), most research addressing acceptance of circular offerings such as Product Service Systems has been done using scenarios describing potential

Table 5
Economic factors influencing the acceptance and adoption of fashion subscription services.

Factor	Description	Quotes from online reviews
Costs	Authors found that people value the potential savings resulting from this type of offerings. However, potential transaction costs are also a concern. Some personal characteristics related to economic aspects such as frugality and thriftiness have been highlighted by the literature	*After adding up my yearly cost I have saved hundreds if not thousands of dollars in purchase and dry cleaning cost.* *I called to cancel my membership in September of last year and they have been drafting money out of my account every month since then.*
Gratification	The potential of the solution to offer a benefit that is not only financial has been also identified by the literature as influencing the decision of a person to participate. Particularly, the probability of extracting high user surplus from the offerings.	*I got so many compliments on my jacket, love the colors.* *Everyone raves about my beautiful dresses, and my coworkers and students look forward to what I'll wear next.*
Offering	The type of product, the quality, the materials of what it is made, how does it match the style of the user and in more practical terms, if it fits, are aspects considered by the user regarding these offerings. Also the service that allows customer access the function of the product is included here.	*I signed up for the service in December and received 2 garments. One was decent, the other was eh. I agree with a previous review that they were smelly.*
Income	Only two papers explored the relationship between income and the likelihood to participate in circular offerings and the evidence is not conclusive, in some cases it helps but in others there was no significant relationship	Not mentioned
Information	Economic agents need perfect information (complete and symmetrical) to maximize utility. Some studies indicated that information was valued by users in two senses, one regarding how the service works, and the other, how the service is narrated, what stories are told around it.	*I couldn't find anywhere that really explained how the process works. It was very confusing. It was after reading some reviews that I figured you have to fill your "closet" before anything will ship out.* *While I appreciate their prompt response on customer service inquiries, I don't feel like anything is being done to rectify the slowness.* *Customer service is unresponsive and inadequate.*
Price	The fundamental factor influencing decisions from an economic perspective is price. Not all the studies explored it as a factor. Fair and low prices were two aspects regarded by users as positive. High prices were not appreciated.	*I enjoyed my rentals, but $150 a month is too much. $100 a month makes sense to me.* *If I were to have any complaints, it would be that it's a bit expensive ... I pay about $72/month for two clothing articles at a time, though that ends up being around four-six new outfits/month and shipping is always free, so it's really not so bad. I would recommend this service to anyone who works in an office and likes to try new styles and clothes, but at an affordable price.*
Risks	Making decisions under uncertainties entails risk, which is problematic for maximising agents. In these types of offerings risk is considered as high particularly regarding hygiene and health issue, which depends on the image and reputation of the provider. Another risk suggested in the literature is the potential personal liability regarding the products since users are not the owners. However, in one case, it was mentioned that these offerings helped reduce risks because the origin of the product is known, a peer.	*I feel like they are going to keep my money by saying they never received the items back* *The clothes weren't worth it, they smelled and selection sucked.* *The clothes appeared to be worn for the past twenty decades.* *I never got anything smelly or really bad looking. the clothes were in amazing condition when arrived,*

Table 6
Impact on everyday life: changes in activities.

Type of activity	Pre-order	Order	Use	Post-use
Required	Planning/waiting for the dress/ordering in advance	Trying the free month	Keeping the closet full/choosing what to wear	Purchasing/keeping items
	Read items reviews/writing reviews	Checking new things/unsubscribing from emails	Returning the dress	N.A.
	Figuring out size/fitting perfectly	Using the priority button	Marked items as returned	N.A.
	Shopping online	Putting items on hold	Recording proof of return	N.A.
Avoided	N.A.	Choosing what to wear	Wearing clothes rarely	N.A.
	N.A.	Going out	Not laundry	N.A.
	N.A.	Having to purchase/not spending lots of money	N.A.	N.A.
Resulting	N.A.	Changing wardrobe	Trying new things	Returning customer/keeping the service/upgrading service
	N.A.	Try it before you buy it		Referral

solutions due to the lack of real-life examples. This characteristic limits the studies' explanation power. Today, and thanks to the implementation of digital businesses and the popularisation of ideas related to the circular economy, entrepreneurs have set businesses that offer a unique opportunity to overcome this limitation. Additionally, existing studies on acceptance and adoption of circular offerings has used mainly data from traditional sources such as interviews and surveys and only few have used novel data sources recently available due to digitalisation (Camacho-Otero et al., 2018). An example of such novel sources of information are user-generated online reviews which offer important advantages for exploring digital businesses (Mauri and Minazzi, 2013). To address these issues and contribute to the literature on the topic, this study used user-generated online reviews of real businesses to explore the question of acceptance and adoption, and compared its results with previous findings in the literature.

In line with previous studies, we found that economic factors such as the type of offering, costs and benefits, both monetary and non-monetary, are relevant for users. Also supporting previous findings, we found that the implications of the offering on daily life were also important for users. This study contributes to the literature on acceptance and adoption of circular offerings such as PSSs in several ways. First, it gathered empirical data from real-life examples of use-oriented PSS in the fashion sector to address

Table 7
Socio material conditions influencing the adoption of fashion subscription services.

Condition	Description	Quotes from online reviews
Daily life	Research has found that the impact offerings have in daily routines depend on the activities influence users' engagement with circular offerings.	*it takes some finagling and getting used to in order to be successful in renting pieces for everyday life.* *I spent 2 h picking out more than 30 items for my closet since I kept getting the notification saying I needed more items in my closet before they start processing my shipment.* *It was hard to cancel and they do not refund your money.* *I was mad at myself for not putting a reminder on my calendar.*
Ease of use	This condition includes how easy is to use the solution, and how well does it fit in domestic life.	*Too much of a hassle, especially when you don't get to decide which clothing items are being shipped to you!* *Just like most of these online services you have to CALL to cancel while it takes just 30 s and a credit card number to sign up to begin with.*
Legal	Only two studies considered legal issues such as the formality of the transactions and the type of agreement required.	*I sent an email declaring that I would dispute all future credit card charges and report them to user agencies if they did not cancel my account.* *What really bothers me the most, is that they have my NEW bank account information that hadn't been release to anyone!!*
Location	The place where the solution takes place, virtual or physical, has been brought up by two studies indicating that it can be unfavourable.	*I live in Chicago so pretty centrally located and it takes 8 days from the day I ship back to the day I receive IF my shopping closet is full.* *Part of the problem is that they only have one distribution centre, and it is located in Ohio. That means there is longer turn-around/shipping times for those of us on the West Coast*
Technology	Only one study was found that explored the technology as a factor influencing user satisfaction, not acceptance. It focussed on the technical features of the solution.	*My notices of PayPal payments were in a junk mail file and I rarely use the PayPal account so I missed this mess - also partly my fault.* *The website is counter intuitive to what you'd like to be able to do (like maybe make a list of the choices you're considering before you pick your final three)*

Table 8
Psychosocial factors for acceptance and adoption of circular offerings in the fashion sector.

Factor	Description	Quotes from online reviews
Attitude	As suggested by the TPB and related models, positive attitudes towards a solution influence intentions.	*Im so disappointed in their "retention" offers after I described my frustration of their charges.* *This is a great way to expand my wardrobe*
Behaviours	Studies addressing behaviours, explored how purchasing, disposal and acquisition behaviours were related to acceptance of circular offerings	*I am a person who gets bored with something after I've worn it a couple of times.* *given how chaotic my home/work life is.*
Environmental values	The literature indicates that environmental values are a significant factor influencing the acceptance of circular offerings. Authors refer to it as eco-consciousness, sustainability focus, ethics and ecology. Only one article suggested they do not matter.	Not mentioned
Materialism	Another aspect that has been frequently researched in regards to intention to participate in circular offerings is materialism and its related construct possessiveness.	*I am an admitted shopaholic and GB allows me to wear clothes for as long as I like with no commitment but with the option to buy at discounted prices.* *It was not unusual for me to purchase a $100 + in online shopping per month for a few new pieces.*
Subjective norms	The individual interpretation of social norms and social behaviour are	Not mentioned
Other	Other factors or aspects explored by a small number of studies included nostalgia, previous experiences with similar offerings, integrity, intention and perceived behavioural control.	*I am a person who gets bored with something after I've worn it a couple of times.* *I'm a happy customer and would recommend Unlimited to any one who is flexible and adventurous*

questions of user acceptance and adoption using a novel data source. Based on these data, it was able to offer an overview of the economic factors that influenced users of use-oriented PSS in the fashion sector. Additionally, it provided a detailed account of the specific activities users are required to perform, avoid or end up implementing because of their participation. This is valuable information for product and service designers working with the circular economy as it offers an overview of the circular offering's customer journey.

In contrast with findings from previous literature, users did not mention environmental values as a factor influencing acceptance and adoption of the service. Why is this the case should be addressed in future research. Moreover, the reviews did not provide many insights into psychosocial and cultural factors. We suggest this could be the result of the nature of the source; because online reviews are considered as exemption event reports, they do not invite users to elaborate on their personal experience and reasons to participate in the service. In addition, online reviews failed to provide demographic information beyond gender, which has been identified as a relevant factor influencing acceptance. Furthermore, and because all case studies had women as their customer segment, the results of this study are only applicable to them. In order to explore gender differences, new research is needed using data from companies serving additional customer segments. Finally, and because online reviews capture the user experience at one point, they do not offer an overview of the user experience over time which can provide more complete understanding of the dynamics of acceptance and adoption.

To address these limitations, future studies should explore how to combine user-generated online reviews with more traditional methods such as interviews, auto-ethnography or non-participant observation to provide deeper and broader insights into the user's personal characteristics and journey with the offering. To broaden explore the role of demographic variables, new research

Table 9
Cultural factors of acceptance and adoption of circular offerings in the fashion sector.

Factor	Description	Quotes from online reviews
Desire for change	In connection with experimentation, users have indicated that these offerings help them fulfil their need for something different.	*What a great way to try different styles without breaking the bank!* *If you don't like the style, you can just wear it once.* *I get to try new things out of my normal comfort zone with the option to buy.*
Experience	Treasure hunting and a pleasant shopping experience involved in these offerings are also expected to influence acceptance.	Not mentioned
Experiment	The possibility to try new styles and brands without investing and test them has also been suggested by the literature as influencing acceptance.	*It's been a really fun way to experiment with different styles and I get a ton of compliments on the dresses I wear.* *I do like having a variety of clothes and this has allowed me to go out of my comfort zone to experiment with things I would never had bought.* *[Company A] has definitely made me a fashionista!*
Fashion involvement	The interest a person has in fashion trends has been an element considered by authors in the area.	
Interaction	This factor refers to the possibility of socializing, creating relationships and community building among users and with providers. Some studies found a positive relationship, others a negative influence with acceptance.	Not mentioned
Uniqueness	The desire for uniqueness, the need to differentiate one-self from others, and how these offerings help individuals fulfil it is another aspect considered by researchers.	*I wore a long red dress from [Company B] to a Gala, in fairness it looked awesome on me, but when I arrived at the Gala I felt that I was in a rented dress because almost every girl there was in a dress I recognized from scrolling through selections off the [Company B], I'm sure they recognized my rental as well*
Political position	This aspect refers to the need to protest the current economic and political system through alternative consumption practices.	Not mentioned
Identity and status	This element refers to the type of message consumption of circular offerings sends about the user, the user's status in society, and reputation regarding the user's social group.	*I got a ton of compliments on all of my dresses* *Everyone raves about my beautiful dresses, and my coworkers and students look forward to what I'll wear next.* *I have received tons of compliments from young to old.*

should also include companies focusing on different demographics since this study only used women-oriented businesses. Finally, additional digitally based and user generated data sources such as social media, forums and customer service chats could help enrich the researchers' understanding of consumer and user acceptance factors.

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PAPER 3

Camacho-Otero, J., Pettersen, I.N., Boks, C., 2019. Consumer engagement in the circular economy: exploring clothes swapping in emerging economies from a social practice perspective. Sustainable Development. https://doi.org/10.1002/sd.2002

Purpose: The aim of this study was to describe and discuss the development of clothes swapping as a circular practice in emerging economies by using a social practices theory perspective. To investigate the conditions that enable the adoption of circular value propositions.

Methods: Empirical data was drawn from 12 interviews with participants and organizers of three clothes swapping initiatives from an emerging economy. Data was analyzed following a qualitative strategy using double coding.

Results: The study described clothes swapping as a practice, including the elements that constitute it, the interlinkages between the elements and between the practitioners. It also provided the base for exploring the practice as performance. Finally, it allowed for characterization of the recruitment processes and the conditions that enabled it.

Contribution: The study contributes with an empirically based account of the elements that intervene in the formation of a circular practice and practitioners' recruitment. It also contributed data and analysis of cases from emerging economies that are underrepresented in existing scientific literature.

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Consumer engagement in the circular economy: Exploring clothes swapping in emerging economies from a social practice perspective

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Abstract

One of the sectors that are being challenged to become circular is the clothing sector. Clothe swapping is considered as an example of a circular solution that enables slowing material loops. However, consumers have failed to widely engage in this type of practice and only a few studies explore this topic using a social practice perspective. This theoretical approach bridges individual and structural approaches to social change. In this study we explore why people in an emerging economy such as Colombia engage in clothe swapping, by exploring it from a social practice perspective. Based on interview and visual data, we explored the configuration of the practice, the interaction between elements, and the reasons why it recruits practitioners. We found that people participate in clothe swapping for economic, environmental, and innovative reasons. In order to perform the practice, three types of elements are involved: material elements such as clothes and place, skills for selecting and preparing the clothes for exchange and rules regarding these materials and behaviours during the event, and images and meanings. We characterised three interconnections between these elements that have been used to enable the practice, and finally, we explored how the participants' networks, histories, and capitals; the social significance of the practice; and its connections to other practices influence recruitment. This approach allowed us to identify paradoxes between the purpose and the implementation of the practice. Future research could use this perspective to compare cases in different socio-economic context.

KEYWORDS
circular economy, consumer adoption, emerging economies, fashion, practice theory

1 | INTRODUCTION

Despite the interest shown by companies and governments in the idea of the circular economy, a system in which products, components, and materials are used multiple times through reuse, remanufacturing, and recycling before being disposed (Kirchherr, Reike, & Hekkert, 2017), consumers seem to be less enthusiastic when adopting the offerings embedded in such business models (Kirchherr et al., 2017; Rizos et al., 2016). Nevertheless, research on this issue is still scarce, and most existing contributions have concentrated on understanding the consumer's intention, or lack thereof, to engage with circular business models (Camacho-Otero, Boks, &

Pettersen, 2018). An alternative perspective that aims at bridging individual and structuralist approaches is provided by social practice theory (Welch & Warde, 2014), which argues that consumption patterns are the result of the different practices in which the individual engages (Warde, 2005, 2014; Welch & Warde, 2014). Despite the interest in this perspective and the contribution it makes regarding adoption, there are only a few studies exploring why people would engage or not in practices that help slow and narrow material flows using this theoretical approach (Fitzmaurice & Schor, 2018; Huber, 2017; Mylan, Holmes, & Paddock, 2016; Pettersen, 2016).

One of the sectors that are being challenged to become circular is the clothing sector. According to recent statistics, global production of garments has duplicated in the last 15 years, and the number of times an item is used before it is discarded by the user has dropped by 36% and reuse of clothes globally is below 15% (Ellen MacArthur Foundation, 2017). Additionally, and according to the same source, the sector has a significant environmental footprint as well. For example, polyester, a popular material for clothing, is produced using fossil fuels, with an estimated demand of 98 billion tons a year. Other environmental impacts related to clothes are water pollution due to chemicals during the manufacturing process (Farrant, Olsen, & Wangel, 2010) and microplastics during the use phase (Brooks, Fletcher, Francis, Rigby, & Roberts, 2017). From a social perspective, the clothing sector has been challenged due to poor working conditions in the countries where garments are produced (Hossain, 2013).

In response to these challenges, designers and activists have proposed different strategies, one of which is use intensification through collaborative consumption (Ertz, Durif, & Arcand, 2016; Laitala, 2014; Park & Armstrong, 2017). One of the specific examples of collaborative consumption in fashion is clothe swapping as it could contribute to reducing demand for new products (Farrant et al., 2010; Iran & Schrader, 2017; Zamani, Sandin, & Peters, 2017). Swapping is defined as the exchange of items, for example, clothes, that happens between two or more people and that is usually not mediated by money (Albinsson & Perera, 2012; Matthews & Hodges, 2016). Most of available research on the topic of clothe swapping and consumption has been conducted in an industrial economy context, but as middle-income countries are catching up with resource consumption trends by high income countries (United Nations Environment Programme, 2017) further exploration in this context is required.

Against this backdrop, this study addresses the question of why people participate in collaborative consumption practices such as clothe swapping in middle-income countries from a social practice perspective. This question is further divided in three subquestions: what elements comprise clothe swapping when understood from a social practice perspective? How do these elements interact to constitute the practice? And what conditions favour or hinder recruitment of practitioners by the practice of clothe swapping? The paper is divided into five sections. After this introduction, we provide an overview of existing research on the topic of clothe swapping. We then move to outline social practice theory as our theoretical framework. Then we describe the method used for collecting and analysing data alongside the case studies used. Following the method, the main

findings are presented and discussed. The article ends with the conclusions and avenues for further research.

2 | CLOTHE SWAPPING AND CONSUMERS

Existing research on why people participate in clothe swapping has focused on exploring this question at the individual level. In an early work, Albinsson and Perera (2009) explored swapping as an example of consumer voluntary disposition behaviour and offered insights into the motives for different types of disposition. They found that individual characteristics such as values and consumption patterns influenced their motives for different modes of clothe disposition (term used by the authors), as did self-concept, self-extension to goods, role models, and family patterns. In addition, they found that perceptions of the local community also influenced consumers. Finally, the item characteristics were also important when deciding what to do next.

In a later work, Albinsson and Perera (2012) focused on the experience of swappers, the drivers, and barriers for participation. They suggested that inclusion as a value helped sharing events to attract more participation. They also found that people framed these events as enabling community building. Finally, they suggest to further research the role of infrastructures in facilitating these initiatives. Armstrong, Niinimäki, Kujala, Karell, and Lang (2015) explored the positive and negative perceptions of consumers regarding swapping. They found that ease of use, financial, and emotional aspects drove both positive and negative perceptions. They continued such exploration by comparing results between two countries, Finland and the United States, in the specific case of digital solutions (Armstrong, Niinimäki, Lang, & Kujala, 2016). They found that perceptions of digitally based circular practices were influenced by the individual's desire for change, and by financial aspects, ease of use, social, and emotional characteristics. Additionally, Matthews and Hodges (2016) investigated what benefits participants did get from engaging in such events. Informants perceived that giving in the context of swapping allowed them to clean their closets, recycle clothes, and get instant gratification. When receiving, they indicated that getting items for free was a benefit; they trusted the origin of the item and welcomed the advice gotten. More recently, Henninger, Bürklin, and Niinimäki (2019) investigated the challenges and opportunities for supply management when consumers become suppliers in the context of swap shops in three European countries. Aspects such as availability, quality, or location are considered as problematic, and environmental consciousness, fashionability, and treasure hunt are opportunities.

Swapping has been a traditional activity of indigenous communities in Colombia as explained by Tocancipá (2008), and it has helped urban communities to face economic crisis in Argentina (Gatti, 2009). According to Tocancipá (2008) for the Kokonuko people, bartering or swapping is a form of resistance against globalization and of reaffirmation of their independence. Their swaps are not only focusing on clothes but mostly food. Moreover, swaps are not only about economic exchange transactions but included cultural activities and

political statements from elders. Gatti (2009) describes how the middle class in Argentina initially used swapping to integrate environmental principles into economic activity and improve quality of life. However, and because of the economic crisis in the late 1990s and early 2000s, swapping transformed into an alternative economic system to face the consequences of the financial crisis. Gatti suggests that swapping was a mechanism to satisfy the material needs of the poorest in Argentina during critical times and helped create social bonds to strengthen communities.

Table 1 presents a summary of the available literature on clothe swapping in general and swapping in Latin America in particular. As is evident, most of the research explores how consumers perceive clothe swapping, what drives them to participate, and what role they play in the system. However, such approaches are constrained to understanding the preconditions for individual behaviour rather that the context and mesolevel aspects that influence such perceptions. Research from the field of sustainable consumption has suggested that broader approaches are needed if people are to move from intention to action (Welch & Warde, 2014).

3 | SOCIAL PRACTICE PERSPECTIVE

According to Schatzki (2001) practices are "embodied, materially mediated arrays of human activity centrally organized around shared practical understanding" (p. 11) and can be understood as practice-as-entity and practice-as-performance. First, practices could be considered as a network of doings and sayings by many different people, grouped in three components, understandings, procedures, and engagements, which is known as practice-as-entity. In a second sense, practices can be understood as the execution of such practices, which in turn results in its reproduction, referred to as practice-as-performance. Such performance of a practice sustains and changes the linkages between the elements of the practice as entity allowing the practice to endure.

3.1 | Social practice as entity

Shove and Pantzar (2005, pp. 44–45) built on this definition and suggested that practices as entities "presume the existence of requisite elements, including images, forms of competence and in many cases objects as well". Shove, Pantzar, and Watson (2012b) defined *materials* as the physical entities that are used when performing a practice such as clothes in dressing. *Competencies and skills*, refer to the knowledge required to operate the materials, perform the practice and evaluate the outcome. In the case of dressing, competence could refer to the knowledge about the size that fits oneself, the instructions for taking care of the garment, and the appropriate dress codes in specific social settings. Finally, *meanings* indicate the images the practice evokes for people, that is, "the social and symbolic significance" people give the practice. In dressing, specific types of garments could be associated with power positions or social occasions. In addition to these elements, Gram-Hanssen (2010) suggested that rules and institutions are also part of social practices.

3.2 | Social practice as performance

As performance, practices are enacted by people, or "carriers" who interpret and integrate the above-mentioned elements in different ways (Pettersen, 2016; Warde, 2005; Warde, Welch, & Paddock, 2017). In her analysis of lighting, Mylan (2015) explores how the different elements of the practice influence and are influenced by each other, describing a trajectory for the practice. From being only about bringing brightness, lighting is now also about experiences, ambiences, and safety. And as a result, new competences for creating such experiences are required from practitioners. A similar analysis was applied to laundering. Changes in ideas about cleanliness have influenced how clothes are cleaned, what materials are required, and competences. Thus, when understanding change of practices, not only the elements are important but also how they affect each other, opening new options for intervention.

TABLE 1 Literature review on clothes swapping

Source	Topic researched	Findings	Geographical location
Albinsson and Perera (2009)	Motives	Values, consumption patterns, item characteristics, communities, role models, self-concept, self-extension goods, and family patterns	United States
Albinsson and Perera (2012)	Barriers and drivers	Inclusion, community building, and role of infrastructure	United States
Armstrong et al. (2015)	Perceptions	Ease of use, financial benefits, and emotional benefits	Finland
Armstrong et al. (2016)	Cross cultural perceptions	Desire for change, financial benefits, ease of use, social aspects, and emotional benefits	United States and Finland
Matthews and Hodges (2016)	Benefits	Clean closets, recycling, instant gratification, free items, trusted origin, and free advice	Not explicit
Henninger et al. (2019)	Challenges and opportunities	Availability, quality or location are considered as problematic, while environmental consciousness, fashionability, and treasure hunt	UK, Germany, and Finland
Tocancipá (2008)	Driving forces, organization	Organizational process, political nature, resistance	Colombia
Gatti (2009)	Values, characteristics	Community building, needs satisfaction, empowerment, and resistance	Argentina

Because practices are performed by practitioners, individuals, they entail interaction between people (Røpke, 2009). As both individuality and social order emerge from practices, practice theories can help understand power dynamics, especially if power "is understood at the most basic level as acting with effect" (Watson, 2016, p. 2). Not many studies have explored this aspect in the context of collaborative consumption and the sharing economy. Fitzmaurice and Schor (2018) and Schor, Fitzmaurice, Carfagna, and Attwood-Charles (2016) explored examples of the sharing economy from the perspective of distinction, using a Bourdieusian approach. They questioned these practices regarding power dynamics and found that although they are presented as democratic and horizontal initiatives that challenge traditional forms of consumption, it is possible to see how different allocations of capital, especially cultural, result in unequal relations.

3.3 | Recruitment and reproduction of social practices

Depending on how many people perform them, practices appear and disappear. The number of people "carrying" a practice depends on the capacity of the practice to recruit participants (Huber, 2017; Shove, Pantzar, & Watson, 2012a). The more people perform a practice, the more normalised it becomes. According to Shove et al. (2012a, p. 2), "the chances of becoming the carrier of any one practice are closely related to the social and symbolic significance of participation and to highly structured and vastly different opportunities to accumulate and amass the different types of capital required for, and typically generated by participation." In addition, Shove et al. indicate that "[a]ccidents of birth, history and location are all important, as are social networks" (p. 3). Practices also need to be rewarding, convey meaning and fit with other social practices. Finally, also the rate of penetration of a given practice or the level of exposure to a given practice contributes to recruitment or defection.

Beyond recruitment, for a practice to survive, practitioners need to reproduce it; they need to "build a career" within the practice which happens through processes of learning and sharing (Shove et al., 2012a). By performing the practices, practitioners "advance" in their careers and change roles, from outsiders, to novices, to experts or "full practitioners," which also reveals high levels of commitment to the practice. Exchanges between different types of carriers allow the practice to abide. Practices disappear because they fail to recruit and retain practitioners or because they need to make space for radical innovations that replace them like cycling and the car. Moral and ideological changes that require new practices to emerge as the old ones become inadmissible also drive practices to extinction. Finally, a temporal dimension is also relevant as some practices are relevant during specific moments in life and others will always be present.

4 | MATERIALS AND METHODS

To answer the research question, why people in middle-income economies participate in collaborative consumption practices, we chose a qualitative approach based on semistructured interviews. We did that because our aim is to explore how people involved in clothe swapping construct it as a practice and what reasons they have to get involved in it and given the lack of previous studies (Creswell, 2014). Moreover, a case study approach was considered adequate as case studies allow for in-depth analysis for specific activities in a given period. This type of research generally generates a thick description of the phenomenon of interest (Stake, 2011).
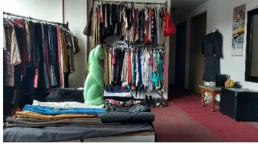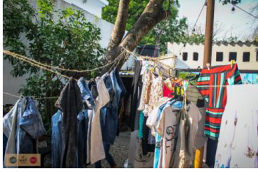
4.1 | Case studies

The case studies were identified and selected based on an online review of existing alternatives, personal networks, and snowballing. Initially, nine swapping initiatives were identified of which seven were contacted via email; no contact information was available for the remaining two. Of the seven initiatives contacted, three were available for the study as described in Table 2.

The three initiatives differ regarding location, organizers, frequency, and fees. Two happened in Bogotá, the capital city of Colombia, the economic and political centre of the country characterised by high levels of urbanisation. The third initiative occurs in Yopal, a rather small but dynamic city in the Eastern savannah of the country. Regarding structure, two are organized by individuals and one is the result of a joint institutional effort of a local nongovernmental organization working on environmental and social development issues and a grassroots movement focused on promoting responsible consumption. Finally, the frequency of the activity is also different, with more frequent events happening in the capital than in the mid-sized city. Initiative A charges a fee to cover expenses, and the other two are free of charge for participants and driven by volunteers.

Initiative A has organized the event in different locations, at first the organizer only looked for coworking spaces but has also used local cafes and hotels. For each event she gets help from three to four volunteers, depending on how big the event is. Some of them receive the clothes and give a token for each item that is accepted. Items that do not pass the filter are returned or can be donated. Another person arranges the clothes as if it were in a clothing store, hangs them in the hangers, folds them, and the participants join parallel activities, such as a documentary screening or workshops. After 1 to 2 hr, people can enter the swapping space and choose what they want to take. At the exit they give one token back for each item they take. Initiative B has a different structure; their events happen on a regular basis at the organizer's house. She opens her showroom twice a week during weekdays. In this space people can donate, sell, buy, and swap clothes. Donated clothes are redirected to vulnerable communities. There is a camera installed in the room for security reasons.

Initiative C organizes events twice a year. In contrast with the previous two initiatives, in this case the swapping event is an institutional event. Two local organizations came together to organize the events as part of their local work supporting sustainability and community empowerment. Based on their experience, they developed a guide to organize this type of events. The planning stage is very detailed, with around four different committees, logistics, communications,

TABLE 2 Swapping initiatives used as case studies

Initiative	Picture	Location	Frequency	Type of organizer	Fee	Avg. participants
A		Bogota, Colombia	Twice per week	Individual	Yes	10
B		Bogota, Colombia	Intermittent	Individual	No	40
C		Yopal, Colombia	Twice per year	Organisation	No	80

entertainment, and data collection. Each group has specific tasks and they meet periodically before the event. The events are planned to happen during dates that are commercially important, that is, when people are expected to shop like Mother's Day or Friendship Day, so consumers have an alternative to buying. On the swapping day, the event works in a similar way as Initiative A, volunteers receive and examine the clothes and give tokens in exchange, and others organize the clothes in a space that looks like a store. Although people are giving their clothes, artistic performances are happening as well as a fair with local sustainable products for sale. People can start choosing clothes 2 hr after the event started. If two people choose the same garment, they are expected to solve the conflict by playing "stone, paper, scissors." After the event, the organizers prepared a video to share in their social networks.

4.2 | Interviews

We conducted 14 in-depth interviews, two of these interviews were dismissed because answers were too short, and interviewees did not answer all the questions asked. The interview questions were developed following the three elements described in the theoretical section of the paper: elements of the practice, interactions between elements, and recruitment. In addition, some background information about experience and personal characteristics were asked. Table 3 summarizes the information about the interviewees. Initiative C has more participants as it was the bigger one in terms of people participating. The interviews were conducted during February 2018 via Skype and over the phone. In-depth interviews were chosen as they are an efficient form of collecting information. They allow participants to give detailed accounts of their experiences and perceptions, they let the researcher probe additional areas that arise during the

conversation and help to reduce the risk of interviewer prejudgement (Seale, 2004). This decision is supported by Hitchings' (2012) argument that individual opinions still matter when studying practices and can provide valuable information regarding their role in the practice.

The research team defined a set of questions for each type of interviewee following the theoretical framework of the study. The questions were first developed in English and then translated into Spanish by the first author, who is a Spanish native speaker. The interview guide was divided into five sections: (a) background information

TABLE 3 Distribution of informants by initiative and type of actor

Informant Code	Initiative	Role	Occupation	Gender
C010101	Initiative A	Organizer	Professional	Female
C010201	Initiative A	Participant	Digital entrepreneur	Female
C020101	Initiative B	Organizer	Professional	Female
C020201	Initiative B	Participant	Professional designer	Male
C030101	Initiative C	Organizer	Professional	Female
C030102	Initiative C	Organizer	Professional	Female
C030201	Initiative C	Participant	Community leader	Female
C030202	Initiative C	Participant	Professional	Female
C030203	Initiative C	Participant	Professional	Female
C030204	Initiative C	Participant	Professional	Female
C030301	Initiative C	Participant	Business owner	Male
C030302	Initiative C	Partner	Professional	Female

about previous experiences with swapping; (b) questions about materials involved in the practice; (c) competencies, rules, and skills; (d) meaning and imagery; and (e) reasons for recruitment or defection. Interviews lasted between 30 and 45 min. They were recorded after the participants provided written consent. Interviews were transcribed in the original language.

4.3 | Data analysis

The data were analysed following an interpretative approach using an iterative reading of the transcribed interviews (Kinsella, 2006). Transcribed interviews were coded by the first author based on the interview questions, significant statements, and meaning units. Significant statements refer to what the participants express in relation to their experience of the swapping activity, on a personal level. These statements were then grouped under wider sets of information that called meaning units by Creswell (2014) or themes Saldaña (2009) using NVivo 11 and 12. These themes were then organized and cross-analysed following the concepts presented in section 3.

5 | FINDINGS

In this section, we present our findings organized by the topics presented in the theoretical framework. First, we describe the purpose of the practice from the practitioners' perspective, we then move to describing the practice of swapping as an entity, that is, the elements involved in it. We continue with a description of the practice as performance, including the perspectives of the different practitioners (organizers, participants, and partners). In the last section, we describe how the practice recruits practitioners using the insights from the theory.

5.1 | The purpose of clothe swapping

First, we identified the purpose behind the practitioners' engagement with the practice. Regarding organizers, three main reasons emerge: first, a concern for the environmental and social negative impacts of the textile industry and the lack of sustainable options in the local market; second, the need for innovative approaches to promote sustainable consumption in an institutional environment. Participants also had different reasons for taking part in the clothe swapping events. On the one hand, people were looking for different clothes for themselves or their families, either because they had too many clothes or because they did not have enough money to buy new clothes as expressed by an organizer: "I feel that there are two types, on one hand are the [people] that are aware that their closets, and in general them, have things that they do not use and that others may need. On the other hand, there are other people that, for example, really need to exchange because they do not have money." (C030102). On the other hand, participants did so for business reasons. For example, a designer used the swapping events to find materials for his products and an entrepreneur used it to find inventory to sell online through her online store. A third purpose was connected to a more charitable objective to find clothes for incarcerated children who were soon to be released and needed clothes:

5.2 | The elements of clothe swapping

When using a social practice perspective, a logical next step is to understand what the elements of the practice are. Based on the concepts offered in Section 3, in this section, we describe the materials, the meanings, and the skills and rules involved in clothe swapping. As illustrated in Appendix A, we found three types of materials that were relevant in the swap: the clothes, the place where the event happened, and the tokens used to control the exchange. Regarding clothes, participants indicated that they were mostly women's clothes, specifically dresses, shirts, pants, and jackets as illustrated in

FIGURE 1 Initiative C Source: Natalia Roa Lopez © [Colour figure can be viewed at wileyonlinelibrary.com]

FIGURE 2   Initiative A. Foto: Camila Moentres © [Colour figure can be viewed at wileyonlinelibrary.com]

Figures 1–3. Underwear, shoes, and bathing suits were not swapped because people were not allowed to bring them. The items brought should be in good shape to enter the swap. Less than ideal garments were accepted in all initiatives and were donated to local charities. Participants were informed about this before they gave up their clothes. The place had a prominent role in the event, from the perspective of the organizers. Two initiatives used public spaces from partners that were not originally used for clothes exchange. However, they rearranged these spaces to simulate a clothing store. In addition, the organizers integrated decorations that informed participants about the motivations behind their initiative. One initiative uses the organizer's private space, which is conditioned every time the event takes place.

The second element of a practice are the skills and competence required to operate the materials, perform the practice, and evaluate the outcome. In the context of initiatives analysed, we identified three aspects associated to this element. First, organizers need to be able to set up the swapping event with the support from their partners. Thus, skills for securing sponsors, partners, and volunteers are needed as well as for planning, management, marketing, and logistics. In the case of one of the initiatives, they set up committees to work on each of these issues. Organizers for the other two initiatives had to have all these competencies themselves. In addition to these organizational abilities, organizers needed to have knowledge about the environmental and social impacts of the clothing industry to illustrate the benefits of the initiative. Participants needed skills and knowledge for deciding what items to take to and from the swapping, and what in general constitutes a good swap. Such knowledge includes quality, size, and fashionability. Volunteers working at the reception of the clothes also needed skills to use the criteria to decide what clothes could be swapped and which ones should be rejected. Once the practitioners choose the clothes from the event, they should prepare them for use, for example, wash them or mend them if needed. The final aspect within this element are the rules as described by Gram-Hanssen (2010), which in these cases were created for selecting the clothes

and for behaving during the event. As mentioned above, underwear was forbidden from all initiatives. Participants were required to bring clothes in good shape. Initiative C developed rules for participants during the exchange addressing the scenario where two people wanted the same item.

The third element of a practice is the meanings and images they evoke. We found that swapping in this context evokes both negative and positive images and meanings. First, it reminded participants of old exchange practices between indigenous communities and peasants, "When someone talks about swapping it reminds me that it was mainly done by Indians, indigenous peoples sorry, to trade chicken for cassava." C020201. Second, it is also associated to the type of activities "hippies" would take part in: "Most of the people that bring such concept (swapping) [are considered] hippies, pot-heads. Logically, because this is a very conservative region." C030202. These images translate into negative and positive meanings; for example, images about indigenous and farmer societies have a positive meaning associated to community building and cooperation. Nonetheless, because past communities are also regarded as poor, this meaning transfers to the practice. The image of bohemian and hippie has a positive meaning because it is considered cool and an expression of cultural advancement. However, for people with more conservative values, it means people with low income, low social status, and cast outs as expressed in the quote above. Finally, acquiring and using second-hand clothes connect images of newness or oldness. On the one hand, some participants view swapping as a novel activity in their local context, bringing diversity. On the other hand, people see second-hand products as being dirty, contaminated by previous owners, a sigh of poverty and lack of means as the result of historic conditions. As explained by one interviewee, in the early 1900, in the capital city, the second-hand market for clothes was located in the Plaza España, next to a public hospital. It was a tradition to sell the belongings of people that had passed away in this market at a discount price for poor people. This knowledge has been passed on from generations as illustrated by this quote: "Before it was thought that second-hand clothes were for

FIGURE 3 Initiative B. Source: Facebook [Colour figure can be viewed at wileyonlinelibrary.com]

poor people and for people that had to go to the Plaza España to buy." - C020101

5.3 | Performing clothe swapping

A practice emerges, transforms, and perpetuates because its elements interact (Shove et al., 2012b). Based on the data collected and analysed, we identified three dual interactions between the elements that seemed to address the concerns about the activity. First, from material to meanings, we found that the place and the selection of clothes were done in order to counterbalance negative meanings. Organizers selected and furnished and decorated the places so they would evoke meanings of coolness and sophistication as opposed of poverty and low status. In a similar way, clothes from recognized brands were favoured by organizers as another way to avoid negative meanings. From meanings to materials, messages were posted in the event location conveying new meanings for clothe swapping and consumption related to community building and sustainable consumption. The second set connects skills and materials. By intervening the space creating fitting rooms, the organizers help participants to reduce the

uncertainty when selecting clothes. Additionally, by having people filtering the clothes, the organizers also helped participants in this direction. Rules were also established by organizers explicitly controlling the type of clothes acceptable in the event. The last set of interconnections links skills and meanings. Participants chose what they brought to the events based on their own perception of what would be desirable and how frequently they used their garments. Because of negative meanings associated with second-hand regarding hygiene, some participants washed the items they got from the event at home, although others reported that the garments they got did not need to be cleaned. Finally, organizers offered awareness-raising sessions such as workshops, presentations, and documentary screenings that reinforced positive meanings associated to the event in terms of community building (initiative C) and environmental impacts (initiative A and B).

As pointed out by Røpke (2009), another aspect that is important when exploring practices is the interactions between practitioners. Although some practices can be performed by one person, in the present case, different actors intervened in the swap: organizers,

TABLE 4 Type of practitioners and purpose of participation by initiative

Type of practitioners	Initiative A	Initiative B	Initiative C
Organizer	Individual, part time, woman, and professional	Individual, part time, woman, and professional	Two local organizations, focused sustainability, and community empowerment
Partners	No partner	No partner	Community based movement supporting sustainable consumption initiatives and local businesses
Participants	Mostly women, for personal use, and designers looking of items for upcycling	Mostly women, for personal use, and entrepreneurs looking for items to resell	Mostly women, for personal use, and professionals looking for items for charity purposes
Indirect participants	Charities that got clothes donations	Charities that got clothe donations and resell business customers	Charities that got clothes donations, vulnerable children

participants, and partners. Table 4 illustrates the type of practitioners for each initiative.

These actors interacted during and after the events. A first connection links organizers and partners who must negotiate the aim of the event, the logistics, the rules, the messages, and expectations to be raised. The second connection happens between organizers and participants. Organizers decide what clothes are worthy of being exchanged. As a result, organizers have some advantage over participants regarding the clothes. In one case, as explained by an organizer, volunteers used this advantage to save the best clothes for themselves and they were organizing the items. The organizer further explained that they addressed such unethical behaviour in an internal meeting and made it explicit that it was a form of corruption and therefore, unacceptable. Third, participants also interact among themselves by negotiating who would get a garment in case two or more wanted it. Finally, and as mentioned above, there are indirect participants, the charities that get the unwanted clothes from the organizers, the customers of the entrepreneurs, and the vulnerable populations for which some participants were selecting clothes.

5.4 | Recruitment and defection

As described in Section 3.2 for practices to survive, they need to recruit practitioners, who must reproduce the practice. The first aspects that influence recruitment, according to the literature, are personal histories, capital, and the practitioner's social networks. For each initiative we asked organizers what was their audience. Initiative A was targeted at environmentally and socially aware people. According to the organizer, participants from different social and economic backgrounds joined the initiative, but mostly from the capital city. In terms of geographic location, the initiative happens in a traditionally wealthy neighbourhood, near public universities, and the city centre, but it attracts people from other cities interested in sustainability. Initiative B's main audience are young women, with middle to high income. The events are organized in different areas of the capital city to "avoid the idea that [swapping] is only for low income people." Finally, initiative C occurs in a smaller city that has been the epicentre of oil production in the country. As a result, income is high as it is inequality. Therefore, the initiative has attracted two types of people, those that have too much stuff and want to get rid of it, and the people that cannot afford new clothes. In this case, women are the main audience as well, although it was reported as a family activity: "I decided to participate in the swap for my daughter, because I wanted her to know the event. Additionally, it has become an amazing cultural event. Lately, they have given it a gastronomic twist, thus I think it is very important." C030203

The ability of a social practice to recruit practitioners depends on how socially significant it is. Participants expressed different perspectives regarding how clothe swapping is perceived by their networks. In the case of initiative A, on person said that her family and friends do not approve of using second-hand clothing; thus, she is challenging her peers, which in turn can undermine her interest in reproducing the practice. For the participant interviewed about initiative B, clothe swapping reaffirms his commitment to more efficient use of

resources, making it easier to join. Finally, as illustrated in the paragraph above, the interviewee from initiative C indicted that she sees the event as an opportunity to educate her daughter and to do something different during their free time.

The level of exposure to a practice or how embedded it is in a person's everyday life is also an aspect that influences the ability of the practice to recruit practitioners. According to the organizers of the initiatives, dissemination is the most challenging aspect of it. They mostly use social media and traditional media to help people learn about the event. Word of mouth has also been a good way to connect people. However, because of the nature of the initiatives, voluntary, and free, organizers have scarce resources to increase the level of exposure. Lastly, how a practice connects with other practices also contributes to its capacity to recruit. According to participants, clothing swaps connect with practices of working (reselling and designing), donating (charity organizations) and socializing.

6 | DISCUSSION

The purpose of this study was to provide insights into why people in emerging economies participate in collaborative consumption practices such as clothe swapping by using a social practice perspective. As shown in the findings, by using this perspective, we were able to explore the elements involved in clothe swapping. We also identified the interactions between these elements, which allowed the practice to emerge. Lastly, using a practice approach allowed us to recognise the conditions that favoured recruitment of practitioners into this practice. In contrast with previous research, where the main purpose was to isolate factors and motives driving individual consumers to participate in such events, we were able to provide a rich description of how clothe swapping comes about. We achieved this by exploring the connections between tangible aspects such as materials and people with intangible ones such as images, meanings, skills, competence, and other practices. By exploring these questions, this research provides potential areas of intervention for designers, governments, local organizations, and business, if they are interested in promoting these or similar practices.

Although none of the available studies on clothe swapping use a practice perspective, some of our findings confirm previous results from the literature. For example, Albinsson and Perera (2009, 2012) indicated that the characteristics of the items were important for participants. In our study, quality aspects were also relevant; we found that brand and newness were favoured by participants as they reduced the risk of choosing wrongly. Another aspect elaborated by the authors and by Gatti (2009) refers to how these events help building and strengthening a sense of community. In one of the cases explored here, the practitioners argued that by engaging with the practice, they strengthened their bonds with their networks.

An interesting finding that is not reported in previous research is how some of the rules established for the exchange could work against the general purpose of the initiatives. In our study, all cases indicated that only "good quality" clothes would be accepted for

exchange. Clothes that would not be accepted, those of "less quality" would be donated to charities and vulnerable communities. This implies that these groups, charities, and vulnerable communities do not deserve the good quality clothes but less quality. However, one of the purposes of these initiatives is to promote sustainability, solidarity, and community values through the swap. Nonetheless, these rules are reinforcing the image that vulnerable and poor people deserve less quality, which goes against equality and solidarity. Schor et al. (2016) explored a similar aspect in the context of sharing economy initiatives such as maker spaces, finding that cultural capital was used to make distinctions between participants. In this sense, it could be important to further explore the relationship between inequality and collaborative consumption practices. Also interesting was the finding about the other practices connected to the clothe swapping. The initial assumption is that people use these events for personal and direct benefit, that is, to find clothes for themselves or their family. However, we found that people have other purposes.

Nonetheless, this study has several limitations that should be addressed in future work. First, it is limited to a specific socio-economic context, an emergent economy. It would be interesting to have similar studies in other contexts to see how the practice is implemented and how it recruits practitioners. As opposed to existing research, it does not dive deep into individual aspects that are also relevant especially when exploring first encounters with the practice. It only explored the reasons how the practice is configured and why people are attracted to it and join it, not why do they stay within it or defect. Finally, the analysis based only on interview and visual data, which proved to be rather rich as suggested by Hitchings (2012). However, nonparticipant observation can help expand insights, especially regarding people's interaction with the materials and infrastructure and other people.

7 | CONCLUSIONS

Overall, our findings indicated that participation in clothe swapping involves complex interconnections and interactions that, sometimes, have undesirable results that go against the spirit of the initiative. Moreover, it allowed us to better understand why people have a positive disposition to take part in the practice, beyond their personal internal characteristics. Organizers of clothe swapping initiatives should be aware of the images and meanings associated to the materials and infrastructures involved in the exchange, and use codes, rules, and find skills to alter them towards a desired state that favours the practice. However, and based on the findings, more reflection about the impacts of their decisions regarding the different elements could help avoid undesired outcomes and reinforce desired ones.

Our research suggests that using a practice perspective offers several advantages when addressing questions of acceptance and adoption of circular practices such as clothe swapping. On the one hand, it offers an expanded perspective of the topic, moving beyond the individual as the practice is taken as unit of analysis. As a result, it presents a description of the different elements involved in the practice and the

interactions between such elements, including people. By doing so, it acknowledges the relevance of the context and provides information about potential areas of intervention for multiple stakeholders. By exploring interactions between elements and between people, this approach allowed us to identify paradoxes that should be avoided.

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APPENDIX A

Materials Involved in the Clothe Swap

Type	Description	Quote
Clothes	• Mainly women's clothes as most participants were women. • Most frequently swapped items were dresses, shirts, pants and jackets. • Underwear was forbidden by all initiatives. • Special items such as costumes and baby clothes were also exchanged on at least one occasion in two of the initiatives. • Interviewees reported that they mostly brought and found clothes in good shape. • Brands were an important aspect of the clothes being swapped as people preferred known names.	"So, the idea is that [clothes are] high quality, thus the filter aims at that, by checking them and decide what is accepted in the swap shop and what doesn't. If it does not, they tell the person." C030101
Place	• Alternative places like schools, hotels, cafes, co-working offices and private homes were used to organize the events. • Organizers mentioned the importance of making the space attractive and looking like a store. • To achieve it, they used equipment and accessories typically used in clothing stores (exhibition racks, mirrors and changing rooms). • Organizers added visual aids to convey messages of sustainability and community. • Two of the initiatives combined the swapping event with a trade fair for second-hand and eco-products.	"At the moment it is [in] my house. The project cannot subsidize a space completely. What we do is that the day that is open to the public, which are Wednesdays and Saturdays, that day the project pays as if the space was rented." C010101
Tokens	• Two initiatives used tokens to facilitate exchange. Each token was equivalent to one item, independently of its commercial value.	"It's with chips, it's not like I have this, and you give me this, I organize [the swap] using chips." C020101

APPENDIX B

Skills and Competence Needed for the Clothe Swap

Type	Description	Quote
Event organization	• Organizers needed to secure sponsors, partners, and volunteers for the event. • The events required planning, management, promotion, marketing, and logistics skills for organizing each event. • Additional knowledge about the environmental and social impacts of the clothing industry was also needed.	"What I want to do this year is to organize myself, decide where the Project is going so, I can find sponsors." C020101 "We have to work a lot with our social networks and I usually go to universities looking for the opportunity to give conferences and similar things." C010101
Selection of clothes to bring and take	• Organizers needed to filter clothes based on quality and fashionability.	"We meet with my family and I tell them: ok, there is a swapping event this day. So, we start to gather the clothes that we do not use anymore but is still in excellent condition. I usually bring dresses and my parents also bring their clothes." C030202

(Continues)

Type	Description	Quote
	• Participants needed knowledge and skills to decide what items to bring to the event. • During the swap, participants needed to be able to assess if a given item would fit them and if it would need significant intervention to make it usable.	"If you look for one specific size you will have les options. But if you are looking for any size, you have more options." C010201
Preparation of clothes for use	• Once people took the items they chose and went back home, they needed to decide what to do to them before using them (i.e., cleaning and mending)	"[The clothes] were clean, however I washed them before using them." C030201
Rules for bringing clothes	• Organizers developed rules for what type of clothes were acceptable for the swap. • Unacceptable clothes could be donated to local charities.	"Their first time, [people] bring items that are not good [so] first, we do not accept them and then we explain that if they want to get something good, they need to bring something good themselves because that keeps the event happening." C020101
Rules for behaving at the event	• During the event, one initiative provided specific guidelines for participants about behaviour during the exchange (e.g., solving conflicts). • Organizers developed guidelines for volunteers participating in the event to avoid unethical behaviours (e.g., not to take any clothes for themselves).	"In the case that two people want the same garment, they need to decide who gets it by playing stone, paper, scissors. Two out of three. This is one of the rules." C030101 "It was decided, in addition, that these volunteers, who are organizers and filter items, cannot take part in the event." C030102

APPENDIX C

Images Associated With Clothe Swapping

Images	Meanings	Quote
Indigenous and peasants' communities	• *Positive:* It is a traditional form of trade that enabled community building. • *Negative:* It is an activity that poor societies performed, not advanced ones.	"When someone talks about swapping it reminds me that it was mainly done by indians, indigenous peoples sorry, to trade chicken for cassava." C020201
Bohemian/ "Hippie"	• *Positive:* These initiatives are cool, are an expression of cultural advancement • *Negative:* Poor people with no means to get new clothes use swapping events. These events are organized by drug-addicts and cast outs.	"Before it was thought that second-hand clothes were for poor people and for people that had to go to the Plaza España to buy." C020101 "Most of the people that bring such concept (swapping) [are considered] hippies, pot-heads. Logically, because this is a very conservative region." C030202
Newness	• *Positive:* It is perceived as an innovative activity in the local context. • *Negative:* Second-hand clothes are dirty, contaminated by the energy of previous owners. It is a sign of poverty and lack of means.	"The idea of participating in the initiative came about because I started to recognize the organizers through my brother's friend, and I got interested because it was something new. […] When they started doing this, […] they began to change people's way of thinking." C030301 "So, sometimes […] there are too many things that are not laid out properly and they smell funny, or that is the impression that you get, so they do not seem that cool." C010201

APPENDIX D

Practices as Performance: Interactions Between Elements

Interaction	Description	Quote
1. Material → Meanings	Place chosen to evoke ideas of sophistication and coolness to counterbalance the negative meanings associated with second-hand clothes.	"the idea is to overcome the cultural barrier or belief that swapping is something 'hippie' and something primitive and instead communicate the idea that it aims at salvaging traditional economic practices. That is why I try to find places that are cool, beautiful, that have different meanings." C020101
	Organizers favoured high-quality clothes from recognized brands, as they seem to be regarded better by participants.	"To tell the truth, when I go to check out Initiative A, I pay attention to the brand [...] it is an issue of trust. Brands provide support; people know how a specific brand looks on them." C010201
2. Meanings → Materials	Organizers put up signs in the swapping space communicating the environmental impacts of clothes consumption.	"We always decorate the place with messages made in with recycled materials, cardboard, made by ourselves." C030101
3. Materials → Skills	To allow participants to better assess the garments they want to take, organizers set fitting rooms.	"So, I take the items I think fit me, I go to a fitting room and try them on." C030201
	By having people filtering participant contributions, organizers also assisted in the decision of which clothes to exchange	"I place someone at the door and give them the indications about what items are suitable. Garments that are in good shape, clean that do not stink, items that are apt for someone to take them home." C030204
4. Skills → Materials	Some organisers established explicit and specific rules to guarantee that the clothes available in the event were suitable for exchange.	"And the rules are very clear, the clothes have to be in good shape, and that we have to wait until the end of the afternoon to do the swapping." C020201
	Initiative C set specific guidelines for vendors participating in a parallel activity. These rules specified the type of products they could offer (local food, crafts) and banned single-use plastic products.	"One of the things that we let the people selling food, is that they need to use reusable plates and cutlery and not single-use plastic products, for example." C030101
5. Skills → Meanings	Participants chose what they brought to the events based on their own perception of what would be desirable and how frequently they used their garments.	"[...] if it is clothes, [I choose] clothes that I do not wear any more or that my family does not use and clothes that I know other people will like and wear. Secondly, [clothes] that are in good shape." C030202
	Because of negative meanings associated with second-hand regarding hygiene, some participants washed the items they got from the event at home, although others reported that the garments they got did not need to be cleaned.	"We have used items right away because we perceive them as super clean, they do not smell like sweat and are very well conserved." C020201
6. Meanings → Skills	Organizers offered awareness-raising sessions such as workshops, presentations, and documentary screenings that reinforced positive meanings associated to the event in terms of community building (initiative C) and environmental impacts (initiative A and B).	"[the time between the moment people give their clothes and they get to choose the ones they take] is the moment I use to give the lectures or show documentaries, or create other type of activities [...] so people start to understand why it is important to organize this type of events." C020101

APPENDIX E
Recruitment Into the Practices

Aspect/Initiative	Initiative A	Initiative B	Initiative C
Personal histories, capitals and social networks	Our target audience is people environmentally and socially aware. We have realized that these people do not belong to a specific economic class. They do not live in a specific area of the city or have a certain education level. C010101	The city is divided in social classes, so I like to go to different areas [of the city] to avoid the idea that [swapping] is only for low income people. With the clothes [swapping] I have realized that women between 25 and 40 are my target audience. But I don't know, I have not decided on a specific type of people. They are mostly women, but I have tried to bring men C020101 A friend went, she liked the dynamics, but it has been a bit difficult because she has a hard time detaching from things. C020201	I feel that there are two types, on one hand are the [people] that are aware that their closets, and in general them, have things that they do not use and that others may need. On the other hand, there are other people that, for example, really need to exchange because they do not have money. The people swapping range from three to 64 years old, mostly women C030102 I know a lot of people that has participated because we have invited them. [...] Many people are afraid. Many people say that they will go but then they don't because it is second-hand clothes. Here, let's say, there is not a swapping culture, everything must be new. In Yopal, the culture is a bit materialistic and sexist. C030202
Social (cultural and legal) significance	My friends and cousins, for example, do not think they would wear something from someone else. My boyfriend tells me the same. They do not know who that person is, even if the item is in perfect shape. They would not wear second hand clothes. C010201	When we read the website of [initiative B], it caught our attention because it mirrors what we have been doing, creating awareness so people do not discard clothes so fast, and instead they try to keep it longer, and transform it into something special. C020201	I decided to participate in the swap for my daughter, because I wanted her to know the event. Additionally, it has become an amazing cultural event. Lately, they have given it a gastronomic twist, thus I think it is very important. C030203
Level of exposure to the practice	That is one of our main challenges, dissemination. At the moment, the idea is to create a dissemination campaign for social networks. [...] some businesses are willing to start an activity with their employees. C010101	We have told people from the neighbourhood to not miss this opportunity. C020201 I think here it is important that there are people that are influences or famous and start talking about sustainability. C020101	Well, we have focused on inviting people using traditional media like radio and through fan pages, and to be honest it has been good. C030101 I think, what we think, is that there is a need for appropriation, for example, organizations need to commit to organize an event at least once a year, it would be enough. C030102
Connection to other practices	I attend the swap to Exchange the things I can't sell [in my online store]. What doesn't sell I bring it to the swap. I also help [the organizer] sell clothes online. C010201	The ones that are more interesting for me, I take them apart immediately and I rescue as much as I can to use it in a [design] project. C020201	If there are garments with some defect, they put them away and bring them to a charity. A charity or some organization that really needs those clothes or items. C030201 One had the possibility to drink something and share with people. The first time I went I didn't know anyone, so it was cool because it made me set my shyness aside and try to take away that tendency humans have to isolate themselves. C030203

PAPER 4

Camacho-Otero, J. (2019). Consumption in the circular economy: expected consumer behaviours and activities. In J. Segalàs & B. Lazzarini (Eds.), Proceedings of the 19th European Roundtable for Sustainable Consumption and Production Circular Europe for Sustainability: Design, Production and Consumption. Barcelona.

Purpose: To investigate extent at which participating in a circular value proposition implied a more complex interaction between user and provider.

Methods: Empirical data was drawn from 123 user-generated online reviews about three fashion subscription services working in an industrialized country. Data was qualitatively analyzed using tools from the service design field.

Results: Participating in an access-based form of consumption in the clothing sector can be conceptualized using a six-moment process. Users perform actions related to the acquisition, appropriation, appreciation, devaluation, divestment and disposal of both the product and the service components of the value proposition.

Contribution: From a methodological perspective, through exploring the user journey, the study provided a detailed and chronological account of the user actions involved in the consumption of the circular offering. This tool allowed for the distinction between the product and the service component. However, because it is in principle linear, it proved difficult to map the circular dynamic of the offering. From a theoretical perspective, this study showed that an expanded understanding of consumption, that puts more importance to the use phases by disaggregating them, can help better understand how circularity effects on consumption.

Consumption in the circular economy: consumer behaviours and activities

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Abstract

Despite the central role consumers will play in achieving circularity, research on the effects of circularity on consumption is somewhat limited. Instead, most of the existing studies addressing the circular economy identify strategies and business models that companies should implement to become circular without considering the consequences on the demand side. By omitting the consumption perspective, circular economy design and development processes will result in offerings that consumers will not adopt. To contribute to the literature on consumption and the circular economy, and to improve the understanding of such issue, this study investigated the actions involved in the consumption process of a specific type of circular offerings. To address this aim, the study draws on the fields of service design and consumption studies, to analyse data from three case studies offering use-oriented product-service systems in the fashion sector. Based on the qualitative analysis of the data, the study found that the consumption process involving circular offerings, does not only change what happens during the acquisition or disposal moments, but it also requires actions that enable the appropriation, appreciation, devaluation and divestment of the offering. Such actions are different for the tangible or intangible aspect of the offering. Each of these moments, offers an opportunity to design and develop offerings that account for the user's experience, and if done properly, can deliver real value for the customer. Some interesting findings suggest that this type of offering may contribute to inequal access to clothes by favouring people that have access to digital and credit infrastructures. Data also suggest that people can derive several benefits, including symbolic, economic, and functional ones. Nevertheless, users are expected to give up sensitive information, and control. Future research can broaden the scope of data sources to populate some of the insights offered here. Moreover, it is suggested that new studies focus on how circularity influences each of the components of use-oriented PSS in different sectors.

Keywords: circular economy, circular consumption, consumer behaviour, service design

1. Introduction

Since 2014, various businesses endorsing the circular economy have been recognised and praised for their potential contribution to a successful transition towards the circular economy in high-level economic events such as the World Economic Forum. However, a quick screening of their value propositions reveals that customers play a critical role in realising their circularity potential. Nonetheless, in the absence of the right incentives and conditions, people will not act in the expected way (Ajzen, 1991). In a linear economy, consumers are the endpoint in a company's value chain, and because of it, companies direct all their resources to get consumers to purchase their product or service. In contrast, in the circular economy, consumers are not the endpoint anymore; they become product and material stewards, changing the relationship between company and consumer.

Despite the relevance of consumers and consumption in the circular economy, most literature available analyses how production processes and business models change in this new context (European Commission, 2017; Van Eijk, 2015; Wijkman and Skånberg, 2015) and provide guidance on strategies to achieve such transformation

(Linder and Williander, 2017; Moreno et al., 2016). Focusing primarily on the production side can have two consequences. On the one hand, it can reduce the intervention landscape for the companies, and on the other, it may hamper the chances of delivering real value for consumers (Kirchherr et al., 2017).

In an effort to tackle these limitations and with the aim of further contributing to improving the understanding of the circular economy from a consumption perspective, this study investigates the actions that are performed by customers of circular offerings to realise their circular potential drawing on social practice theory and its definition of consumption, and using service design mapping tools for identifying the user journey. To realize this aim, an empirical was conducted to analyse the value propositions of companies implementing these offerings. The paper is divided into five sections. After this first introductory section, I develop the conceptual framework used to guide the study. Based on the theoretical approaches, I present the materials and methods for the study in section 3. In the following section, I introduce the findings and discuss them. In the final section, I share some concluding remarks.

2. Conceptual framework

a. Circular economy and offerings

According to the Ellen MacArthur Foundation (2013b) proposal, the economy is divided into two cycles, the biological and the technical. Different actors participate in the value chain and activities associated with them. Such activities must be implemented following a set of principles the Foundation derived from such fields as Industrial Ecology and the schools of Biomimicry and Cradle to Cradle. More recently, other authors have provided more academic definitions, that suggests that a circular economy requires economic activities to be restorative of and decoupled from material use (Ellen MacArthur Foundation, 2013b; Roos, 2014; Webster, 2013).

Following Bocken et al. (2016), a circular offering solves a problem at the same time it contributes to the closing, slowing or narrowing of material flows (refer to Table 1). The Ellen MacArthur Foundation (2013) suggested that re-use, maintenance, remanufacturing, recycling and cascading activities contribute to this purpose. Based on their own definition of the circular economy, Accenture (2014) suggested five solutions that can be considered circular: circular (circulated) supplies, resource recovery services, services for product life extension, sharing platforms and product-service systems. Later and building on Ellen MacArthur Foundation (2015), Lewandowski (2016) proposed, that circular business models are based on four types of offerings: products enabling life-extension, product-service systems, virtualised services and collaborative consumption. In a more recent proposal, Rizos et al. (2017) identified three types of processes, offerings that use fewer primary resources, that maintain the highest value of materials and products, and offerings that change utilisation patterns, such as product as a service, sharing platforms and shifts in consumption patterns.

Table 1 Circular business and product design strategies. Based on Bocken et al. (2016)

Circular business strategy	Strategy	Offering
Closing material loops	Extending resource value	Recycling products
Slowing material loops	Access-based	Use and Result oriented Product Service Systems Sharing platforms
	Extending product value	Remanufacturing products, consignment stores, swapping

	Classic long-life model	Product-oriented Product Service Systems
	Encourage sufficiency	High-end premium products

The extent to which different types of business models contribute to resource efficiency is a matter of discussion (Vita et al., 2019). In their work, they evaluated the environmental impacts of a wide range of sufficiency and green consumption practices. From their model, the authors estimated that only practices that reduce fashion consumption could significantly reduce environmental impacts, rather than only changing materials. Other authors have embarked in assessing what are the savings resulting from the implementation and adoption of such business models. For example, Iran and Schrader (2017) discussed the different paths through which collaborative consumption models in the fashion industry can support resource efficiency. They suggest that they can contribute to efficiency by intensifying utilisation of products, although as any efficiency gain, it can be subject to rebound effects. Collaborative consumption can also help if a sufficiency effect results from its implementation, i.e. fewer items are demanded. This finding is supported by Farrant et al. (2010) in their life cycle analysis of reusing clothes.

b. Circular consumer behaviours and consumption

Some authors like Hobson (2016), Mylan et al. (2016) and Selvefors et al. (2018) suggest that the circular economy can, and should be approached, not only from a production perspective but also from a consumption one. In line with this argument, Wastling et al. (2018) explored the user behaviours required for the transition to a circular economy focusing on three different types of PSS, based on Tukker (2004). They used their findings to develop a framework for designing products and services that encourage desired circular behaviours. As a first step, they identified a series of desired behaviours for PSS in which the provider owns the product, and the user owns it. They analysed the behaviours for two stages in the consumption process, use and end of use as illustrated in Table 2.

Table 2 Desired circular behaviours. Based on Wastling et al. (2018)

Consumption phase	Use and results-oriented PSS	Product-oriented PSS
Use	Adhere to contractual obligations	Establishing a relationship
	Product care	Product care
	Engage with product life extension services	Repair
	Provide information	Engage with product life extension services
	Avoid product misuse	Product attachment/ownership
	Avoid damaging behaviours	
End of use	Fast circulation of goods	Prolong replacement
	Reducing operating costs	Return product
		Sell (via a third party)
		Enable reuse
		Correct disposal/recycling

More recently, Selvefors et al. (2019, 2018) explored what the user perspective on product circularity entailed for design and elaborated a framework to guide designers. In contrast with Wastling, the authors focus more on the definition of consumption and suggest how such understanding can reframe the production-oriented narrative of the circular economy. They suggest consumption is a three-parted process as opposed to one focused only on the purchase of products. Their consumption process is divided into obtainment, use and riddance stages. Products

can be accessed or owned. Access can be gained through co-using, borrowing, renting, subscribing, and leasing. Ownership can be obtained via receiving, trading and buying. In a similar way, users can finish co-using agreements, return products, end contracts, offer access, give them up, trade them back, sell them and bring them back. They suggest that what path consumer choose influences resources throughput. What path is chosen depends on how advantageous it is to the user, particularly considering the type of activities the given path entails. Based on this understanding, the authors propose a change in focus from the production to the consumption cycle.

These contributions bring attention to the consumer and user as an active participant in the economic system that can influence how materials and product circulate, a novel approach that is scarce in the existing literature. Although both make significant contributions to this innovative perspective, they also open space for further work. Their understanding of consumption is somehow still limited, as they see it as a two or three-step process. As it is argued in this article, consumption is more nuanced, and the resulting opportunities for intervention can be numerous. From an empirical perspective, and because their main objective was to create a design approach from a user perspective, neither of these studies had access to existing businesses and consumers involved in circular business models that could provide data to assess their suggestions.

c. **Consumption moments**

Consumption has been explored from different perspectives, including economic, psychosocial, cultural and socio-material (Halkier et al., 2017; Reisch and Thogersen, 2015). In this study, we used the extended definition of consumption offered by Evans (2018) building on Warde (2005). According to Warde, consumption does not happen for the sake of consuming but in the context of social practices. Social practices refer to the set of doings a person's everyday life is made of. Examples of social practices include cooking, showering, travelling, dressing, working, or entertaining. Warde defines consumption not only as the acquisition of objects or services, but also as the "process whereby agents engage in appropriation and appreciation, whether for utilitarian, expressive or contemplative purposes, of goods, services, performances, information or ambience, whether purchased or not, over which the agent has some degree of discretion". (p. 137)

Based on this definition, Evans (2018) suggests that the consumption cycle comprises the acquisition, appropriation and appreciation of artefacts and services as well as devaluation, divestment and disposal. Acquisition refers to how people access objects and services, for example, via purchase, leasing or donations. Appropriation involves the actions by which people incorporate acquired objects or experiences in their everyday life. Gruen (2017) suggests appropriation has the goal to transform the use or functional value of an artefact into sign value, creating a meaningful relationship with the object and it is achieved through creation, knowing and controlling practices. Mifsud et al. (2015), on the other hand, suggests that service appropriation depends on seven dimensions: service knowledge, self-adaptation, service control, service creation, and psychological ownership.

After objects and services are integrated into everyday life, people derive satisfaction or pleasure by using these artefacts or living such experiences, resulting in appreciation. Appreciation results in attachment to the product. According to Mugge (2007), four factors influence the formation of an emotional bond with a product, self-expression, group affiliation, memories, and pleasure. Schifferstein and Zwartkruis-Pelgrim (2008) suggested that product attachment is the result of the product meaning and the different types of the consumer's self. For these authors, product meanings include enjoyment, individual autonomy, group affiliation and life vision each

corresponding to a feature of the person: diffuse self, private self, public self and collective self. Table 3 presents some questions that help understand the purpose of each consumption moment.

Table 3 Moments of consumption. Based on Evans (2018), Selvefors et al. (2019), Warde (2005)

Moment of consumption	What people do	Description
Acquisition	How do people access an object?	Co-using, borrowing, renting, subscribing, and leasing (Selvefors et al., 2019)
Appropriation	How do people domesticate an object?	Creation, knowing and controlling practices (Gruen, 2017); Service knowledge, self-adaptation, service control, service creation, and psychological ownership (Mifsud et al., 2015)
Appreciation	How do people derive satisfaction from an object?	Self-expression, group affiliation, memories, and pleasure (Mugge, 2007); Enjoyment, individual autonomy, group affiliation and life vision (Schifferstein and Zwartkruis-Pelgrim, 2008)
Devaluation	Why do people stop getting pleasure and satisfaction form an object?	As suggested by Evans, and in opposition, at this moment the product or service, stops affording identity, enabling group affiliation, creating memories, and being pleasurable
Divestment	How do people grow detached from an object?	In a similar way, we can suggest that PSS users divest from it when they stop understanding the service, participating in it, and when they lose control of it.
Disposal	How do people get rid of an object?	Users can finish co-using agreements, return products, end contracts, offer access, give items up, trade items back, sell items and bring items back (Selvefors et al., 2019)

After this process of integration comes the process of expulsion, which is also relevant, especially from a circularity perspective. Devaluation, the moment of consumption, when objects and experience do not bring pleasure, joy or satisfaction, losing its value. When a phone stops functioning correctly, as it becomes slow, it loses its value. Or when a restaurant becomes too crowded, it does not provide pleasure anymore, and it becomes devalued. Once objects become devalued, the emotional bond a person develops with a particular 'product specimen' resulting from the meaning they assign to such object, beyond their utilitarian connotation, breaks (Mugge, 2007). Thus, the phone is used less, and alternative options start to be explored, and the restaurant is not visited less frequently. Finally, products and services are disposed of, and they are sent back to the phone provider or forgotten in a drawer (Ertz et al., 2017). By using these moments of consumption and the corresponding questions, I explore how circularity changes what people have to do when they consume goods.

Having an expanded understanding of the consumption process can enable for an increasing number of intervention opportunities for designers and business developers that can improve the user experience and deliver better value (Polaine et al., 2013). Because services gain a more prominent role in this new system, service design becomes a prominent tool for addressing such task as it focuses on understanding people and getting insights about their lives that can be transformed into design guidelines. By incorporating an expanded understanding of the experience, service design can nuance findings and insights. In contrast to product design, service design uses the user experience as the unit of analysis, which is the result of their relationship with the service. In this sense, the quality of the experience depends on the relationships that happen during the use of the service. In the context of the circular economy, understanding what is that experience, is critical to improve it and enable acceptance and

adoption. Thus, in this paper we used the user journey tool to map the different actions people using use-oriented PSS for clothing perform as an initial step to understanding how circularity affects consumption.

3. Methods

In order to answer the research question, how circularity influences the consumption process, I use a qualitative research design, investigating the company's and the customers' perspectives on the use journey for a specific type of circular offering, use-oriented Product Service System (PSS). Specifically, I use a multi-case study approach, analysing data from three firms providing this type of offering in the clothing sector. Case study research design allows for an in-depth evaluation of a topic (Eisenhardt, 1989; Stake, 2011). The implementation of digitally based circular offerings, especially in the fashion sector, is quite recent, which limits the knowledge available about how they affect consumption processes. Nonetheless, there are some initiatives that have successfully implemented these strategies that can provide the information to investigate such effects. Thus, these initiatives can be explored as case studies to answer the question. In the following subsections, I expand on what type of cases are used, what data is collected, and how it is analysed.
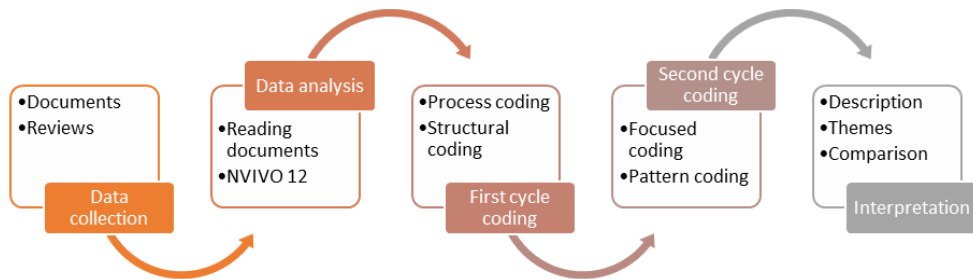

Figure 1. *Research design*

a. Case studies

Based on the definitions of circular business models, specifically use-oriented product-service systems, I looked for companies applying this business model in the fashion sector. In order to secure reliability of the inputs, I chose companies offering subscription services for clothing, founded before 2014. Younger companies may be in a consolidation stage, which prevents the service from being mature. Additionally, I chose companies providing their services online as this offers more accessible information and have a higher probability of growth than locally-based offline businesses. Considering the limited number of companies already offering this service, I followed a purposeful sampling process to choose the cases and focused on crucial cases using critical case sampling, thus selecting decisive examples from which logical generalisations can be derived. Table 4 presents a summary of their main characteristics.

Table 4 Companies used as case studies and data sources

	Company A	Company B	Company C
Company's documents	Terms of Use, Frequently Asked Questions, website	Terms of Use, Rent agreement, website	Terms of use, Frequently Asked Questions, website
User reviews	80	11	44

b. Data sources

Considering the research question and the theoretical approach, I used data from two perspectives, the company and the customers using the company's documents describing the service and, user-generated reviews describing the journey using the service. Based on such data, I identify the process followed by customers to use the circular offering. Because the research question refers to the process of using the service rather than the experience, these sources were deemed adequate. However, for future research addressing questions about why customers and company address the different stages of consumption the way they do, interviews and contextual inquiry can support deeper insights into the experience and drivers and evaluate to what extent they are connected to circularity.

All companies have been in the market for more than three (3) years with a significant customer base concentrated in the U.S. Similar initiatives are emerging in other regions such as Europe, Latin America and Asia, but they haven't reached the same level of maturity.

c. Data collection

Data was collected from the websites and online documents about the service provided by each of the companies analysed. User-generated reviews were mined in 2017 and 2018 with the authorisation of the third-party review site granted in September 2017 via email. Reviews collected were posted between January 2016 and December 2017. User-generated online reviews are a consistent source to investigate consumption-related issues as they met credibility and suitability criteria, especially when understanding the actions followed by the consumer in the context of a specific offering (Camacho-Otero et al., 2019). Other documents such as Terms of Use, Frequently Asked Questions, Rent Agreement were downloaded in December 2018 and updated on June 2019.

d. Data analysis

Data from the different sources were analysed using NVIVO 12 using a double coding process. First, data from documents and user reviews were analysed following a process coding strategy. Having the sub-questions in mind, I coded the documents and reviews using an in vivo approach. This process resulted in 211 coding units. Then, the text strings were clustered in different categories. These categories were then coded following a structural coding strategy based on the research questions and sub-questions presented in the introduction to be categorized under the different moments of consumption. Figure 2 illustrates the process of using the software.
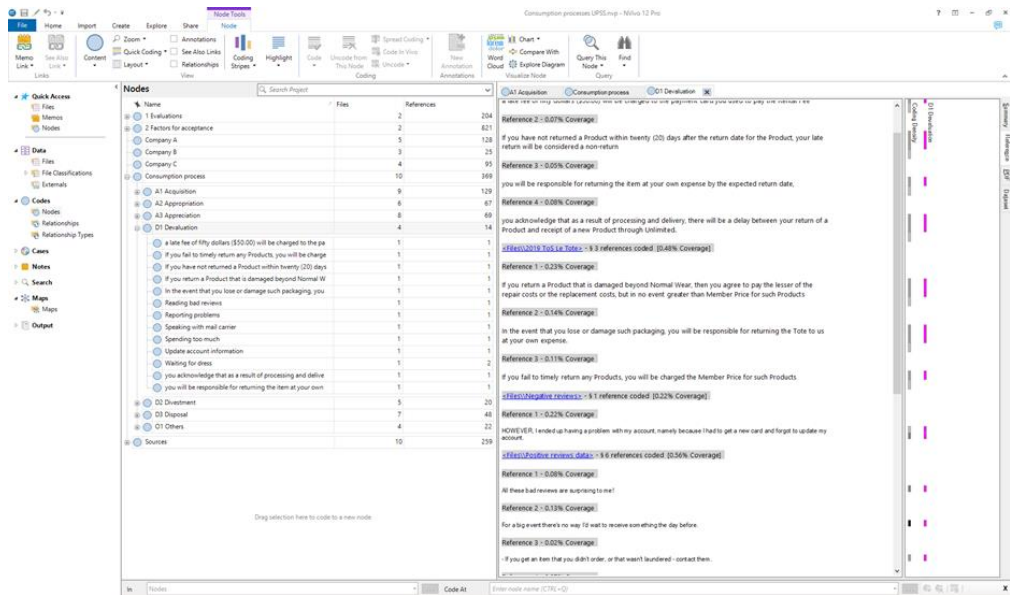
Figure 2. *NVivo 12 analysis tool*

4. Results and Discussion

a. Fashion subscription services

The three case studies offer women's clothing via short term rentals. Figure 3 illustrates the generic user journey for a fashion subscription service, according to the data collected. First, a customer needs to learn about the service. Then she visits the website or any other digital outlet they offer. None of the companies report an offline touchpoint. If the potential customer has made the decision to use the service, she needs to register with the service. Afterward, the user has to select a plan depending on the company and pay the corresponding subscription fee. Once these steps are taken, the user can choose the items she wants to get via mail. The company then sends the items. The user wears the items for as long as she wants. In order to receive new clothes, she needs to return the items, she has using a designated device. Once she returns them, the process starts again with her selecting the new items.
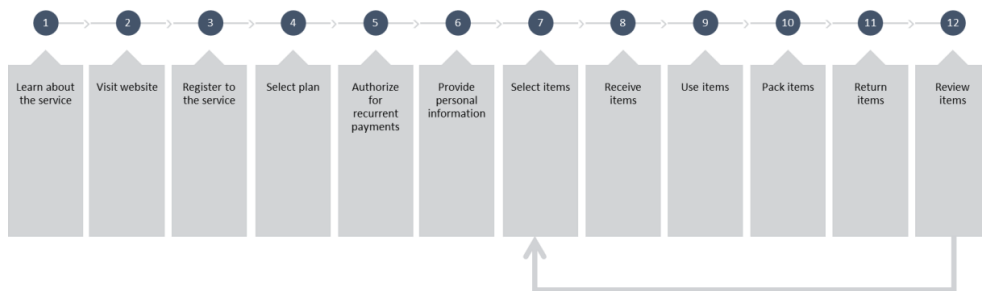

Figure 3. *Generic user journey for a fashion subscription service*

The companies studied are different in the details about these specific steps. Company A owns a stock of items which are available for subscribers. Users choose from this inventory a minimum of 25 pieces from which the company will choose what to select. Users can prioritize items and put others on hold to avoid getting them. Company B asks subscribers a series of questions to define their style and make suggestions for people to choose accessories and garments. Company C offers a subscription service that enables users to pick up to four (4) clothes from the company's wardrobe, which will be sent. For all three companies, people need to send back the items they have if they want to get new ones. There is no time limit for how long they can keep the products if they pay the subscription fee. All cases offer the option of purchasing items. Each company gives users a pre-paid bag to return items. All companies are considered digital as their primary interaction channel with the customer is digital.

b. The consumption process of use-oriented Product Service Systems

Product-service systems have two main components, the product and the service. The product refers to the material tangible part of the offering that the user has access to temporarily. In our case studies, the products are clothes and accessories. The service is the intangible part of the offering to which the user is committed the longest. The service includes the whole experience of accessing garments. Because the relationship between the offering and the user is different for both components, it follows that the consumption processes and the actions that happened in each moment are diverse as well. Figure 4 presents the different actions, users are involved when using the service from a consumption process perspective.
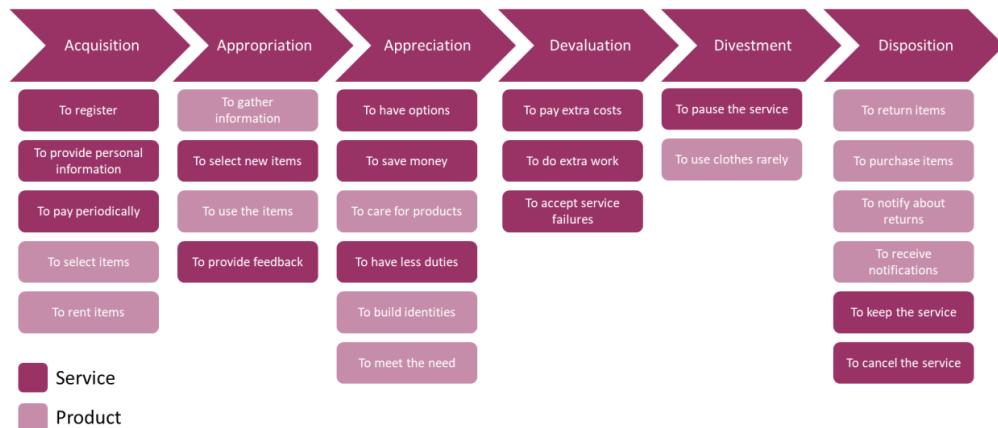

Figure 4. Actions involved in the consumption process of use-oriented PSS for clothes

c. Acquisition

In accordance with Evans (2018), consumption starts with the acquisition of the product or experience. In the case studies, items are rented on a short basis. People need to register to access the offering using a device that is connected to the internet. By implication, the service is restricted to people who have access to such devices and have the skills to use them. The registration process requires people to provide different types of information including personal such as shipping and billing address, financial information such as credit card, and information about their individual styles, tastes, and size as suggested by Wastling et al. (2018). This step can have significant

implications. On the one hand, people must offer sensitive information to the company. On the other hand, users must be part of formal financial structures and have access to credit, restricting the type of people that can use the service. Once users have completed the registration process, they must select a plan, which in turn defines the price to pay. This price is automatically charged to the credit card given during the registration step and can only be stopped by sending a direct request to the company. These steps are only performed once when the user acquires the service.

In order to access the items, users need to take two additional steps, item selection, and item rental, which happen every time people access new clothes. A fixed number of garments and accessories are selected using the website. In the case of Company A, users have a virtual closet that they need to keep full of items they would like to have:

"Browse our collection of thousands of items from top designers"-Company A

Failing to keep the closet full, can lead to not getting the desired clothes. Company A's users can prioritize what items would they really like to get. Items from all three companies are sent out by the company as rentals and users can have them for an undefined amount of time. However, Company C indicates that:

"If you have not returned a Product within twenty (20) days after the return date for the Product, your late return will be considered a non-return". - Company C

The same company offers the option to get additional items by adding a sum to the monthly fee. In contrast to ownership-based consumption, where people only pay once for the product they want, in the use-oriented PSS models, people pay a recurring fee to access a given number of items over a period. Items within these services are rented, the ownership remains with the provider as presented by Selvefors et al. (2019). Because this is not a traditional way of accessing clothes, people are required to follow the instructions created by the provider. Moreover, the use of the service is personal and cannot be transferred to another person. Finally, this specific type of circular offering can only be acquired by people that meet two criteria, those that have access to digital infrastructures, i.e. computers, smartphones, tablets and the internet and those that are part of the financial system, have positive credit and own a credit card. Thus, poor communities, people that can't or do not want to be digitalized and become part of existing financial circuits are excluded de facto from such solutions, raising equality questions to these propositions.

d. Appropriation

As presented in the theoretical background, the appropriation moment of consumption refers to the strategies the users have to make the offering their own and part of their everyday life. Here again, there is a dual perspective, appropriation of the product and of the service, even though both need to be integrated into the user's daily life and domestic sphere. I identified four main actions that help to appropriate the service and the products. The first action is the act of selecting items repeatedly, which enables service appropriation because as suggested by Mifsud et al. (2015) this affords a sense of co-creation and psychological ownership. For example, users of Company A, need to permanently add items to their virtual closets.

"Just remember that if an item is in your closet, it's fair game no matter what the time of year, so curate your closet frequently and put any out-of-season items that you might want later "on-hold." "- Reviewer Company A

For Company B, users need to choose the items they want for their next box. Although this is an action needed before acquiring the products, via renting, it could be considered a form of routinizing the use of the service, thus a form of appropriation. A repeated enacting of the action can improve knowledge and control, all part of the appropriation process.

"what you tell us in your style profile, how you've rated previously rented items and what is trending—but you choose what you get"-Company B

The second set of actions that enable the appropriation of the service refers to the gathering of information. Users need to be aware of their measurements, read items reviews and based on both, figure out their size. This is not a one-time process as the companies do not offer only one brand and shapes change. Using the service becomes a learning and creating experience about the user's body and the items offered by the company. Also, by having the option of customising the experience, users feel under control.

"it takes some finagling and getting used to in order to be successful in renting pieces for everyday life."- Company C

By using the service regularly, users learn how it works, improve their selection process, and can make it part of their routines. The third set of actions refers to wearing clothes, trying different styles and sizes. Again, these actions give a sense of uniqueness to the service, affording control and creation, both dimensions of the appropriation moment described in the literature. Finally, users must review and rate the items they have tried to give the provider information about their experience so they can use it for improving future suggestions. By enabling creation, control and knowing, the service allows users to domesticate it.

e. Appreciation

During the appreciation moment, people derive value from the offering for different reasons. Six themes emerged from the data: having options, economic savings, caring for products, fewer duties, building identity, and product need fit. As indicated by the literature, by offering more options, the offering can create symbolic meaning and contribute to self-expression and individual autonomy (Mugge, 2007; Schifferstein and Zwartkruis-Pelgrim, 2008), as illustrated by this statement:

"I've been able to try styles I would never have tried."- Reviewer Company A

It can also afford to offer flexibility since people don't need to move to a store to access the items. And it also provides functional value to the extent it fulfils the needs of the customer. Because the service provider is responsible for the clothes dry cleaning, customers could save money and benefit economically.

"We professionally clean, sterilize and inspect each Product we send to you." – Company C

Moreover, it is suggested that such a service can help users be in control of what items a user can get. Finally, Company B suggests using the service can help the planet because they are responsible for the washing.

"you're helping the planet by letting us do the laundry." – Company B

At this moment, the dual nature of appreciation is evident, as both the service and the products can provide pleasure and satisfy the user needs.

f. Devaluation

During this moment, the offering loses its value in the eyes of the consumer as a result of different factors. The data shows three elements that contribute to depreciate the service: paying for extra costs, doing extra work, and failing at delivering value. Paying extra costs can be the consequence of late return fees, losing the designated return bag that allows for free returns, having to pay the mailing costs, and being responsible for repairing or replacement costs in case the items are damaged beyond normal wear and tear, as explicitly mentioned in Company C Terms of Reference:

"if you lose or fail to return the RTR carrying case you will be charged $50."

Doing extra work refers to activities that need to be performed to get the best result, and that could be considered additional when compared to a linear offering. For example, users need to read existing user reviews to decide if an item is adequate or not. As they become users, they should write reviews for the company and other users. Users are also required to update their account information. These aspects refer to the service but not to the product. Finally, companies fail in delivering the service when they have problems with logistics or when they give wrong information given the operational challenges of service companies.

"I can't fathom spending $39 on 1 item at a time which takes 7 days to receive." – Reviewer Company A

As suggested by Evans (2018), during this moment, the offering stops providing the benefits that made the user appreciate it. In the case studies analysed here, the economic and functional value of the service failed. We did not find evidence why clothes devalue, though.

g. Divestment

The divestment moment is the result of the previous moment of depreciation. Once the product or the service has lost its value for the current user, there are different paths to be followed. They pause the subscription, or they cancel the subscription. If the decision has been made, and they want to cancel their subscription or extra services, users need to inform and notify providers through different channels, including email, chat, and social media. Regarding the products, people report that they use fewer clothes acquired.

"You may put your Subscription Service on hold for a set period (a "Hold") using "Skip a Month" or "I Need a Break" options in your "Account" page on the Service." – Company B

People using this service do not retain the clothes for a long time, as they are designed for minimizing the time such items are idle by offering free return service and punishing no-returns.

h. Disposal

During this moment of consumption, consumers give up the product or the service. Regarding the product, users return the clothes and accessories to the company using the designated packaging. They can also keep the products and purchase them from the company at a discounted rate. Once people have returned the items, they need to notify the company that they have done so, to expedite the process. Users get notifications from the companies as well to inform them about different matters. Finally, satisfied users keep the service.

"I tried to cancel my membership online, but they no longer allow you to do that, so you HAVE to call and talk to someone who will fiercely try to talk you out of cancelling"

Selvefors et al. (2019) cover cancellation under actions such as finishing the agreement and ending the contract. Return is also considered, but purchasing is not, especially under access-based offerings. This denotes the mixed nature of existing models in the market. Wastling et al. (2018) approach is different and includes fast circulation of goods and reducing operating costs. These can be interpreted as people returning items in a way that helps the company reduce costs.

5.   Conclusion

This research investigated the consequences of circularity on the consumption process by analysing the actions involved in each moment of consumption. The study attends to the need to improve the understanding of the circular economy from a consumption perspective to facilitate the acceptance and adoption of specific offerings raised by Kirchherr et al. (2017) and Lofthouse and Prendeville (2018). A first finding suggests that the consumption process involving circular offerings comprises more than three moments, as previously suggested (Selvefors et al., 2019; Wastling et al., 2018). We found that users taking part in use-oriented PSS for clothing perform actions corresponding to the six moments of consumption suggested by Evans (2018) based on Warde (2005) as illustrated in Figure 1. The data also suggests that the actions in each moment differ for the product and the service components of the use-oriented PSS. This study expands the literature on circular consumption by providing a deeper understanding of the circularity implications on the consumption moments.

As suggested by Lofthouse and Prendeville (2018) design propositions to achieve circularity focus primarily on the characteristics of the product, but as shown in this study, the user experience around the PSS is also a relevant component influencing consumption, and as such, it should also be carefully designed. The specific actions described in this study can support initiative such as those proposed by Selvefors et al. (2019) and Wastling et al. (2018) for creating design tools that start from the user experience of circular offerings and create solutions that meet their needs and involve resource efficiency. From comparing the three case studies, it becomes apparent that the mechanisms and tasks that contribute to the different moments of consumption in the context of use-oriented PSS are varied but similar among companies. However, identifying tasks and actions for the three initial moments of consumption in the sources was more natural than for the last three. Nevertheless, it is not sufficiently clear if it is because it is easier to get consumers away from products/services or because there is not enough information about the drivers behind these processes.

In sum, this research contributes to an analytical framework and empirical data to characterise such a question in the context of use-oriented PSS in the clothing sector. Future research can focus on how circularity influences each of the components of use-oriented PSS in different sectors. Finally, the data sources for this study are limited, hence, constraining the level of detailed achieved. Thus, future research can broaden the scope of data sources to populate some of the insights offered here. Moreover, it is suggested that new studies focus on how circularity influences each of the components of use-oriented PSS in different sectors. This research has several limitations. First, as it has focused only on one type of circular offering for one specific sector and it will be relevant to explore how the different moments of consumption express for different sectors and offerings. Second, further conceptualisation about the type of activities and consequences on how businesses are structured in the context of the circular economy is needed. Third, by using three case studies, the generalizability of the findings is restricted. These shortcomings should be addressed in future research exploring circular business models and consumption.

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PAPER 5

Purpose: The aim of this paper is to contribute to the discussion about the role of design in the circular economy by investigating how existing circular design tools consider and integrate aspects related to consumption and consumers.

Methods: To achieve the study's purpose a template based on theoretical and empirical concepts about consumption in the circular economy was developed. Analysis of five selected tools for circular design currently available in the market. The analysis was carried out based on the data available online and documents provided by the developers of the tool. Five within-tool analyses using the developed template. A cross-tool analysis to explore similarities and differences among the tools.

Results: The tools were analyzed in terms of three consumption aspects, circular behaviors, acceptance factors and contextual conditions. The article offers an analysis of five circular design tools regarding these three aspects. There are significant opportunities to integrate consumption aspects in the analyzed tools, as they considered such aspects only in a limited way.

Contribution: This article provides conceptual framework of consumption aspects to be considered by circular design tools that could contribute to improving the acceptance of circular value propositions and the adoption (or emergence) of circular consumption practices.

Circular design tools: (how) do they understand the consumer?

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Keywords: Circular design tools; circular economy; circular consumption; human-centered design; user perspective

Abstract: A move towards a circular economy will require fundamental changes in the way products and services are designed. However, tools for design in the context of the circular economy mostly have a narrow product or service focus without acknowledging the role of addressing behaviors and changing practices. This paper presents the results of an exploratory study investigating to what extent circular design tools consider and integrate aspects related to consumption and consumers. Using five circular tools publicly available, the research team analyzed how they address three aspects: circular consumer behaviors, consumer acceptance factors and conditions for adoption. Our analysis shows that although some of the tools acknowledge the need to gather insights around consumption and consumers, they do not address such aspects in detail. When the tools considered consumer aspects, they did so by acknowledging circular consumer behaviors. Rent and rebuy are the most frequently mentioned behaviors, while remunerate, retain and renounce are absent from the tools. Other behaviors such as receive, ritualize, regard, revalue, resell and relinquish are mentioned only once. The tools' lack of consideration of acceptance factors and contextual conditions is slightly surprising, as most of them advocate for a human-centered approach to product development. Existing circular design tools could thus benefit from integrating concepts and frameworks from fields such as design for sustainable behavior and practice-oriented design.

Introduction

A move towards a circular economy will require fundamental changes in the way products and services are designed, so that they enable circularity through slowing, narrowing and closing material loops (Bocken et al., 2016). Such new products and services must not only serve a market need but also be designed in a way so that they are accepted and adopted by consumers. The development of successful offerings depends on acknowledgment of the role of consumption and consumers during the design process. However, design in the context of the circular economy is most commonly considered as a tool for "engineering product life extension" (Lofthouse and Prendeville, 2018, p. 454), and does not extensively acknowledge the wider role of design in addressing behaviors (Boks, 2006) and changing practices (Pettersen et al., 2013).

Some efforts have been made to highlight the role of consumption and consumers. For example, Mugge (2017) described factors that influence people's decisions to engage with

circular strategies. Wastling et al. (2018) and Cerulli-Harms et al. (2018) explored behaviors that people need to perform in the context of the circular economy, and Selvefors et al. (2019) explored design strategies that can be used to address users' concerns and make circular offerings preferable over linear ones. Although these and other aspects related to consumption and consumers are gaining attention in literature, they are as of yet not extensively addressed by available circular design tools.

The aim of this paper is to contribute to the discussion about the role of design in the circular economy by investigating how existing circular design tools consider and integrate aspects related to consumption and consumers. The paper initially provides a short overview of important aspects related to consumption and consumers based on existing literature. The methods and sources for the analysis is then presented followed by the main findings and conclusions.

Consumption and consumers in the Circular Economy

Literature highlights a multitude of aspects related to consumption and consumers that are relevant to consider when developing new circular offerings. This paper will focus on three key topics. First, circular consumer behaviors are presented based on previous work (Camacho-Otero et al., forthcoming), building on recent studies about consumption, circular economy and design (Selvefors et al., 2019; Wastling et al., 2018). Second, an overview of factors influencing acceptance of circular solutions and the behaviors they entail, are provided based on existing literature on the topic (Camacho-Otero et al., 2018a). Finally, aspects that could enable the adoption of such offerings and behaviors using a social practice theory perspective (Camacho-Otero et al., 2018b) are addressed.

Consumer behaviors

Emerging circular business models require companies and consumers to interact with products and services in different ways, with the commercial relationship moving beyond the point of purchase. In a forthcoming book chapter, Camacho-Otero et al. discuss several ways through which consumers can interact with products and services offered based on circular business models, here referred to as circular consumer behaviors. As illustrated in Table 1, these circular consumer behaviors can be related to the different moments of consumption defined by Evans, (2018) (acquisition, appropriation, appreciation, devaluation, divestment and disposition), as well as the circular business strategies suggested by Bocken et al. (2016).

Moment of consumption	Behavior	Circular business strategies
Acquisition	Re-buy	Extending product value
	Rent	Access-based consumption
	Receive	Classic long-life
Appropriation	Remunerate	Classic long life
	Ritualize	Classic long life, extending product value
	Retain	Classic long life, extending product value
Appreciation	Regard	Classic long life, extending product value, access-based consumption
	Repair	Classic long life, extending product value
Devaluation	Revalue	Classic long life, extending product value, Access-based consumption
Divestment	Renounce	Classic long life, extending product value, Access-based consumption
Disposition	Re-sell	Classic long life, extending product value
	Relinquish	Classic long life, extending product value
	Return	Access-based consumption

Table 1. Circular consumer behaviors by consumption stage and circular business strategies

Factors of acceptance

Acceptance is a term used in different context such as information technology (Davis, 1993; Venkatesh et al., 2002) and electronic commerce (Ha and Stoel, 2009). In this study, we used the term defined by Schrader (1999) in the context of eco-innovations. He suggested that acceptance is the positive intention of a person to engage with an eco-efficient solution. This intention does in turn depend on different individual factors. In a recent review, (Camacho-Otero et al., 2018a) mapped the different factors offered by the literature on consumer acceptance of product service systems, collaborative consumption and remanufacturing Figure 1 illustrates. Key factors include personal characteristics, product and service offering, knowledge and understanding, experience and social aspects, risks and uncertainty, benefits, and other psychological aspects. However, intention does not always translate into adoption of new offerings or behaviors (Michaud and Llerena, 2011; Welch and Warde, 2014). Hence,

additional aspects and conditions should be considered if adoption is to be understood.
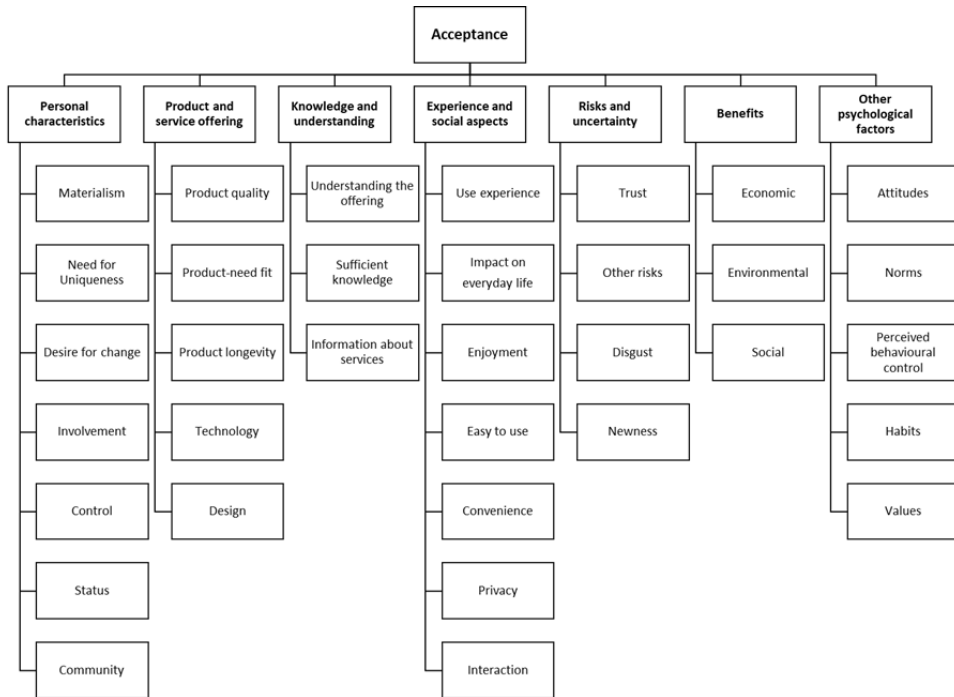

Figure 1 Factors influencing the acceptance of circular offerings (Camacho-Otero et al., 2018a)**.**

Conditions for adoption
Different perspectives exist when investigating the adoption of innovative offerings, for example Rogers' (2003) Diffusion of Innovations Theory, the Multi-Level Perspective by Geels (2005) and more recently, Social Practice Theory -SPT-(Shove et al., 2012). For this study we opted to us the latter based as it has been argued that it can support resource use reductions (Pettersen, 2016).

Social practices are defined as "embodied, materially mediated arrays of human activity centrally organized around shared practical understanding" (Schatzki, 2001, p. 11). Shove and Pantzar (2005), simplify this, suggesting that practices comprise materials, meanings and skills. In addition, Mylan (2015) argues that practices change because their elements change, the interlinkages between elements change, and/or the connections to other social practices transform. In SPT, practices are not just adopted by people, they recruit practitioners. Huber (2017) argues that this

process depends on the opportunities for performing the practice which in turn depend on exposure to the practice, personal histories and capitals, and the ability of the practice to integrate with other practices. Thus, studying why people engage with circular offerings requires understanding why new practices emerge and how they recruit people.

Benefits of considering behaviors, acceptance and adoption
The aspects described in the sections on circular consumer behaviors, factors of acceptance and conditions for adoption, are in different ways relevant to consider if aiming to develop successful circular offerings. Considering both how circularity influences behaviors and which behaviors that circularity may entail, may unveil opportunities to create new offerings that make circular behaviors attractive. Addressing factors of acceptance will further increase the potential for positive perceptions by consumers. Moreover, considering the practice that serves as context

to the offering (including its other elements and the interlinkages between them and other practices) and the processes by which the practice recruit practitioners, will facilitate development of offerings that can more easily be adopted by people and integrated into everyday life. In sum, we argue that it would be beneficial for circular design tools to address circular consumer behaviors, factors of acceptance and conditions of adoption.

Materials and methods

Circular design tools were selected for this study based on literature reviews on circular economy and design (Lofthouse and Prendeville, 2018; Mugge, 2018) and a web-based query in academic databases. From this analysis, 38 documents were identified and screened, only 11 were described as design tools. Of these, we selected five tools using purposeful sampling, see Table 2.

Tool	Source	Description
The circular design guide (CDG) 	Industry (IDEO and Ellen MacArthur Foundation, 2017)	CDG consists of 24 worksheets organised in five groups, Understanding, Define, Make, Release and Advance. The tool includes workshop guidelines for product redesign and safe materials selection.
The circulab board (CLab) 	Industry (Wiithaa, n.d.)	CLab is a business canvas board. It includes instructions to use the board and conduct a workshop.
The circular economy toolkit (CET) 	Academia (Evans and Bocken, 2013)	CET is an online tool intended to be used in a workshop setting by companies looking for opportunites to transition to a circular business model.
Business as Unusual (BAU) 	Academia (Makatsoris et al., 2017)	The BAU is a workshop tool to define new customer journeys based on 2030 scenarios. It offers three worksheets for exploring opportunities for engagement during the design, purchase, use and disposal of a product.
The circular pathfinder (CPF) 	Academia (Van Dam et al., 2017)	CPF is an online tool that aids companies to identify and evaluate circularity strategies. By asking a series of questions, an algorithm suggests alternative strategies for a selected product.

Table 2 Selected circular design tools

PLATE
Product Lifetimes And The Environment

A template for analyzing how the five circular design tools consider and integrate aspects related to circular behaviors, acceptance and adoption, was developed. Insights about the tools were documented in four sections: section one summarizes general information about the tool; section two refers to the type of behaviors that are implicitly or explicitly considered; section three covers factors of acceptance; and section four addresses how the tools consider conditions of adoption. The analysis was carried out based on the data available online and documents provided by the developers of the tool. Worksheets and workshop guidelines were downloaded and used along with online instructions, reports and academic papers. Camacho-Otero and Selvefors conducted five within-tool analyses using the developed template. Once all tools were analyzed, a cross-tool analysis (Creswell, 2014) was performed to explore similarities and differences among the tools.

Results

As illustrated in Table 3, the selected tools address different scales of design. While all address business models, CDG, CET, CPF and also BAU to some extent address service and product design. Only CDG aids the entire design process, including the creation, testing and release of a design. The rest of the tools address specific phases in the design process, and aid companies in exploring opportunities to go circular, but do not provide guidance on how to realize these opportunities. All tools except CET explicitly acknowledge the role of the consumer in their design process, and customer needs and experiences are considered the departing point for the development process. The following three sections describe how the tools consider circular behaviors, factors of acceptance and conditions for adoption, respectively.

Name	CDG	CLab	CET	BAU	CPF
Scope	Business model, Service, Product	Business model	Business model, Service, Product	Business model, Product	Business model, Service, Product
Type of tool	Analogue design tool	Analogue analysis tool	Online and analogue prioritization tool	Analogue analysis tool	Online identification tool
Expected outcome	Designs released on the market	Opportunities for design	Prioritized opportunities	Opportunities for engaging users in the design process	Identified circular strategies
Consumption and consumer related aspects considered	Explicit: Customer experience, feedback, needs and value	Explicit: Customer needs and contexts	Implicit: Consumer behavior	Explicit: Consumer needs, experience and involvement	Explicit: Consumer behavior, consumer preferences

Table 3. Overview of the analyzed tools

Circular behaviors

As summarized in Table 4 BAU is the tool that considers most behaviors while CLab does not consider any, which may be due to its focus on customer needs and contexts. CET and CPF acknowledge the need to consider consumer behaviors because they are part of the offering but do only explicitly include a few behaviors. Rent and rebuy are the most frequently mentioned behaviors, while remunerate, retain and renounce are absent from the tools. Other behaviors such as receive, ritualize, regard, revalue, resell and relinquish are mentioned only once.

Consumption stage	Behavior	CDG	CLab	CET	BAU	CPF
Acquisition	Re-buy	-	-	Re-buy	Re-buy	Re-buy
	Rent	Rent	-	Rent	Rent	Rent
	Receive	-	-	-	Receive	-
Appropriation	Remunerate	-	-	-	-	-
	Ritualize	-	-	-	Ritualize	-
	Retain	-	-	-	-	-
Appreciation	Regard	-	-	-	Regard	-
	Repair	-	-	Repair	Repair	-
Devaluation	Revalue	-	-	-	-	Revalue
Divestment	Renounce	-	-	-	-	-
Disposition	Re-sell	-	-	-	Re-sell	-
	Relinquish	-	-	-	Relinquish	-
	Return	-	-	Return	Return	-

Table 4. Circular consumer behaviors considered by the tool

Factors of acceptance and conditions for adoption

Table 5 summarizes which of the key acceptance factors the analyzed tools address. Notably, only two tools do include references to aspects that may influence people's intention to engage with the solution. These factors include functionality and quality of the offering, the experience with the service, benefits for well-being, emotions and values. CDG focuses on addressing emotion, a psychosocial factor, through marketing strategies. It also suggests emphasizing the symbolic value of the offering so cultural aspects such as identity and status can also be addressed. CPF considered aesthetic aspects of the product and trust.

Name	CDG	CLab	CET	BAU	CPF
Personal characteristics	-	-	-	-	-
Offering	-	-	-	-	Function, quality
Knowledge and understanding	-	-	-	-	-
Experience and social aspects	Experience	-	-	-	-
Risks and uncertainty	-	-	-	-	Trust
Benefits	Wellbeing	-	-	-	-
Psychological factors	Emotions, values	-	-	-	Values

Table 5. Factors of consumer acceptance considered by the tool

The findings also show that only a few tools address conditions for adoption, and when they do, it is only tangentially. For example, CDG suggests that to contribute to a regenerative system, companies need to think of their context, which is expressed as the social conditions of their environment and their employees. CDG guidance focuses on exploring options to increase the value for employees to work with the company and for local communities where the company operates. It does not refer to the social practice in which the product or service is embedded. CLab indicates the need to understand the relevant contexts in which the offering can resolve the problem but does not provide further detail on how to do it. The rest of the tools do not analyze the context of the solution.

Conclusions

The aim of this study was to investigate whether existing design tools consider consumption and consumer related aspects. Our results coincide with (Lofthouse and Prendeville, 2018) who indicated that so far, design has not focused enough on the role of consumers in the circular economy. Our analysis shows that although some of the analyzed tools acknowledge the need to gather insights around consumption and consumers, they do not address such aspects in more detail.

Circular consumer behaviors is the topic that most of the tools addressed. Acquisition and disposition behaviors such as rent, re-buy and return were more prominent among the tools than appropriation, appreciation, devaluation and divestment behaviors. This can be a consequence of a restrictive understanding of the consumption process. Nonetheless, in the context of a circular economy, behaviors such as remunerate, and repair become relevant.

The very limited consideration of acceptance factors and contextual conditions in the tools is slightly surprising, as most of them advocate a human-centred approach to product and service design. The tools that considered some factors focused on values, emotions, product quality and experience, but dismissed personal characteristics, knowledge, and risks. This is problematic as lack of acceptance of circular solutions often is associated with materialism, lack of trust and contamination. Finally, we detected a minimal consideration of the context of the offerings. This can contribute to a slow or even lack of adoption, even when the offering is accepted, and people are willing to engage. If an offering is difficult to be integrated into existing practices or become part of new practices that recruit practitioners, it is unlikely to succeed. Thus, the need to better understand the context and evaluate the risks regarding adoption.

We suggest that circular design and circular design tools should focus more on consumer behaviors needed in the context of circular offerings, as well as on factors of consumer acceptance and conditions for adoption. Existing circular design tools could therefore benefit from integrating concepts and frameworks from fields such as design for sustainable behavior and practice-oriented design.

Acknowledgments

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PAPER 6

Camacho-Otero, J., Boks, C., Pettersen, I. N., 2018. Changing the game: consumer perceptions and factors of acceptance for circular solutions in the toy sector. Manuscript developed based on the abstract presented at the 23rd International Sustainable Development Research Society Conference. Messina.

The manuscript included in this thesis was developed based on the abstract presented at the conference.

Purpose: This study aims expanding the understanding of consumer acceptance of access-based consumption in the context of emerging economies. It investigates the factors influencing participation in use-oriented product service systems for toys, specifically related to the product, the service and the consumer.

Methods: The empirical data was collected through an online questionnaire administered to users of a subscription service for toys in India. 29 valid responses were collected and qualitatively analyzed.

Results: The study provides a set of factors group under the categories product, service and user that influence the acceptance of the circular value proposition analyzed. It contributes to expanding the understanding of consumer acceptance in the context of emerging economies and of a product category that has not been extensively analyzed despite its potential for circularity.

Changing the game: consumer perceptions and factors of acceptance for circular solutions in the toy sector

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Introduction

90% of all toys produced are made of plastic (Plastics The Mag, 2011). In a recent study, Geyer et al. (2017) calculated that only 9% of all plastic ever produced had been recycled, and only 10% of this share has been recycled more than once. As with plastics in general, plastics toys have multiple environmental impacts that need to be tackled. According to Tolley-Stokes (2012) in the UK, only 35% of toys are donated or sold for reuse while the rest is sent to landfills or incinerators. Additionally, plastic toys' life time has become shorter, with toys being discarded faster today than 20 years ago in the UK. This trend is fuelled, among others, by "the devaluation of toys from special, cherished heirlooms to disposable commodities" (p. 931).

In this context, companies and entrepreneurs working with toys, are exploring strategies to reduce such environmental impacts by using the principles of the circular economy. For example, LEGO launched their botanical collection of bricks made from plant-based plastics sourced from sugar cane. The start-up Ecobirdy developed children's furniture from recycled toys. Another option within the circular economy is the use of recycled plastic in the manufacturing of toys. However, different reports have found traces of toxic chemicals in samples of recycled toys making this option rather risky (CHEM Trust, 2017; DiGangi and Strakova, 2015). Finally, access-based solutions enable multiple use of products from different consumers. Under this model, companies retain the ownership of a product and offer the function to the users in exchange for a periodic fee increasing the number of use cycles per item, theoretically avoiding production of new goods.

An example of access-based consumption are use-oriented product service systems (Tukker, 2004). Under this model, a company rents a product to their customers for a short period of time and then gets it back to rent it out to the next customer. This type of business model has been implemented in the clothing sector (Camacho-Otero et al., 2019; Park and Armstrong, 2017) and it is starting to be considered for toys (Stodart, 2019). One of the main obstacles these solutions face is the lack of support from the market (Rizos et al., 2016) as consumers fail to engage and participate as they seem to be too radical (Ceschin, 2013).

Studies addressing circular solutions for toys are scarce. Ozanne and Ballantine (2010) explored how anti-consumption influenced parental decision to use toy libraries. On the other hand, Pérez-Belis et al. (2013) investigated consumers' perception of waste management strategies for electronic toys. Through a survey of toy library users in New Zealand, Orzanne and Ballantine found that aspects such as reducing consumption behaviour, the potential of toy libraries to enable community capacity, the prevalence of friendship, financial saving potential, anti-materialistic and voluntary simplification values expression, all had a role in using toy libraries. The study identified four user groups: socialites, market avoiders, quiet anti-consumers and passive members. Each group was analysed in terms of demographic variables, finding that socialites had more children, and exhibiting low income. Passive members had the highest income levels and the lower assessment of the libraries. Additionally, the authors found that half of the sample held anti-consumption attitudes, while the other half was more focused on other type of benefits, such as social aspects. In conclusion, anti-consumption seems to underpin sharing behaviour in this specific case.

Pérez-Belis et al. (2013) investigated consumption and toy management habits in the Spanish context with the purpose of identifying opportunities for awareness-raising campaigns. Parents were surveyed using a questionnaire focusing on three topics, information about the consumer, toy consumption habits, and toy management habits at their end of life which included "reasons for disposal, average lifespan, disposal practices, alternatives for extending lifespan, and knowledge about meaning of the WEEE logo". (p. 280). Their results showed that toy consumption is higher during

special occasions such as Christmas, birthdays and other events, although the number of toys varies among these moments. They also found that the higher the number of children in a family the lower the level of toy consumption. The authors speculate that this behavior could be driven by toy reuse. Electrical and electronic toys were discarded, firstly, because they were damaged or stopped working and secondly, because they were not longer in use by children. A significant number of parents reported to have extended toys lifespan by given them to relatives and friends, followed by donations and disposing them in the mixed waste bin. A small portion of parents reported to have brought them to the recycling point. In this study, the authors asked respondents about their willingness to rent or buy second-hand toys, with 65% indicating they would not rent, but 57% would buy second-hand. The study found no statistical relationship between the different variables.

These studies provide important insights into consumer behavior associated with toys and sustainable solutions such as peer-to-peer sharing. Building on these findings and aiming at expanding the understanding of consumer acceptance of access-based consumption in a different socio-cultural context, the present study investigates the reasons why people in emerging economies participate in use-oriented product service systems for toys, specifically related to the product, the service and the consumer. The following section introduces the theoretical framework that underpins this research. Section 3 presents the materials and methods used to collect and analyse the data. Findings are described and discussed in section 4. We then present the main conclusions of the study.

Toys as consumer goods
Toys are a complex object that has been addressed by multiple fields of study, to understand their role in society in the context of different practices such as education, play and leisure. According to the Encyclopedia of Consumer Culture, toys have been considered in the academic literature as training and socialization tools for children, commodities and objects for reminiscence. As training tools, toys are critical objects in child development since they are "used as markers in developmental progressions of play, gradually disappearing in the sequential transitions that demonstrate a child's social and intellectual advancement" (Woodyer, 2011, p. 1469). Toys are also part of

children's socialization processes and of understanding the outside world as they come with embodied meanings regarding history and social structures.

More recently, have become commodities as they been absorbed by the world of entertainment. Multi-media producer companies and toy manufacturers have come together to develop products targeted to children that are closely associated to the content of their visual products. (Woodyer, 2011) suggested this is a strategy to transform children into consumers. Additionally, it is also argued by scholars that such model also limits the ability of children to create their own narratives, as toys already come with one, that of the movie, the game or the television series. An additional point made by academics is that because toys have such strong links to structured narratives and stories that are more frequently than not, based on fantasies and fictional stories, toy are losing their ability to serve as socializing tools for children.

Finally, toys have also transcended children and have become part of the adult world, through collectables. This phenomenon is associated to an increasing nostalgia. This has contributed to an increased production and demand for toys, in conjunction with more efficient modes of production supported by plastic technology (Tolley-Stokes, 2012). Additionally, changes in how children are raised, allowing for more independent decisions, is alleged to have contributed to the recent consumerist orientation of children (Woodyer, 2011). Thus, toys can be a special type of product that enables development process in children, but it can also be considered as another consumer good that mediates identity. These aspects affect the decision of how and when to acquire toys, influencing the perception and level of interest of consumers in innovative alternatives such as subscription services of toys.

Circular business models: use-oriented product service systems
According to (Tukker, 2004, p. 248) in a use-oriented PSS "the product stays in ownership with the provider, and is made available in a different form, and sometimes shared by a number of users." Since the time the article was published, this type of business model has been adopted in several sectors. For example, in the mobility sector, car-sharing schemes owned by car companies have inundated the main cities of Europe and North America (Bardhi and Eckhardt, 2012). This model has been also

applied to other forms of personal mobility such as bicycles, mopeds and more recently, scooters. The implementation of sharing services has been enabled by the ubiquity of the internet, geolocation and digital devices such as smartphones (Accenture, 2014). With the advancement of sensors and the Internet of Things technology, new products are joining this trend, for example white goods, and more recently clothes.

Use-oriented PSS has been advocated by sustainability scholars for a long time as they can contribute to the reduction of material use by unit of value (Heiskanen and Jalas, 2003; Mont, 2008, 2002). However, this statement has been widely disputed by experts from the field of sustainability assessment and even by their initial advocates (Mont and Tukker, 2006; Tukker, 2015; Tukker and Tischner, 2006). According to their arguments, the environmental potential of PSS in general and use-oriented PSS has been hindered by low adoption levels. More recently, (Farrant et al., 2010) performed a Life Cycle Analysis of different businesses enabling clothes reuse and found that their environmental effect depends on to what extent they replace consumption of new clothes. This perspective is reinforced by (Iran and Schrader, 2017) in their analysis of collaborative consumption of clothes when they suggest that an environmental benefit will only realize if consumption through this type of business model replaces linear consumption.

Consumer acceptance

Schrader (1999) first introduced the idea of consumer acceptance in the context of eco-efficient solutions. He defined the concept as the "readiness to adopt a new product or service" (p. 110) which in turn depended on the attitude towards the solution. In his early analysis, the author indicates that acceptance is influenced by the material good, and in his words "the product should not be too attractive as a private possession, but rather be suitable as the basis for a service" (ibid). In this study, he focused on the role of the price, use intensity, storage space and product involvement. He also addressed socio-demographic factors such as age, education, gender, size of housing, and income. He also addressed psychosocial aspects such as materialism, innovativeness, desire for independence and environmental awareness. Finally, and drawing from Roger's Diffusion of Innovations, the paper explored the service offered

in terms of relative advantage, compatibility, complexity, trialability, observability and service provider. Table 1 summarizes the literature addressing each acceptance factor in the context of access-based and collaborative consumption.

Table 1 Consumer acceptance factors in the literature

Category	Factor	Literature
Product	Price	(Paundra et al., 2017)
	Product type	(Schrader, 1999)
	Product involvement	(Bardhi and Eckhardt, 2012; Lee and Kim, 2018; Paundra et al., 2017; Philip et al., 2015)
	Product quality	(Baxter et al., 2017)
Service	Environmental benefits	(Catulli, 2012; Hazen et al., 2016; Van Weelden et al., 2016)
	Financial benefits	(Lawson et al., 2016; Schaefers et al., 2016; Tussyadiah and Pesonen, 2016)
	Social benefits	(Lutz et al., 2017; Yang et al., 2017) and (Tussyadiah and Pesonen, 2016)
	Convenience	(Jae-Hun Joo, 2017) (Tussyadiah, 2016) (Rexfelt and Hiort af Ornäs, 2009)
	Experience	(Ozanne and Ballantine, 2010)
	Trust in the provider	(Barnes and Mattsson, 2017; Möhlmann, 2015)
	Product knowledge	(Catulli and Reed, 2017; Wang and Hazen, 2016)
Consumer	Gender	(Gopalakrishnan and Matthews, 2018; Gwozdz et al., 2017; Pedersen and Netter, 2015; Weber et al., 2017)
	Age	(Akbar et al., 2016; Prieto et al., 2017).
	Income	(Gwozdz et al., 2017; Weber et al., 2017)

Education	(Gaur et al., 2015; Lakatos et al., 2016) and (Ballús-Armet et al., 2014)
Materialism	(Ozanne and Ballantine, 2010) (Davidson et al., 2017; Lawson et al., 2016).
Control	(Jiménez-Parra et al., 2014; Johnson et al., 2016; Khor and Hazen, 2017; Michaud and Llerena, 2011)
Status	(Catulli et al., 2017, 2016; Lawson et al., 2016; Wilhelms et al., 2017) (Tussyadiah and Pesonen, 2016)
Uniqueness	(Lang and Armstrong, 2018)
Sharing	(Geiger et al., 2017)

The product

In regards to the product, Schrader (1999) suggests that the price, use intensity, storage space and product involvement are all aspects influencing acceptance. Price has been addressed by other authors exploring sharing solutions such as Paundra et al. (2017) who found that the price is relevant for car sharing users as long as they have low psychological ownership, i.e. they do not have a strong possessive feeling towards the car. Regarding use intensity, Schrader indicated that products in an eco-innovative service should be "durable", i.e. have long lifespans and not be used intensively. Moreover, products that require significant space in a household are good candidates. Finally, product involvement, or the importance assigned to the product by the individual in their daily live, has been confirmed as relevant for acceptance by more recent studies (Bardhi and Eckhardt, 2012; Lee and Kim, 2018; Philip et al., 2015). These authors found that products that are important for consumers would be harder to be included in a product-service system. Paundra et al. (2017) uses a similar construct, psychological ownership, to refer to a analogous phenomenon and reaches an comparable conclusion, people with high psychological ownership over a product, participate less in a PSS offering. Other aspects related to the product have been considered as relevant in the context of access-based solutions. These include

product quality (Baxter et al., 2017), product longevity (Mont, 2004; Philip et al., 2015), and product design (Armstrong et al., 2015).

The service

Schrader (1999) indicated that the service side of a product service system also influences consumer acceptance. The first aspect suggested by Schrader is the relative advantage which here is understood as the benefits the novel offering creates compared to an ownership-based models. Financial, functional and socio-psychological advantages and disadvantages such as cost savings, environmental friendliness, and reduced flexibility are all part of this category. More recent studies have also explored this aspect, for example Lawson et al. (2016), Schaefers et al. (2016) and Tussyadiah and Pesonen (2016) investigated financial benefits in the form of discounted prices or cost savings in addition to economic benefits. Catulli (2012), Hazen et al. (2016), and Van Weelden et al. (2016) indicated that environmental benefits also influence acceptance of such type of offerings. Finally, authors such as Lutz et al. (2017), Yang et al. (2017) and Tussyadiah and Pesonen (2016) explored social benefits associated with status perception, privacy and enjoyment.

The second question Schrader asked about the service, was related to compatibility. Here, he defined it as the ability of the service to integrate with the consumer current lifestyle understood in a broad sense (values, attitudes, behaviours and habits). He found that owners would have lower acceptance towards eco-services than non-owners. Later studies have similar results. For example, Tietze et al. (2015) investigated the relationship between ownership, control and innovativeness in users. They found that separation from ownership and control, negatively impacted the level of user innovativeness. Paundra et al. (2017) used an experimental setting to explore how psychological ownership influenced the effects of car instruments on the consumer intention to participate in a car sharing offering. Participants with high psychological ownership had a lower intention to use the service. Another perspective to explore this aspect refers to the convenience of using circular offerings. Jae-Hun Joo (2017) investigated this aspect in the context of car sharing and found that it determines intention as did Tussyadiah (2016) in the case of peer-to-peer accommodation. An interesting approach to this aspect was provided by Rexfelt and

Hiort af Ornäs (2009) who suggested an activity framework to understand acceptance. They indicated that an offering that enables desired activities and prevents unwanted ones, would be more acceptable than the contrary.

The complexity of the service, or how easy is it to use by the consumer, has been addressed by researchers looking into perceived behavioural control such as Jiménez-Parra et al. (2014), Johnson et al. (2016), Khor and Hazen (2017), and Michaud and Llerena (2011). They found that services that are perceived as more difficult to use, result in a lower intention to use it as predicted by the Theory of Planned Behaviour (Ajzen, 1991). Finally, consumer acceptance also depends on its trialability and observability. The former refers to what extent a consumer can test it before committing and the latter can be linked to the knowledge the consumer can have before engaging. Under trialability, aspects related to trust in the provider (Barnes and Mattsson, 2017; Möhlmann, 2015) and in other users (Hofmann et al., 2017) are relevant. Observability has been explored by researchers through variables such as knowledge about the product (Catulli and Reed, 2017; Wang and Hazen, 2016), the information available about the offering and the level of understanding of the offering (Gullstrand Edbring et al., 2016). Both aspects have been addressed in the literature as well, in terms of risk and uncertainty by Etzioni (2017), and Wang and Hazen (2016).

The consumer

In addition to the product and the service, Schrader argues that socio-demographic aspects are influential. A first aspect is age as ownership is usually more common later in life, making it more difficult for older people to give it up. More recent studies on acceptance have also acknowledge this aspect (Akbar et al., 2016; Prieto et al., 2017). Education is another aspect relevant for acceptance as it is argued that innovators and early adopters usually have higher levels of education. In broader studies about circular economy, Gaur et al. (2015), Lakatos et al. (2016) and Ballús-Armet et al. (2014) investigated this relationship as well. Gender was also analysed by Schrader finding that it influenced positively the importance of ownership but changes in terms of product category. Other studies such as Lee et al. (2015) and Abdar and Yen (2017) explored gender differences regarding access-based models

for accommodation. Other aspect related to the customer suggested by Schrader and later used by other authors was income (Böcker and Meelen, 2017; Gargiulo et al., 2015; Gaur et al., 2015).

To complement these findings, additional factors related to the consumer that have been connected to the disposition to participate in access-based and collaborative consumption were included in the study. These aspects include materialism, control, status, desire for uniqueness and sharing disposition. Materialistic individuals may have trouble engaging with access-based solutions (Davidson et al., 2017; Lawson et al., 2016). The role of status has also been explored (Catulli et al., 2017, 2016; Lawson et al., 2016; Wilhelms et al., 2017). Other aspects include the need for uniqueness (Lang and Armstrong, 2018), the desire for change (Armstrong et al., 2015), and the sense of community (Catulli et al., 2016). Materialism was investigated by Ozanne and Ballantine (2010) in the specific context of toys access-based consumption finding that parents holding anti-materialistic values used toy libraries.

In sum, this study set to investigate how factors related to the product (product type, price, product involvement, and product quality), to the service (experience, complexity, relative advantages, trialability, and observability), and to the consumer (gender, age, family structure, education, employment, materialism, control, status, desire for uniqueness, and sharing disposition) express in parents using toy subscription services. By doing this, the study aims at expanding the knowledge about acceptance factors of use-oriented PSS in emerging economies.

Materials and methods

In this section, we describe the approach and steps taken to collect and analyse data to answer the research question. Although a questionnaire is usually connected to quantitative forms of research, in this case it was used as an exploratory tool to investigate to what extent users of a use-oriented PSS for toys were concerned with the issues suggested by earlier studies and met some of the characteristics the literature indicates drives people to participate in such offerings. This study builds on a previous work investigating user acceptance in the fashion sector (Camacho-Otero et al., 2019).

To collect data to help in addressing the study's research question, we developed an online questionnaire combining open and closed questions investigating the different aspects presented in section 3.

The survey was developed using an online secure provider that enabled anonymisation of respondents. The online questionnaire first presented a summary of the project and asked for consent from participants. The second section collected general socio-demographic information. The third section explored factors connected to the product part of the offering including product type, price, product involvement and product quality. In this section, parents using the subscription services were asked about the type of toys they access through the service, their belief regarding the price and quality of the product and the construct, product involvement. This section and the subsequent ones were only answered by people that reported to have used a use-oriented PSS for toys.

The fourth section focuses on the service aspects, it asks respondents about their experience with the service. In this section, customers are also asked about their perception of convenience as an indicator of the level of compatibility. Relative advantages are also addressed in this section by asking respondents about what financial, environmental and social benefits do they get and how satisfactory are they with those benefits. Trialability is explored via the customer's belief that the provider will engage in different types of behaviours. Observability was explored by asking customers about the type of information they get from the provider about the product and the service and if they have read the terms of service. The final section focuses on the personal characteristics of the user, and is based on existing Likert scales assessing materialism (Richins, 2004), need for control (Burger and Cooper, 19s79), status (Eastman et al., 1999), desire for uniqueness (Ruvio et al., 2008) and disposition towards sharing (Akbar et al., 2016).

In order to recruit participants, companies offering use-oriented PSS where identified using different web searches. Twelve companies were identified, and eleven were contacted. Two companies responded positively and sent out an email invitation on July 2019 and make a post on their Facebook groups, asking customers to fill the survey. The survey was run through a professional online survey provider. The survey

was open for 6 weeks, collecting 37 responses, 36 from company A and 1 from company B. Thus, only responses from company A were considered. Data collected through the questionnaire was analysed using descriptive statistics to summarize and analyse the results. For Likert-type questions, the median was used as centre tendency measurement.

Results and discussion

The results from the questionnaire are described and discussed in this section. All respondents were based in India, in cities such as Bangalore, Pune and Jaipur. Out of the 37 respondents 28 have used a toy subscription service.

The product

To explore the type of products accessed via the service, six different examples were provided, which fit in three main categories, learning and development, socialization and commodification toys. Respondents could choose several categories. Most accessed toy types were development and learning exemplified with The Rainbow Tower® and the Stroll & Discovery Activity Walker®. Some respondents indicated that they used the service to use Lego®, also considered here as a learning and development toy. Socialization toys were represented using an excavator and a make-up kit as they are marketed primarily to boys and girls, respectively. According to the results, 61% of the respondents used the service to access toys like the excavator and only 25% for accessing toys such as the make-up set. The last category refers to toys developed to engage children with media characters. We chose a Transformers® action figure and a Barbie® family. These toys were the least accessed via the service. In contrast with what was suggested in the other studies, this specific use-oriented PSS is based on non-durable, low-priced product such as toys. Within this product category, parents use the service to access rather durable, high-priced products.

Regarding the price, most respondents indicated that they considered it to be about right (68%), while the rest considered that it was somehow high and too high (32%). Most of the parents in this last group have one child. The third element influencing the intention to participate in this type of solutions is the level of product involvement, or

how relevant toys are for the customer. Given the nature of the product, this relationship may be mediated by the parent-child relationship. According to the findings, most respondents declared a high level of involvement with the product. This finding seems to contradict previous research which suggests that high involvement may hinder participation in this type of offering (Lee and Kim, 2018; Paundra et al., 2017). Finally, the quality of the toys was assessed as high, reaching an average of 84 points over 100.

The service

The second set of factors influencing acceptance refer to the service. The first aspect that influences acceptance of a service is the relative advantages it offers. This aspect was investigated in the questionnaire by asking respondents what type of benefits they got from using the services. The options available included financial, environmental and social benefits. According to the responses "My kids get more variety" was the benefit most selected by respondents followed by "I buy less toys". The least chosen ones were items under the social category, "I belong to a community" and "I meet other parents". In the environmental category, "We do not throw away toys" was selected by most respondents. Compared with previous literature, these results support the idea that reduced consumption is an advantage of these services but contrast with the idea that they are used to improve social connections. They also show how waste prevention is an important aspect for users of the service. Finally, financial advantages, as saving money and buying less are still good reasons for parents to engage with this solution confirming previous findings.

The second aspect related to the service and suggested by Schrader (1999) is its compatibility. The questionnaire addressed this issue by asking about the convenience of using the service. Most respondents found the service very convenient. As expressed by one of the respondents, *"We can make our own preference list. And pick up and drop has no hassle"*. However, one user indicated the service was somewhat inconvenient because *"It's a disturbance to take n return (after packing) Small parts get lost"*. Other aspects relevant for respondents in this regard include good customer care, regularity in their deliveries, flexibility, door to door service, ability to choose items, and no extra charges. In addition to the convenience aspect, respondents were

asked about the overall experience with the service. Most respondents were satisfied and very satisfied with the service. Only one respondent expressed dissatisfaction with the service. In the literature, compatibility is also connected to characteristics of the consumer, in terms of psychological ownership and control. These aspects were explored and will be discussed in the following subsection.

The two last aspects suggested by Schrader are observability and trialability. In this study, observability was treated as the kind of information people get about the product in the offering in terms of materials, previous users, and instructions for use. Most respondents indicated they got information about instructions for use and materials. No information about who was the last user was provided. Finally, trialability was addressed by asking questions about the likelihood of the provider making mistakes regarding the service and customer service quality. This aspect was explored by asking users the to what extent they would agree or disagree to a set of statements about the provider making mistakes, making unauthorized charges to their payment method and accepting returns and replacing toys. Regarding the first two aspects, 64% and 79% of respondents indicated that they disagree and totally disagree with statements suggesting that the provider would make such mistakes. Regarding accepting returns and replacing toys, 68% if the respondents agreed and strongly agreed with the statement.

The user

From a demographic perspective and as illustrated in Table 2. Users were mostly female (62%) in their early 30s (54%). Non users were mostly female at the age range extremes, in their 20s and 40s. Most households have one young child between one and six years old. Most users have one child, while users 43% chance of having two children. Most non-users have a bachelor, while most users have a master. Regarding employment, only three respondents were unemployed at the time of the survey, one user and two non-users. Almost half of the respondents were full time employees working more than 35 hours per week, while near one quarter reported to be self-employed. These results are consistent with suggestions from the literature that indicate that younger, highly educated people could be more attracted to innovative services such as use-oriented PSS.

Table 2 Socio-demographic characteristics

Gender	Count	%
Female	22	61%
Male	14	39%
Total	**36**	**100%**

Number of children	Count	%
One	28	78%
Two	8	22%
Total	**36**	**100%**

Children's age range	Count	%
1-3 years old	13	36%
3-6 years old	17	47%
Less than 1 year old	2	6%
Over 6 years old	4	11%
Total	**36**	**100%**

Education level	Count	%
Bachelor	16	44%
Master	17	47%
PhD or more	3	8%
Total	**36**	**100%**

Employment type	Count	%
Self-employed (10-35 hours per week)	2	6%
Self-employed (35 or more hours per week)	9	25%
Unemployed	3	8%

Working full-time paid employment (35 or more hours per week)	17	47%
Working part-time paid employment (10-35 hours per week)	5	14%
Total	**36**	**100%**

In addition to demographic variables, the study explored five additional factors connected to the user, attitude towards control, status, and sharing as well as materialistic values, and desire for uniqueness. Table 3 presents the percentage of respondents per Likert item according to agreement level.

Table 3 Frequency of respondents per level of agreement and Likert item

Component	Question	I strongly agree	I agree	Neutral	I disagree	I strongly disagree	Total
Control	I try to avoid situations where someone else tells me what to do	3%	29%	29%	35%	3%	100%
	I am enjoy being able to influence the actions of others	13%	48%	29%	10%	0%	100%
	I would rather have someone else took over the leadership role	0%	10%	42%	32%	16%	100%
Materialism	I admire people who own expensive homes, cars, and clothes.	0%	6%	42%	23%	29%	100%
	I like a lot of luxury in my life.	10%	16%	29%	26%	19%	100%
	I would be happier if I could afford to buy more things.	13%	19%	29%	26%	13%	100%
Status	I would get a product just because it has status	0%	13%	6%	39%	42%	100%
	I would pay more for a product if it had status	0%	16%	13%	42%	29%	100%

Category	Statement						
	The status of a product is irrelevant to me	23%	32%	13%	32%	0%	100%
	I own a unique collection (knives, stamps, coins, etc).	3%	19%	13%	45%	19%	100%
Uniqueness	As a rule, I dislike products or brands that are customarily bought by everyone.	0%	6%	55%	32%	6%	100%
	I actively seek to develop my personal uniqueness by buying special products or brands.	6%	32%	23%	26%	13%	100%
	I have a high willingness to use things together with others for a fee	6%	45%	45%	3%	0%	100%
Sharing	Sharing consumer goods with others for a fee is a good alternative to ownership.	26%	55%	16%	3%	0%	100%
	In the future I will share more instead of buying	23%	45%	32%	0%	0%	100%

The desire for control was explored using items from the scale developed by Burger and Cooper (1979). The questions in this section addressed three aspects, avoiding being told what to do, influencing others and giving up control. Even though respondents tended to place their answers in the mid-point, an important portion disagreed with the two statements suggesting giving up control (35% and 32%) and agreed with the one referring to influencing others (48%). The study addressed materialistic values using items developed by Richins (2004). Most respondents indicated that they disagreed or strongly disagreed with the statements involving luxury and admiration to others because of expensive possessions but were less definite regarding the option of having more things. Some respondents indicated that they strongly agree with the statements about having a lot of luxury in their lives and wishing to have more things. Materialistic values do not seem to be widespread among the respondents which supports previous findings (Ozanne and Ballantine, 2010).

The question about attitudes towards status had a similar response. Most respondents disagreed or strongly disagreed with the items used, they indicated they did not get products because they afford status. In general, most of the respondents did not care about such meanings. For evaluating desire for uniqueness, the study used items from Ruvio et al. (2008). The results from the questionnaire did not show if respondents had a clear position regarding the importance of uniqueness. Most responses were either neutral or divided between agreement and disagreement. If anything, respondents did not regard uniqueness as relevant. The last question regarding attitude towards sharing shows that most respondents agree with the statements used from Akbar et al. (2016) instrument. Hence, people using this service think sharing is a good alternative to ownership and expect to use it more in the future.

Conclusions

This study aimed at expanding current understanding of consumer acceptance towards use-oriented PSS for toys. Toys result in several environmental impacts due to their materials and use patterns. Access based consumption has been suggested to improve efficiency by intensifying use and enabling multiple lifecycles. Consumer

acceptance is influenced by several aspects, including some linked to the product, to the service and to the consumer. Toys are a special type of product because the person that acquires it differs from the person that uses it. Regarding acceptance of novel offerings such as use-oriented PSS, it was deemed relevant to ask the person responsible for acquiring the service (the parent) rather than the user (the children), as the parents' function as gatekeepers. This study provided a description of how parents using a subscription service for toys perceived the product and the service parts of the offering and offered how they performed regarding some of the personal characteristics that have been presented as relevant for consumer acceptance in the literature. Future research could further investigate if consumption through this type of offering does replace ownership-based consumption of primary products, to assess its sustainability. Additionally, more research is needed regarding the diffusion of this type of offerings in different socio-economic contexts.

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Appendices

Appendix A

Topic	Question	Options	Source
Respondent ID	Automatic	Automatic	
Collector ID	Automatic	Automatic	
Start Date	Date	Date	
End Date	Date	Date	
General information	What is your gender?	Response	
	In which city and country do you live?	Open-Ended Response	
	In which city and country do you live? Clean		
	How old are you?	Open-Ended Response	
	How many children do you have?	Response	
	What age range are your children?	Response	
		Add other children (Please specify age)	
	What gender are your children?	Open-Ended Response	
	What is the highest level of education you have reached?	Response	
	What is your yearly income in Euros?	Open-Ended Response	
	Which of the following best	Response	

	describes your current employment status_		
	Are you using or have you used a subscription/rental service for toys?	Response	
	What is the name of the toy subscription service you use/have used?	Open-Ended Response	
The product	What type of toys do you get through the service?	Construction machine	(Woodyer, 2011)
		Music machine	
		Cosmetics	
		Transformer	
		Barbies	
		Disc tower	
		Other (please specify)	
	Do you think the prices charged for the service are too high, too low, or about right?	Response	
	Please indicate to what extent do you agree or disagree with the following statements	What toys my children have, is important to me	(Laurent and Kapferer, 1985)
		If I get my children the wrong toys, it is not a big deal	

		I enjoy getting toys for my children or other kids	
	How would you rate the quality of the toys available in the service?	Open-Ended Response	
The service	Were you satisfied or dissatisfied with your last experience with the company?	Response	(Rexfelt and Hiort af Ornäs, 2009)
	How convenient is the service?	Response	
		Please explain.	
	What type of benefits do you get from this service?	I save money (financial)	
		I buy less toys (financial)	
		We do not throw away toys (environmental)	
		I get toys that last more (environmental)	
		My kids get more variety (social)	
		I meet other parents (social)	
		I belong to a community (social)	
		Other	
	How would you rate the financial benefits of using the service?	Open-Ended Response	
	How would you rate the environmental	Open-Ended Response	

	benefits of using the service?		
	How would you rate the social benefits of using the service?	Open-Ended Response	
	To what extent do you agree that the company would do some of the following	Make a mistake when sending your package	
		Make unexpected charges to your card	
		Accept returns and replace a toy that does not work properly	
	What kind of information do you get about the toys you will get through the service?	Materials	
		Who was the last user	
		Instructions for use	
		Nothing	
		Other	
	Have you read the Terms of Use and/or Privacy Policy of the service?	Response	
		Please explain why.	
The user	To what extent do you agree with the following statements	I try to avoid situations where someone else tells me what to do	(Burger and Cooper, 1979)
		I am enjoy being able to influence the actions of others	

	I would rather have someone else took over the leadership role	
To what extent do you agree with the following statements	I admire people who own expensive homes, cars, and clothes.	(Richins, 2004)
	I like a lot of luxury in my life.	
	I would be happier if I could afford to buy more things.	
To what extent do you agree with the following statements	I would get a product just because it has status	(Eastman et al., 1999)
	I would pay more for a product if it had status	
	The status of a product is irrelevant to me	
To what extent do you agree or disagree with the following statements	I own a unique collection (knifes, stamps, coins, etc).	(Ruvio et al., 2008)
	As a rule, I dislike products or brands that are customarily bought by everyone.	
	I actively seek to develop my personal uniqueness by buying special products or brands.	
To what extent do you agree or	I have a high willingness to use things together with others for a fee	(Akbar et al., 2016)

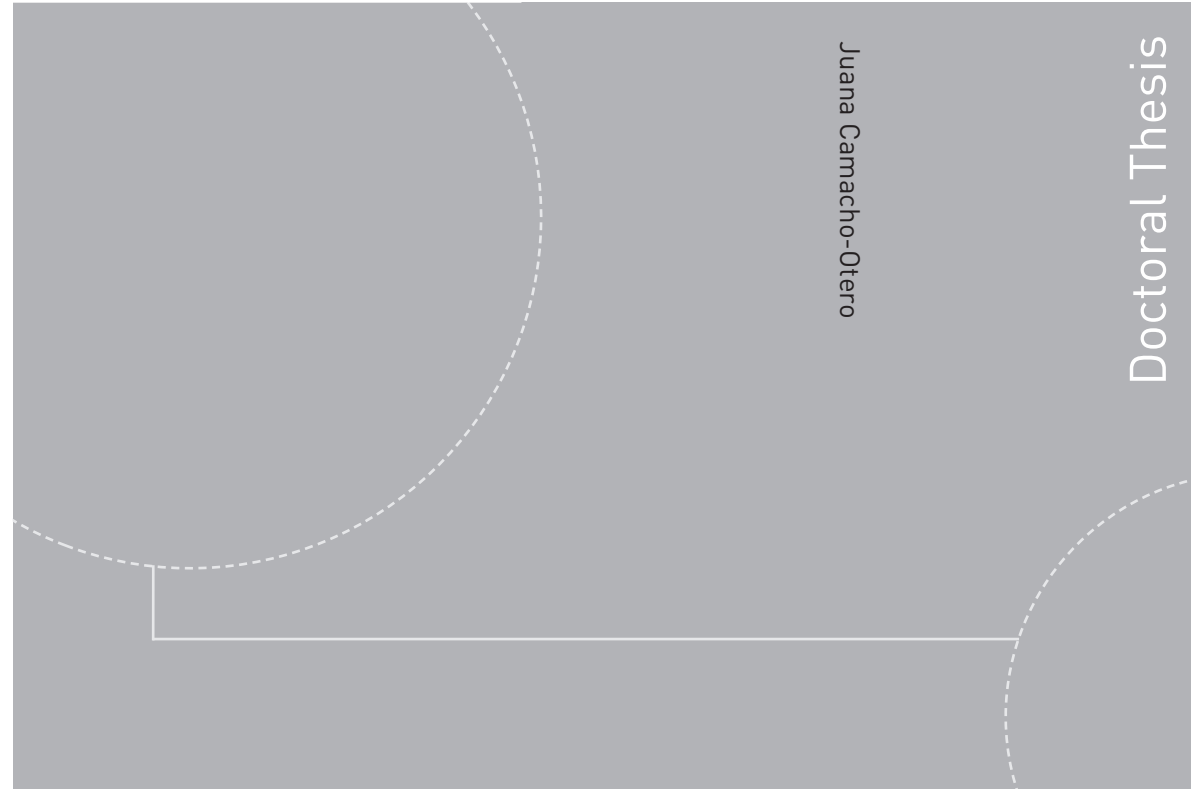| | disagree with the following statements | Sharing consumer goods with others for a fee is a good alternative to ownership. |
		In the future I will share more instead of buying
Contact	If you would like to be interviewed for this research project please fill the following information	Name
		Country
		Email Address
		Phone Number

Juana Camacho-Otero

Redrawing the circle

Integrating a consumption perspective
into the circular economy

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Doctoral Thesis

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