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A System Approach to Sustainable Fashion: What Do We Know and Where Do We Go?

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Abstract

Fashion production and consumption have a large negative impact on the environment. In order to reduce the negative effects of fashion, new sustainable business models (SBMs) have been developed. The question is, however, what insights extant research provides about adopting such SBMs and to what extent SBMs are truly environmentally and financially sustainable. We argue that we can only answer this question by zooming out. Therefore, we take a system approach where we look at the interactions between the different relevant stakeholders in the system. Building on this, our research framework has three premises: (1) we distinguish between necessary and unnecessary clothing, (2) we argue that unnecessary clothing should be Avoided and what is necessary should be Reduced, Reused or Recycled, and (3) we include the three most important actors in the system, i.e., companies, consumers and (N)GOs. To understand the state of the literature on the sustainable fashion industry and to pinpoint where we need to go, we systematically reviewed the literature. Among other things, we find that research has not yet made the distinction between unnecessary vs. necessary clothing and, thus, rarely focused on Avoiding unnecessary consumption. Rather, most research (unintendedly) focused on how current levels of clothing supply and demand can be made more sustainable, rather than addressing the elephant in the room: how can overall levels of production and consumption go down. Thus, the main avenue of future marketing research and practice is to understand why consumers overconsume and the role companies play in it, and how (N)GOs can effectively tackle the culture of overproduction

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and -consumption. By understanding this, researchers can support retailers to create SBMs that are environmentally and financially sustainable.

Introduction

One of the major challenges in the fashion industry is the large impact of production and consumption on the environment. Textile production requires lots of water and uses chemicals and pesticides, produces 10% of global CO_2 emissions, contributes 35% to global micro plastic pollution, and increasingly violates human rights (Ahsmann et al., 2020; Gazzola et al., 2020; McFall-Johnsen, 2019; Niinimäki et al., 2020). This pollution is exacerbated by the fast fashion culture (Demkes, 2021), where fashion companies offer an increasing amount of new collections. From 2000 to 2015, the production of clothing items had doubled (Ellen MacArthur Foundation, 2021). H&M, for instance, offers 12 to 16 new collections a year, Zara introduces 24 new collections each year, and ultrafast fashion company Shein releases 6,000 new styles daily (Allon, 2022; Amed et al., 2023; Remy et al., 2016). Of all these fashion items that companies produce, companies destroy on average 21% before it reaches the consumer market (European Environment Agency, 2024). Fast fashion items that do reach the consumer are usually cheap, of low quality and quickly go out of style (Bhardwaj & Fairhurst, 2010; Kozlowski et al., 2012; Ritch, 2015), which makes it painless for consumers to replace 'old' clothing items with new items (Barnard, 1996; Claudio, 2007). Consequently, consumers end up buying an increasing amount of new clothing items while 85% of replaced items end up in landfills (Ahsmann et al., 2020; Claudio, 2007; Kozlowski et al., 2012; McFall-Johnsen, 2019; Ritch, 2015). To tackle these large negative environmental effects of fashion, the overall goal of this paper is suggest pathways to make fashion more sustainable.

To curb these trends, the UN formulated its SDGs and the EU introduced new policies and legislation which create a new playing field in the near future for fashion retailers. For instance, in anticipation of the EU's strategy for sustainable and circular textiles (European Commission, 2022), the Netherlands has already implemented Extended Producers' Responsibility policies, where companies that offer new clothing items are made responsible for post-consumer waste (Ministerie van Infrastructuur en Waterstaat, 2023). These policies include targets for what percentages of the clothing items sold have to be either reused or recycled in the production of new clothing items (Ministerie van Infrastructuur en Waterstaat, 2023). Another example is the acceptance of a bill that penalizes fast fashion consumption and puts limits on the advertisements of such items in France's lower house of parliament (Reuters, 2024). This bill specifies that consumers will have to pay a tax, going up to €10, per fast fashion item bought (Reuters, 2024).

Such policies create a major challenge as well as an opportunity for retailers to develop new business models that are both environmentally and financially sustainable. Notably, new business models have been developed within the fashion industry with the aim to reduce the negative environmental impact of fashion. We define so-called sustainable business models (SBMs) as business models that create superior customer value and aim to "align interests of all stakeholder groups, and explicitly considers the environment and society as key stakeholders" (Bocken et al., 2014, p.44). Retailers adopt such SBMs in order to make production and/or consumption process of clothing more sustainable (Bocken & Short, 2016). Note that these new SBMs can only have a viable future when they are not only environmentally but also *financially* sustainable (Bocken & Short, 2016). To be environmentally sustainable, we argue that SBMs should tackle the overproduction and - consumption challenges in the fashion industry. To be financially sustainable, SBMs need to

find a balance between catering to the needs of consumers and acting in line with rules governmental institutions impose (e.g., EU legislation). The question is, how.

We argue that the only way to answer this question for retailers is by zooming out. What is needed for the fashion industry –and as such fashion retailers – to be environmentally sustainable is a significant reduction in the volume of clothing. Retailers alone cannot solve this challenge and therefore, we need a system approach (cf. Meadows, 2008). With this approach, we look at different parts of the system and how they interact. This enables us to identify factors (i.e., drivers and barriers) that promote or prevent this reduction and identify the ones that are so-called leverage points, which can lead to a significant change in the behavior of the wider system (Meadows, 2008). More importantly, by providing a systematic literature review we can not only identify the factors but also identify whether academic research is actually studying the potential leverage points. Hence, it allows us to better understand which direction research on fashion retailing should take to enable fashion retailers to become sustainable.

Using this systems approach as a starting point, we build our research framework on three premises. First, in order to be able to change the system, we distinguish between *necessary* and *unnecessary* clothing. We define necessary clothing as those clothing items that fulfill consumers' functional needs (e.g., to stay warm) and we define all other clothing as unnecessary. With this distinction, we acknowledge that consumers simply need clothing and we do not claim that all production and consumption should end. Second, we link the necessary and unnecessary clothing to the *avoid, reduce, reuse* and *recycle* (ARRR) framework (Bocken & Short, 2016; de Aguiar Hugo, 2021; Pal & Gander, 2018). More specifically, we will argue that unnecessary clothing should be Avoided as much as possible, and only necessary clothing should follow the RRR efforts. Third, and directly implied by the system approach, we take a multi-stakeholder perspective and include the most important

stakeholders in the fashion industry: companies, consumers, and (N)GOs. In doing so, we aim to better understand their drivers and barriers towards sustainable clothing as well as how the stakeholders affect each other. Combining these three premises will enable us to find the leverage points that can resolve barriers or enhance drivers which are vital to study to reduce the volume of clothing. As such, it allows us to provide retailers with environmentally as well as financially sustainable business models.

Based on these three premises, we organize our systematic literature review as follows. We first structure our review by the ARRR framework (Bocken & Short, 2016; de Aguiar Hugo, 2021; Pal & Gander, 2018). More specifically, we will study what –if anything– we know about the SBMs based on Avoiding unnecessary clothing and "RRR-ing" what is necessary. Second, for the three most relevant stakeholders –consumers, companies and (N)GOs– we provide a systematic overview of what we know about their roles and drivers and barriers to engage specifically in Avoid vs. RRR efforts. Third, combining insights from the described systematic literature review we provide a concrete research agenda.

Our research extends past reviews (e.g., Arrigo, 2021; de Aguiar Hugo et al., 2021; Gray et al., 2022; Iran & Schrader, 2017; Jia et al., 2020; Nouinou et al., 2023; Park & Armstrong, 2017; Ray & Nayak, 2023; Thorisdottir & Johannsdottir, 2019) by including four different ARRR efforts rather than focusing on a subset and, more importantly, linking them to unnecessary and necessary clothing. Additionally, we broaden the scope by taking a system perspective with the ultimate goal of providing pathways to reducing the volume of clothing whereas past reviews have focused on, for instance, explaining and understanding sustainable fashion concepts or business models (e.g., Arrigo et al., 2021; Park & Armstrong, 2017; Gray et al., 2022; Iran & Schrader, 2017; Thorisdottir & Johannsdottir, 2019). In doing so, we integrate current research within a clear research framework and specify which areas need

further research so that fashion retailers can become environmentally sustainable and financially viable.

Theoretical framework

Previous research on sustainable systems has called for a holistic view where both production and consumption are targeted and multiple stakeholders are taken into account (e.g., Freudenreich & Schaltegger, 2020; Geels et al., 2023; Nenkov, 2024). Therefore, we take a system approach (cf. Meadows, 2008) which is characterized by looking at how parts of a system interact (e.g., Avoid vs. RRR efforts, drivers and barriers) and the feedback loops that occur, rather than focusing on a single part in isolation. This helps us to identify the potential of leverage points that help reaching our ultimate goal: to provide pathways to reduce volume of clothing. This reduction might at first glance feel as an unwelcome message for retailers. However, by taking the system approach we will be able to provide a path forward and identify opportunities for retailers. To give an example of what a system approach entails, we will look at recycling. Retailers can offer recycled clothing, in compliance with the Extended Producers' Responsibility. With a systems lens, we zoom out and look at how the parts of the system interact and do not only consider whether and when companies and consumer adopt recycling efforts. Rather, we identify feedback loops that reinforce clothing overproduction and –consumption due to the low quality recycled clothing (e.g., Peters et al., 2015). The low quality of recycled clothing means that consumers need to replace recycled items sooner than newly produced clothing. To match this increased demand, companies will have to increase their recycling efforts. This shows that offering recycled clothing merely greens overproduction and –consumption and seems to be a suboptimal process that does not help us reach the goal.

From this system approach, three premises follow. The first and most important premise is that in order for the fashion industry to become more sustainable, we argue that we should differentiate between *necessary* and *unnecessary* clothing. We acknowledge people

need clothing to stay warm and protect themselves, so there always will be *necessary* clothing. Nevertheless, given the facts that the sales of clothing has doubled from 2000 to 2015 from approximately 50 billion to 100 billion units, 21% of produced clothing items are destroyed before they reach the consumer, and consumers discard their clothing items after approximately seven wears and do not wear 30% of the items they own (Ellen MacArthur Foundation, 2017; European Environmental Agency, 2024; Maldini et al., 2017), we argue that the majority of current production and consumption is related to clothing that consumers do not necessarily need, i.e., which is *unnecessary*. This implies that in order to understand the true potential of SBMs, we need to differentiate between necessary and unnecessary clothing.

The second premise builds upon this first premise. Because of the distinction between necessary and unnecessary clothing, we structure our research by the so-called ARRR framework (Bocken & Short, 2016; de Aguiar Hugo, 2021; Pal & Gander, 2018). We argue that the Avoid effort is the most important strategy to combat unnecessary clothing. It is important that unnecessary clothing is avoided because any sustainable oriented effort that does not address this will only 'green' overproduction and –consumption rather than tackling it (Wiedman et al., 2020). Furthermore, in the case of necessary clothing, we argue that we should follow the RRR efforts to be considered sustainable. We use the ARRR framework as this one fits our system approach the best and allows us to distinguish between production and consumption-focused SBMs (cf. de Aguiar Hugo et al., 2021; Freudenreich & Schaltegger, 2020) (see Table 1 for a full overview of definitions of each effort). Note that in the past, other frameworks have been developed, such as the take-make-waste or narrowing-slowing-closing frameworks (Brydges, 2021; Pal & Gander, 2018, respectively). These frameworks, however, provide categories that target either production *or* consumption (and not both) and, as such, do not allow for all types of SBMs to be categorized. In comparison to such other

Production vs. consumption	Definition	Source(s)
Avoid		
Production	Avoid overproduction	Bocken & Short, 2016
Consumption	Avoid overconsumption	Bocken & Short, 2016
Reduce		
Production	Reduce the number of raw materials, natural resources and chemicals used in production	Bocken & Short, 2016; de Aguiar Hugo et al., 2021
Consumption	Extend the lifespan of fashion items to reduce consumption by offering services or create added-value to ensure that items are used by the same individual for a long period of time	Freudenreich & Schaltegger, 2020
Reuse		
Production	Reuse natural resources and raw materials in production	Bocken & Short, 2016; de Aguiar Hugo et al., 2021
Consumption	Extend the lifespan of items through facilitating a change in owners or uses of fashion items	Freudenreich & Schaltegger, 2020
Recycle		
Production	Use chemical or mechanical recycling processes to create new fibers or partially disassemble fashion items to produce new items	Bocken & Short, 2016; de Aguiar Hugo et al., 2021
Consumption	Facilitate the creation of upcycled fashion items by consumers themselves	Bocken & Short, 2016; de Aguiar Hugo et al., 2021

frameworks, the ARRR framework has three benefits: (1) it includes all four ARRR efforts rather than just one or two (e.g., Arrigo et al., 2021), (2) it provides a clear hierarchy where avoid is the most and recycle is the least environmentally preferable option (Bocken & Short, 2016), and (3) it allows to distinguish specific efforts based on whether they aim to make the production or consumption process more sustainable.

Table 1: Overview of A vs. RRR efforts and definitions

Since we are looking at the whole fashion system, our third premise is that we focus the three most relevant actors: companies, consumers and (N)GOs. Companies, consumers and (N)GOs influence each other by promoting or hindering the adoption of the Avoid vs. RRR efforts (e.g., Connell, 2010; Pedersen & Andersen, 2015; Pal & Gander, 2018). Additionally, the financial sustainability of SBMs depends on how companies cater to consumers' needs and adhere to legislation. In the current research, we therefore systematically study the roles, drivers and barriers of all three actors to engage in Avoid vs RRR efforts. Note that we are talking about *companies* and not *retailers* specifically. Fashion companies can implement SBMs and these companies are mainly retailers but can also be, for instance, repair shops. Therefore, to include all relevant SBMs mentioned in the literature, we refer to companies rather than retailers specifically.

Based on these three premises, we developed our research framework (see Figure 1). We used this framework to answer the following research questions: 1) What does scientific research tell us about the Avoid vs. RRR efforts used for clothing production and consumption, 2) What does scientific research know about the drivers and barriers of the three different actors regarding Avoid vs. RRR efforts, and 3) What future research questions are necessary to answer in order to reduce the volume of clothing? Answering these questions helps us to understand the fashion system and identify potential leverage points and helps pinpoint where future research on fashion retailing needs to go.
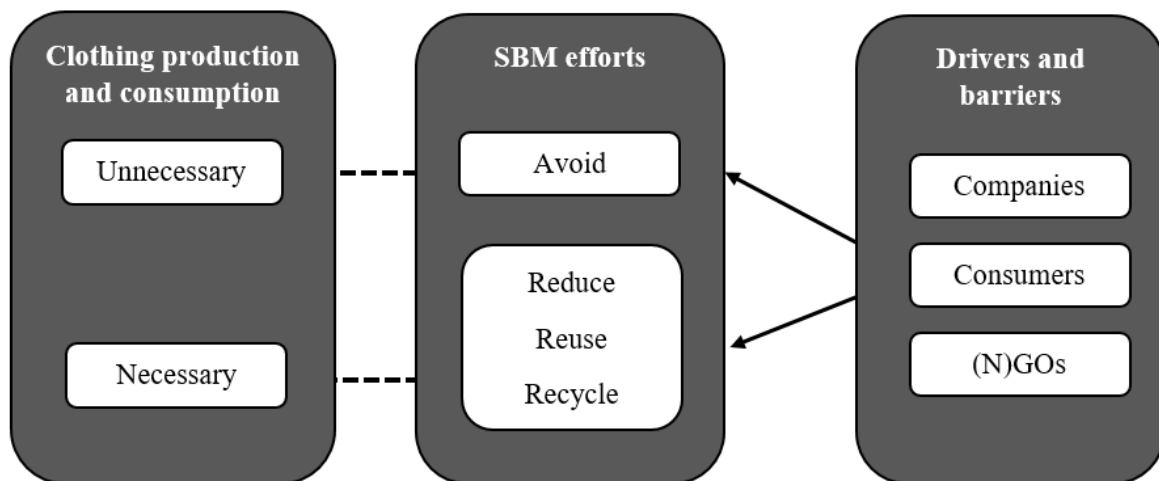

Figure 1: Research framework

Method section

Collecting and analyzing the papers

We follow the six steps procedure described by Littell et al. (2008) on how to conduct a systematic literature review: (1) topic formulation, (2) overall study design, (3) sampling, (4) data collection, (5) data analysis and (6) reporting.

In the first step, we formulated the topic and objective of the systematic literature review: what do we already know about Avoid vs. RRR efforts used for production and consumption-based SBMs, and the drivers and barriers of the three different stakeholders regarding the Avoid vs. RRR efforts. In the second step, we developed a protocol of which studies to include and exclude. We included papers that discussed sustainability in fashion in

terms of business models, consumption practices, or societal matters. We decided on five different exclusion criteria: 1) we excluded technical papers that solely focused on life-cycle assessments or the environmental impact of different fibers as there is disagreement on what tools should be used to assess the environmental impact (e.g., which processes are included or what types of pollution are considered) (e.g., Kozlowski et al., 2012; Levänen et al., 2021; Peters et al., 2015; Roos et al., 2016; Sandin & Peters, 2018; Zamani et al., 2017); 2) we excluded papers that did not provide clear definitions of sustainable fashion since we would not be able to categorize these papers in the ARRR framework[2]; 3) we excluded papers that did not study fashion as a stand-alone context and simultaneously focused on other categories as the analyses and findings were not specific to the fashion context; 4) we excluded other systematic literature reviews; and 5) we excluded papers that discussed strategies that did not fit our ARRR framework. For instance, papers focusing on CSR practices do not fit our ARRR framework (such as donating parts of the sales to charity) as it goes beyond the production and consumption processes and does not necessarily entail environmental sustainability. Additionally, we excluded papers that solely focused on social responsible production (defined as ensuring that the work environment is healthy, safe, and fair, and prevents child labor; Dickson, 2000), as a sustainable strategy, as our ARRR framework focuses on environmental, rather than social, sustainable strategies. Finally, we excluded papers that described supply chain transparency (defined as disclosing the name of suppliers, information about the sustainability conditions and the buying firms' purchasing practices; Egels-Zandén et al., 2015), as being transparent about the supply chain does not automatically mean that the supply chain practices are sustainable (Egels-Zandén et al., 2015). Thus, CSR practices, social responsible production, and transparency do not fit in the ARRR framework.

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[2] For instance, Kumar & Yadav (2021) defined sustainable fashion as "products that have a reduced environmental impact compared to conventional products and offer similar benefits such as functional benefits" (p. 1). Therefore, this definition did not allow us to understand about what type of SBM in relation to the A vs. RRR efforts the authors were referring to and is therefore excluded.

In the third step, sampling, we searched for papers in the International Journal of Research in Marketing, Journal of the Academy of Marketing Science, Journal of Business Ethics, Journal of Business Research, Journal of Cleaner Production, Journal of Consumer Behavior, Journal of Consumer Policy, Journal of Consumer Research, Journal of Marketing, and Journal of Retailing, as these journals are known to publish papers focused on consumers, companies, and/or (N)GOs. The search terms to find relevant papers were variations of the words "sustainability" in combination with "fashion", "clothes", "apparel", and "garment". When databases would provide us with a large result list of papers, as was the case for the Journal of Business Research and Journal of Cleaner production, we specified that the search words had to appear in the title, abstract, and/or keywords of the papers. Finally, we used forward and backward-snowballing techniques to find additional relevant papers.

In the fourth step, we started our search for papers which ended in August 2023. The initial search resulted in 2,003 papers. We assessed the abstracts of these papers and excluded 1,895 papers, resulting in 108 papers. We excluded many papers (1,095) from the Journal of Business Ethics in this step as the search engine did not allow us to search for the search words in the title, abstract, or keywords of papers. We therefore analyzed the abstracts of the first 200 papers that resulted from entering the search words. The last 150 of the 200 papers did not discuss sustainability in the fashion industry and since we sorted the papers based on relevance, we stopped analyzing the abstracts of the remaining papers. This accounts for the majority of papers excluded in this step. We assessed the full 108 papers and excluded 36 papers that did not meet our inclusion criteria provided in Step 2 (e.g., used fashion trends to explain organic food consumption; Fifita et al., 2020), resulting in 72 papers. We added 43 papers based on forward and backward-snowballing techniques, and following our exclusion criteria. In total, we included 115 papers in the final literature review (see Figure 2).
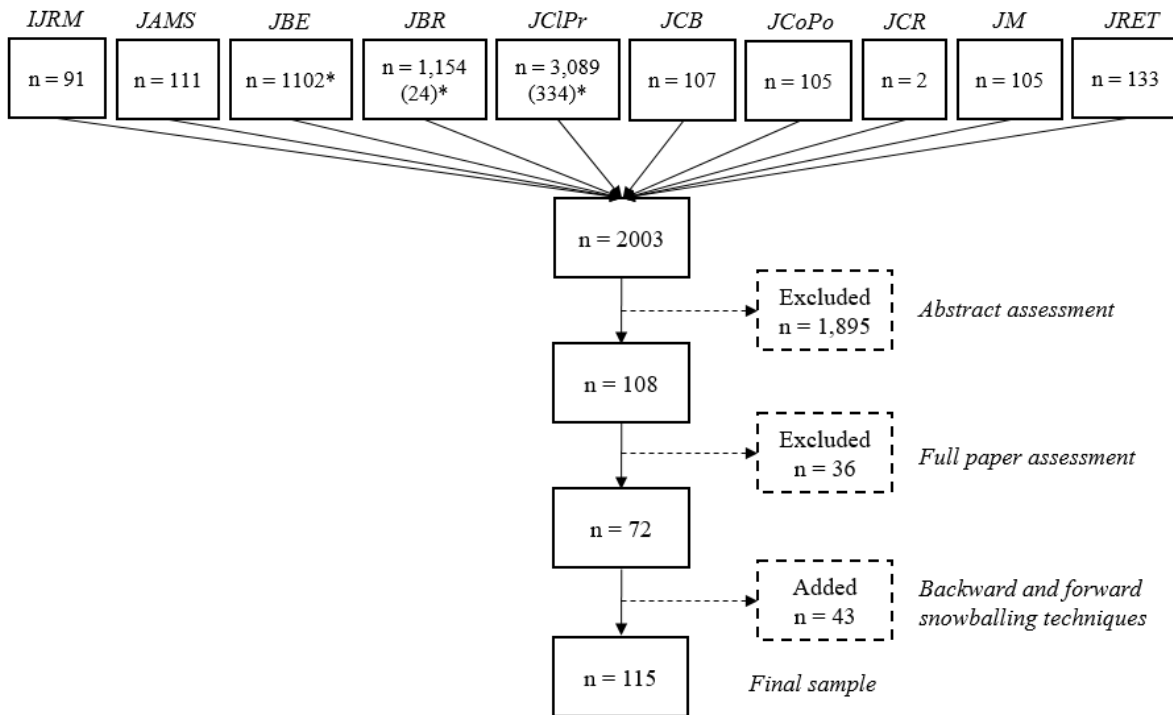
Figure 2: Overview of data collection

Note: IJRM = International Journal of Research in Marketing; JAMS = Journal of the Academy of Marketing Science; JBE = Journal of Business Ethics; JBR = Journal of Business Research; JClPr = Journal of Cleaner Production; JCB = Journal of Consumer Behavior; JCoPo = Journal of Consumer Policy; JCR = Journal of Consumer Research; JM = Journal of Marketing; JRET = Journal of Retailing

*Since the combination of the search terms in these papers were quite large, we specified that the keywords had to appear in the title, abstract, or keywords to make the identification process of relevant papers easier. For Journal of Business Ethics, this was not possible. Therefore, the abstracts of the first 200 papers were screened on relevance.

In the *fifth* step, we analyzed the 115 papers and created an overview based on which A vs. RRR efforts the SBM(s) they discussed. Next, we divided the papers based on which actor(s) they focused on, coded the drivers and barriers of companies and consumers to adopt (from) SBMs (see Appendix A for the coding scheme), and identified what role (N)GOs play.

General descriptives of final sample

The 115 papers in this systematic literature review were published from 2007 onwards (see Figure 3). Over time, the topic of sustainability in fashion regarding the A vs. RRR efforts has gotten more attention, with a peak in 2020 and slowly decreasing from 2021 onwards (note that the collection of papers ended in August 2023 so that the data from 2023 is incomplete). We included papers published in retailing journals but most of the included papers were

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published in production journals, followed by business journals (see Appendix B for an overview of all represented journals).
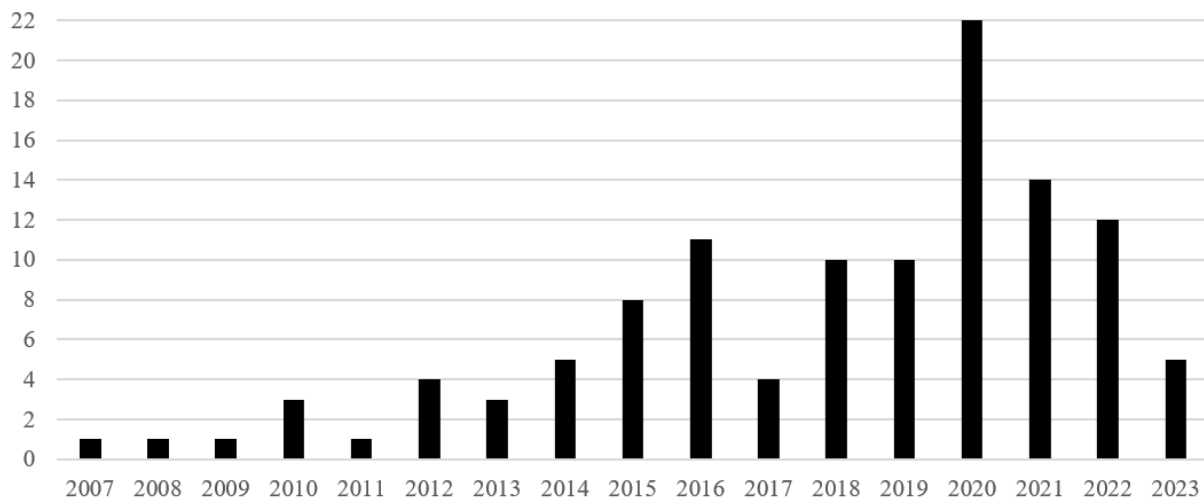

Figure 3: Overview of published papers over the years

Regarding the methods used in the papers, most papers used a quantitative approach (n = 52) and collected data through surveys and experiments. A substantial number of papers took a qualitative approach (n = 43) using (a mix of) case studies, interviews, or focus groups. Additionally, some papers were conceptual in nature (n = 11) and did not collect any data. Finally, a small subset of papers took a mixed approach and used a mix of quantitative, qualitative and conceptual methods (n = 9) (see Appendix C for a detailed overview).

Findings

Research question 1: What does scientific research know about the Avoid vs. RRR-based SBMs used for clothing production and consumption?

To answer our first research question, we first identified the Avoid vs. RRR SBMs adopted in the papers. We did so by carefully comparing the definitions of the SBMs (see Appendix D) with the definitions of the Avoid vs. RRR efforts. Figure 4 provides initial information on how the focus of the articles and chapters on the Avoid vs. RRR SBMs has changed over the years. We see that the Avoid effort has gained the least attention (n = 4; 2.8%) and we do not see any signals of an increasing focus on this strategy. Most papers have focused on the Reduce effort (n = 78; 55.3%), followed by the Reuse (n = 35; 24.8%) and Recycle efforts (n

= 24; 17%)[3]. The categorization of SBMs in the A vs. RRR framework shows us what types of SBMs have already been studied, and what types of SBMs have not. Specifically, we identified a total of 17 different SBMs from the literature: 1 in the avoid category, 10 in the reduce category, 3 in the reuse category, 3 in the recycle category (see Table 3 for the classification and Appendix E for the sources).
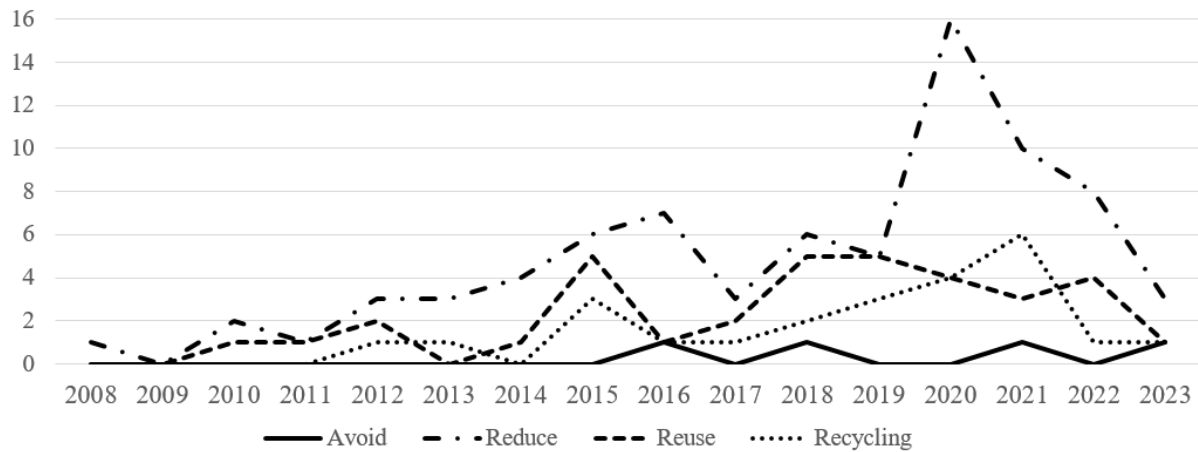

Figure 4: Overview of Avoid vs. RRR research over the years

SBMs in fashion	Frequency*	Production	Consumption
Avoid based strategies			
Sufficiency	4		x
Reduce based strategies			
Sustainable production	33	x	
Organic materials	24	x	
Slow fashion	20	x	x
Repair services	13		x
Clothing longevity	11		x
Luxury fashion	10		x
Make it yourself (MIY)	6		x
Customized, participatory design	5		x
Consulting services	2		x
Capsule wardrobe	1		x
Reuse based strategies			
Second-hand fashion	23		x
Rental services	19		x
Swapping	14		x
Recycle based strategies			
Recycled fashion	25	x	
Company upcycled fashion	6	x	
Consumer upcycled fashion	1		x

Table 3: Overview of SBMs mentioned in the literature, ranked by the number of times they have been mentioned in the analyzed papers
* How many papers discussed the specific SBM (note that some papers discuss multiple SBMs)

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[3] Note that the total of these strategies is more than the 115 papers we included because several papers discuss multiple SBMs *across* different A vs. RRR efforts. The percentages are based on the total number of times the efforts are mentioned, which is 136 times.

Surprisingly and in contrast with our first premise, research does not distinguish between necessary and unnecessary clothing. In other words, research does not focus on Avoiding unnecessary clothing and RRR-ing what is necessary. Additionally, only few papers ($n = 4$) describe an SBM that adheres to the avoid effort in general: a sufficiency business model. This SBM aims to avoid unnecessary consumption and make sure that consumers only buy what they need rather than what they want (Frick et al., 2021a; Garcia-Ortega et al., 2023; Hwang et al., 2016; Pal & Gander, 2018). Note that this definition only includes the consumption of clothing and does not explain whether unnecessary production is also avoided. Intuitively, one might argue that a decrease in consumption levels results in a decrease in production levels as well. This is, however, not evident from the literature even though it is important to include following our system approach.

Our analysis shows that past research has focused mainly on SBMs which are based on RRR efforts (16 out of 17). Insights of this research can, in line with our second premise, facilitate the improvement in the domain of necessary clothing. Looking at the literature, we have four more observations. First, most research focused on whether and when companies and consumers adopted Avoid vs. RRR SBMs by looking at their drivers and barriers, which we will discuss in more depth in the next section. Second, some research has also focused on the outcomes of adopting an SBM for companies, such as the financial performance (Hayat et al., 2020; Pedersen et al., 2018; Rese et al., 2022) and environmental performance, measured by, for instance, the water pollutants released in production (Chen et al., 2023; Hayat et al., 2020; Rese et al., 2022). Third, research focused on consumers generally used purchase intentions or willingness-to-pay as dependent variables to measure consumer interest in consuming from SBMs (e.g., Cervellon et al., 2012; Colasante & D'Adamo, 2021; Grazzini et al., 2021; Jung & Jin, 2016; Lang, 2018; Park & Lin, 2020). Finally, most RRR SBMs aim to tackle the sustainability issues in consumption rather than in production (12 vs. 4 SBMs

respectively; see Table 3). Note that we excluded technical papers that focused on the production-side as they tended to provide life-cycle analyses or calculate the impact of specific fibers, rather focusing on the business model behind it. In other words, most studied SBMs only urge consumers to engage in RRR efforts but do not clean up and limit their own production process. One exception to this is the research that focuses on slow fashion, which aims to ensure a sustainable production process and sustainable consumption practices (Clark, 2008; Fletcher, 2010). Excluding these papers could have led to few papers focusing on the production side. Nevertheless, it still shows that past research provides more insights on different ways SBMs can make consumption, rather than production, more sustainable.

Research question 2: What does scientific research know about the drivers and barriers of the three different actors regarding Avoid vs. RRR efforts?

Before diving into the specifics of the drivers and barriers, we first show how many papers focused on the drivers and barriers of companies and consumers, and the role of (N)GOs. We found that most of the included papers focus on consumers ($n = 58$; 64.4%), followed by companies ($n = 19$; 21.1%) and fewest papers focused on (N)GOs ($n = 13$; 14,4%)[4]. Lately, this consumer focus is declining, whereas research is starting to pay more attention to the role of (N)GOs (see Figure 5). This skewed distribution also affects the level of knowledge about barriers and drivers of these stakeholders, as we will show in the next section.

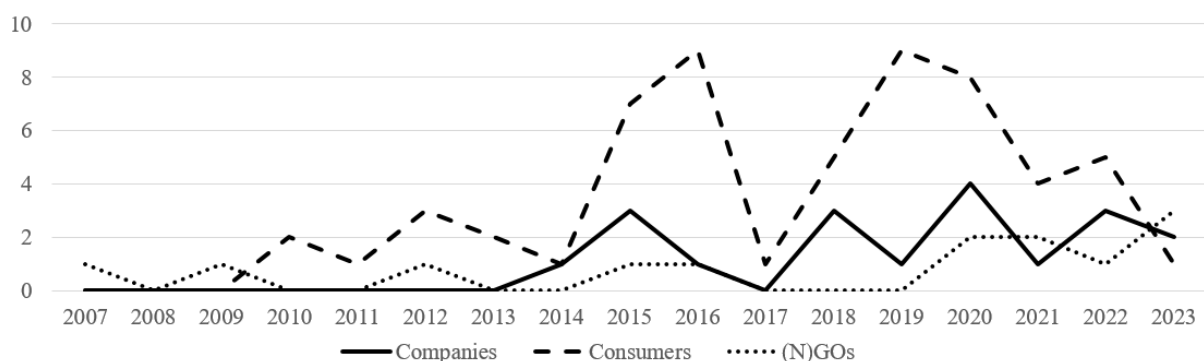*Figure 5: Overview of company, consumer, and (N)GO perspective over the years*

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[4] Note that this does not amount to 116 papers as some papers only focused on explaining certain SBMs, without taking a specific company, consumer, or (N)GO perspective.

When talking about companies, we only refer to companies that manufacture and offer clothing items to consumers or those that only offer it to consumers, and do not refer to those that only manufacture it (i.e., manufacturers). The papers that we found in our initial search that focused on manufacturers, solely discussed social responsibility (e.g., Akbar & Ahsan, 2019; Fontana & Egels-Zandén, 2019; Huq & Stevenson, 2020), with the exception of Karmaker et al (2023). Since we excluded social responsibility from our framework, we did not include research that discussed manufacturers[5]. From our system approach, including manufacturers would improve our understanding of the fashion system, especially since the fashion supply chain is highly fragmented and most companies contract manufacturers for the production of clothing items (Barnes & Lea-Greenwood, 2006). Hence, understanding the manufacturers could highlight potential leverage points. Nevertheless, companies like retailers generally hold the power in the supply chain and can thus control how manufacturers produce clothing (Laudal, 2010). Thus, understanding leverage points on the company-level can also result in a change in the way manufacturers produce clothing.

We coded the drivers and barriers of companies and consumers discussed in the next section into internal (forces that are unique to a company or consumer) and external (macro-level forces that company or consumer typically cannot control) drivers and barriers (cf. Connell, 2010). In the short term, retailers can more easily act upon consumers' external drivers and barriers as they probably can help create and/or resolve them. In the long run, they can also act upon consumers' internal as well as their own internal drivers and barriers. Thus, this categorization in internal and external drivers and barriers helps us to better understand the interplay between actors and what might be immediately actionable and what takes time.

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[5] The paper of Karmaker et al (2023) is included in the literature review but only in which A vs. RRR SBM they focused. We did not include their results in the drivers and barriers of companies as this would complicate the results, since all other papers focused on companies who offer clothing items rather than the companies that manufactured it.

As mentioned before, few papers (n = 4) have focused on an SBM that exerts Avoid efforts: a sufficiency SBM (Frick et al., 2021a; Garcia-Ortega et al., 2023; Hwang et al., 2016; Pal & Gander, 2018). This makes that currently, the scientific literature provides little information about the different drivers and barriers and roles of the three actors. We will discuss what research mentioned below.

Companies

Research focusing on companies has identified no drivers and one internal barriers to the adoption of Avoid efforts: the *dynamic preferences of consumers* (see Table 4). Companies believe that consumers constantly want to chase new trends and styles and, as a result, are not interested in sustainable fashion (Pal & Gander, 2018). These dynamic preferences of consumers makes that companies would forego revenues and are therefore reluctant to adopt Avoid efforts (Pal & Gander, 2018).

SBMs in fashion	Drivers						Barriers						
	Internal				External		Internal				External		
	Internal values and support	Financial gain	Growth potential	More certainty	Governmental pressures and support	Stakeholder pressure	Costs of coordination	Limited resources and capabilities	Financial priorities	Resistance to change	Dynamic consumer preferences	Uncertainty and risks	Inconsistent stakeholder pressures
Avoid													
Sufficiency											x		
Reduce													
Sustainable production	x	x			x	x	x	x	x	x	x	x	x
Organic materials	x				x		x			x	x		
Slow fashion	x			x			x		x		x		
Repairs	x				x		x				x		
Clothing longevity	x						x	x	x		x		
Reuse													
Second-hand fashion	x		x		x		x				x		
Rental services	x				x		x	x			x	x	
Swapping	x				x		x					x	
Recycle													
Recycled fashion	x				x	x	x	x		x	x		
Company upcycled fashion	x				x		x				x		
Driver/barrier for how many SBMs	*10*	*1*	*1*	*1*	*8*	*2*	*9*	*4*	*3*	*3*	*10*	*3*	*1*
*Mentioned by how many papers** *	*7*	*2*	*1*	*1*	*3*	*2*	*4*	*5*	*4*	*1*	*2*	*3*	*1*

Table 4: Drivers & barriers of companies to adopt Avoid vs. RRR efforts (see Appendix F for the sources)

Consumers

Research that focuses on consumers has identified one internal driver and two internal barriers for consumers to exert avoid efforts, and no external drivers or barriers (see *Table 5*). The internal driver is that of *self-transcendence values*: when consumers care about the environment and others (de Groot & Steg, 2008), they are more likely to adopt

SBMs in fashion	Drivers									Barriers									
	Internal								External	Internal							External		
	Environmental benefit	Self-transcendence values	Fulfills fashion needs	High perceived value	Fashion involvement	Financial benefit	Personal benefit	Preference for long life-time	Supporting norms	Fashion needs	Limited knowledge and awareness	Skepticism	Low perceived value	Unreasonable responsibility	Self-enhancement values	Brand attitude	Price	Lack of accessibility	Social pressures
Avoid																			
Sufficiency		x													x	x			
Reduce																			
Sustainable production	x	x	x	x	x	x	x	x	x	x	x	x		x			x		
Organic materials	x	x	x	x	x	x	x	x		x	x	x	x	x	x		x	x	x
Slow fashion	x	x	x	x	x	x	x	x		x	x	x					x	x	
Repairs	x		x		x					x	x	x					x	x	x
Clothing longevity	x			x	x		x			x	x	x					x		
Reuse																			
Second-hand fashion	x	x	x		x	x	x		x	x	x	x	x	x	x		x	x	x
Rental services	x	x	x	x	x	x			x	x	x	x					x	x	x
Swapping		x	x		x			x	x	x	x	x	x	x			x	x	x
Recycle																			
Recycled fashion	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x	x
Company upcycled fashion	x	x	x	x					x	x	x	x							
Driver or barrier for how many SBMs?	*9*	*9*	*8*	*8*	*8*	*7*	*6*	*5*	*6*	*10*	*10*	*10*	*5*	*5*	*3*	*1*	*9*	*7*	*6*
Mentioned by how many papers?	*15*	*15*	*16*	*11*	*8*	*12*	*4*	*5*	*7*	*14*	*11*	*10*	*12*	*1*	*3*	*1*	*17*	*12*	*10*

Table 5: Drivers & barriers of consumers to adopt Avoid vs. RRR efforts (see Appendix J for the sources)

Avoid efforts (Frick et al., 2021a; Hwang et al., 2016). The first internal barrier is that of *self-enhancement*; when consumers have high egoistic and hedonistic values, they are less likely to adopt avoid efforts (Frick et al., 2021a). *Brand attitude* is the second internal barrier, when consumers have positive brand attitudes, they are more likely to purchase clothing from a brand (Hwang et al., 2016). Even though this can be considered as positive, Hwang et al (2016) show that consumers have higher purchase intentions when they have positive brand attitudes rather than solely buying what they need. Thus, brand attitude might be one of the

drivers of unnecessary clothing consumption, which can get in the way of the effectiveness of Avoid efforts. From our system approach, this shows that even though the mindset of companies towards consumption has changed (they want to motivate consumers to buy only what they need and not what they want), it does not necessarily mean that the mindset of consumers has changed as well.

Taking consumers' three internal drivers and barriers together, we observe that research has mainly focused on internal values and attitudes that are not easily changed by companies in the short term. Companies can, however, play into consumers' existing values with their marketing campaigns to promote the adoption of Avoid efforts (e.g., Frick et al., 2021a; Hwang et al., 2016).

Finally, some papers focused on consumers avoiding consumption in general rather than avoiding unnecessary consumption (Frick et al., 2021b; Joanes, 2019; Joanes et al., 2020; Joyner Armstrong et al., 2016; Nielsen & Hoffmann, 2021; Ruppert-Stroescu et al., 2015; Thornquist, 2018). Even though these papers did not relate the Avoid effort to an SBM, they do provide insights into the factors and interventions might help or hinder consumers to reassess their consumption habits, as well as the consequences of refraining from consumption. However, since they do not relate to an SBM, we will not discuss these papers in depth.

(N)GOs

No research explicitly discussed the role of (N)GOs to Avoid unnecessary clothing production and consumption. In fact, most research on (N)GOs was not clear about whether they focused on the Avoid vs. RRR efforts. When looking at the content of the papers that discus (N)GOs, they seem to fit the RRR efforts better than the A efforts. Therefore, we will discuss the role of (N)GOs in the next section

Research on three actors and the RRR efforts

Most of the papers focused on the RRR strategies (recycle: *n* = 75; reuse: *n* = 35; recycle: *n* = 24). This makes that we have, relatively, more knowledge about the drivers and barriers of companies and consumers to engage in the RRR efforts and the role of (N)GOs. Therefore, we will only discuss those drivers and barriers that occur for all three RRR efforts. Additionally, as most research focused on consumers (*n* = 58) we found more drivers and barriers than presented in Table 5. The extended table of drivers and barriers, including those that did not occur for all three RRR efforts, can be found in Appendix G and Appendix H respectively.

As can be seen in Table 4 and Table 5, not all RRR SBMs previously identified are included. Following our systemic approach, we decided to only include those SBMs that were discussed from both a company and consumer perspective. In total, we left six SBMs out of our discussion. More specifically, two SBMs (i.e., *Luxury fashion* and *Capsule wardrobes*) were left out as research has not focused on company or consumer drivers and barriers in general, and four SBMs (i.e., *Make it yourself*, *Customized, participatory design*, *Consulting services*, *Consumer upcycled fashion*) were left out as they were only discussed from a consumer perspective (see Appendix F and Appendix G for the extended tables for drivers and barriers respectively, which include latter four these SBMs).

Companies

Research on companies has identified two drivers and three barriers for companies when exerting the RRR efforts (see Table 4). Regarding the drivers, research has identified one internal and one external driver. First, when companies have *internal values and support* from top management that are in line with sustainability, a company is more likely to adopt RRR efforts (Cooper & Claxton, 2022; Goworek et al., 2020; Gray et al., 2022; Jia et al., 2020; Pedersen et al., 2018; Rese et al., 2022; Stål & Corvellec, 2018). Such values are difficult to create or change in the short term but developing them in the long turn could provide an

important leverage point. Second, the external driver of *governmental pressures and support* can also drive the adoption of RRR efforts (Rese et al., 2022; Stål & Corvellec, 2018). Research has not, however, provided empirical evidence about the effectiveness of specific policies, such as taxes and subsidies, but merely suggests that they can drive adoption.

Research has also identified two internal and one external barriers for companies to the adoption of the RRR efforts. First, research suggests that companies believe that the *costs of coordination* are too high as the supply chain is not transparent and often involves a range of sub-contractors, which makes them reluctant to adopt RRR SBMs (Goworek et al., 2020; Harris et al., 2016; Ertekin & Atik, 2015; Pal & Gander, 2018; Pedersen & Andersen, 2015). Second, research has found that companies do not adopt RRR SBMs because they have *limited resources and capabilities* (Colucci et al., 2020; Cooper & Claxton, 2022; Hayat et al., 2020; Pal & Gander, 2017; Pedersen & Netter, 2015). For instance, companies argue that they do not have the financial resources or technological capabilities to adopt an RRR SBM (e.g., Hayat et al., 2020; Pedersen & Netter, 2015). Finally, the external barrier to adopting RRR SBMs, just like for the Avoid SBM, is that companies believe that *consumers have dynamic preferences* (Brydges, 2021; Pal & Gander, 2018).

Consumers

For consumers, research has identified various drivers and barriers to engage in RRR efforts (see *Table 5*). The internal drivers relate to consumers' values, traits, needs, and attitudes. First, just like the driver of companies' values, consumers' *self-transcendence values* are suggested to drive the adoption of RRR efforts (e.g., Diddi et al., 2019), just like the Avoid efforts. Second, consumers' traits, that is, their *fashion involvement* and the fact that they are more focused on style rather than trends, is also suggested to be a driver for engaging in the RRR efforts (e.g., Cho et al., 2015). This suggests that there is a group of consumers that is interested in sustainable fashion and that not all consumers have dynamic preferences, as

companies tend to believe. Third, consumers' *fashion needs* can drive engagement in the RRR efforts as it provides, for instance, unique clothing items and a way for consumer to express themselves (e.g., Armstrong, 2015; Park & Lin, 2020). Finally, consumers' attitudes, such as the perceived *environmental*, *financial* and *personal benefits* and their *preference for a long life-time* of clothing items drives the engagement in RRR efforts (e.g., Diddi et al., 2019; Lundblad & Davies, 2016).

Research has found one external driver of engaging in the RRR efforts, *supporting norms* (e.g., Frommeyer et al., 2022; Lang & Joyner Armstrong, 2018). Thus, when consumers believe others also engage in or accept engagement in the RRR efforts, they are more likely to engage in RRR efforts (e.g., Frommeyer et al., 2022; Lang & Joyner Armstrong, 2018).

The internal barriers also relate to consumers' needs, attitudes, and knowledge. First, even though consumers' *fashion needs* can serve as a driver, they can also serve as a barrier to RRR adoption. Consumers believe, for instance, that engaging in the RRR efforts will result in less fashionable clothing and does not fulfill their desire for newness, change and variety (e.g., Diddi et al., 2019; Joyner Armstrong et al., 2016), in line with what companies believe. Second, consumers attitudes, such as their believes that clothing offered by RRR SBMs has *low functional value*, hindering the adoption of RRR efforts (e.g., Clube & Tennant, 2020). Additionally, some consumers believe that it is *unreasonable* that they are held *responsible* to change the fashion system through consumption, which hinders the engagement in RRR efforts (Markkula & Moisander, 2012). Third, consumers' *limited knowledge and awareness* about the (un)sustainability of clothing items, can serve as a barrier to engage in the RRR efforts (e.g., Connell, 2010). When consumers are aware and do have knowledge about the (un)sustainability of clothing items, they can potentially be skeptical about the true

environmental impact of RRR efforts, which hinders engagement (e.g., Armstrong et al., 2015; Jain et al., 2023).

There are also three external barriers that consumers experience. First, consumers perceive that the *price* of engaging in the RRR efforts is either too high or less cost effective compared to fast fashion items (e.g., Connell, 2010; McKeown & Shearer, 2019). Second, consumers the RRR efforts *lacks accessibility*, hindering their ability to engage in the efforts (e.g., Armstrong et al., 2016; Connell, 2010). Finally, consumers also experience *social pressures* to keep consuming fast fashion items (e,g, Diddi et al., 2019; Joyner Armstrong & Park, 2020).

Looking at the all the drivers and barriers research has identified for consumers, we see that we know more about the internal drivers and barriers that are not easily changed in the short term. Nevertheless, they might highlight important leverage points in the long term.

(N)GOs

As mentioned above, the role of (N)GOs has been discussed by only 13 papers and has not been explicitly related to the Avoid vs. RRR efforts. Additionally, these papers did not include empirical evidence on the effectiveness of specific (N)GO-level policies or interventions. Therefore, the interventions and policies discussed next are *proposed* interventions and policies, we do not understand the effectiveness of specific policies yet. One of the mentioned roles of (N)GOs is that they can create awareness and educate consumers about the (un)sustainability of clothing (Birtwistle & Moore, 2007; Ertekin & Atik, 2020; McEachern et al., 2020; Morgan & Birtwistle, 2009; Sun et al., 2021; West et al., 2021). Research argues, however, that the role of (N)GOs should go beyond educating, towards 'hard' policies, like taxation and legislation, and systemic measures that fix the fundamental flaws in the system (Markkula & Moisander, 2012; Pedersen & Andersen, 2015). Such policies and subsidies could help companies towards a sustainable transition (Chen et al.,

2023; Ertekin & Atik, 2020; Karmaker et al., 2023; Zor, 2023). The challenge for such policies, however, is that it can not reach the whole globalized clothing supply and demand chain as it is widespread over countries and continents (Boström & Micheletti, 2016).

NGOs, in turn, can work together with companies to support them (Oliveira Duarte et al., 2022) or pressure them to adopt SBMs through, for instance, boycotts (Boström & Micheletti, 2016; Ertekin & Atik, 2020)

Discussion and Future Research Agenda

We started this systematic literature review by taking a system approach (cf. Meadows, 2008) to provide pathways to reduce the volume of clothing. In doing so, we built our research framework around three premises: we (1) distinguish between necessary and unnecessary clothing, (2) argue that unnecessary clothing should be Avoided and what it is necessary should follow the RRR efforts, and (3) include the most important actors in the fashion system: companies, consumers and (N)GOs. We used this framework to systematically analyze the literature and distinguish areas that require further research. This research agenda thereby highlights potential leverage points that need better understanding as they enable tipping the fashion system towards being more sustainable.

Unnecessary vs. necessary consumption

As mentioned, our systematic literature review shows that research does not distinguish between necessary and unnecessary clothing. This results in suboptimal SBMs where unnecessary clothing is being greened, rather than Avoided. Thus, with the upcoming EU regulations in mind (European Commission, 2022), current SBMs might not be sufficient. Following our research framework, we argue that unnecessary clothing should be Avoided and that what is necessary should follow the RRR efforts. To understand whether consumers only buy what is necessary, and thus Avoid what is unnecessary, research should focus on more broadly defined dependent variables. Right now, most research focuses on consumers' purchase intentions and willingness-to-pay when studying the A vs. RRR efforts (e.g.,

Cervellon et al., 2012; Colasante & D'Adamo, 2021; Grazzini et al., 2021; Jung & Jin, 2016; Lang, 2018; Park & Lin, 2020). These dependent variables, though interesting, only tell us about whether consumers would consume sustainable fashion and do not tell us how many clothing items consumers would consume or whether it replaces fast fashion. If sustainable clothing is complementary to buying fast fashion or high amounts of sustainable clothing are consumed, unnecessary consumption is not Avoided. This idea resonates with research in other areas which showed that the warm glow people get from recycling potentially increases overall consumption levels and thus ironically leads to more waste (van Doorn & Kurz, 2021). In a similar vein, consuming sustainable fashion might give people a warm glow (or what we observed in our systematic literature review, a guilt-free conscience; Bly et al., 2015; Lundblad & Davies, 2016), which could result in them consuming *more* fashion items, because it makes them feel good or less guilty. Thus, consumers might keep consuming what is unnecessary and Avoiding unnecessary clothing is not on the top of their minds as an environmentally responsible act. Even when consumers are prompted with an anti-consumption ad, Hwang et al (2016) found that some participants with high environmental values would still buy the advertised clothing item as they believed it was environmentally responsible to do so. Thus, future research should focus on the unintended consequences of feedback loops resulting from SBMs and their communications.

Moreover, looking at companies, research has mainly focused on their environmental and financial performance. When estimating the environmental performance, no measures of how much clothing items are produced are included, nor any measures of how many clothing items are destroyed before they reach the consumer. We recognize that such numbers are hard to estimate as companies are generally not eager to share these numbers (European Environment Agency, 2024). They would, however, provide insights into whether unnecessary production is Avoided or not, which could have consequences for the extent to

which consumers will Avoid unnecessary consumption. Future research should study how measures on the production-side to Avoid unnecessary production affect consumers' consumption levels and whether it motivates them to Avoid unnecessary consumption.

Avoid SBMs

The systematic literature review showed there is little knowledge about Avoid SBMs and that research has mainly focused on the RRR efforts. Currently, it is hard to think beyond replacing fast fashion and instead ask what it is that consumers need and how we can provide that in a sustainable way. Avoid SBMs require a new fashion mindset where unnecessary clothing is Avoided. The SBMs found in the literature (see Table 3) can serve as a starting point for Avoid SBMs. For instance, research currently describes consulting SBMs (now categorized as a Reduce SBM) as giving consumers advice on how to style the clothing item they already own and what new items would go with it (Armstrong et al., 2015, 2016). This SBM could be transformed into an Avoid SBM when the company does not offer new clothing items to consumers. Rather, consumers would get advice on how to style the clothing they already own differently, avoiding the production and consumption of (new) clothing altogether. Future research could study whether companies are interested and ready for such new ways to offer fashion services. For this to work, both researchers and companies should view the role of companies as broader than just selling and focus more on the extended offering. Another are for future research is to investigate whether consumers are interested in consuming fashion in new ways and whether it fulfills their current needs. Additionally, it is important to study the effects of such SBMs and whether it reduces unnecessary clothing consumption in the long run.

Consumers' needs in fashion

For Avoid SBMs to be effective, or any SBM for that matter, they should fulfill consumers' needs in fashion. As mentioned in the findings, companies are reluctant to adopt Avoid vs. RRR SBMs as they believe consumers have dynamic preferences and do not want it. We

observed that consumers' needs can both drive and hinder the adoption of RRR efforts. We argue that this might be due to the underlying reasons why people consume fashion in the first place. Future research could focus on these underlying reasons by looking at what needs consumers try to fulfill with fashion consumption. Some initial suggestions are that consumers use fashion to express their identity (Thompson & Haytko, 1997). In order to express their identity, consumers are assumed to have a need for trendiness, uniqueness and constant change in fashion (e.g., Armstrong et al., 2015), an assumption that has not been empirically tested. Future research could focus on whether adopting Avoid vs. RRR efforts is able to fulfill consumers' current needs or whether new needs have to be created to ensure sustainable consumption patterns.

An important notion here is that a distinction between *needs* and *wants* is necessary. In line with our paper, we could argue that with needs, we refer to consumers' functional needs and that all other needs are wants. Nevertheless, Kotler et al (2023) define needs as states of deprivation of physical (e.g., food and warmth), social (e.g., belonging and affection), and individual needs (e.g., self-expression) and wants as the translated needs that are influenced by people's environments (e.g., a jacket from a specific brand in order to meet social standards). Clothing could be argued to be able fulfill all of these needs and, following this reasoning, it is not the needs that are problematic, but the wants are.

Building on this, future research could focus on where consumers' needs in fashion come from, what specific forces in their environment contribute to this. A fair assumption is that companies have played a role in creating, or at least reinforcing, consumers' needs via advertising. Thus, rather than being passive actors and pointing to the fact that consumers are not interested, companies have the potential to be proactive. This idea fits in Galbraith's (1999) theory on the origin of consumer demand, which argues that advertising can create the needs it says it is going to fulfill. Indeed, many advertisements paint a certain ideal situation

("express yourself") and provide consumers ways to reach that ideal situation (buy our fashion). Thus, future research could focus on how companies' advertising campaigns have fueled consumers' needs in fashion. This provides opportunities to potentially create new, more sustainable, needs through advertising campaigns.

The effectiveness of interventions and policies

Next to the potential leverage points already discussed above, we observed that research has also suggested some other leverage points, although they were not referred to as such. First, research has suggested that companies and (N)GOs can provide consumers with information (e.g., Birtwistle & Moore, 2007; Connel, 2010; Sun et al., 2021) to ensure they make more informed decisions. Future research could focus on the effectiveness of providing information, as this might not be straightforward. Based on the findings of the systematic literature review, signaling the sustainability of clothing items might evoke negative associations with regards to the ability of sustainable clothing to fulfill consumers' needs. Additionally, notions of sustainability can lead to skepticism. Thus, rather than overcoming consumers' barriers, providing information might reinforce existing or create new barriers. Nevertheless, providing information could be effective for those consumers who believe that sustainable fashion fulfills their fashion needs or those that prioritize environmental over personal goals when they consume clothing (e.g., Cho et al., 2015; Harris et al., 2016). Thus, future research could also focus on what type of information works best for which consumer groups. This could also be studied in combination with community building or a challenge, where consumers are challenged to not consume any clothing for a number of weeks (cf. Joyner Armstrong et al., 2016; Ruppert-Stroescu et al., 2015). Adding to the research of Joyner Armstrong et al (2016) and Rupper-Stroescu et al (2015), it is interesting to see what happens after the challenge of refraining from consumption and how information could help to make sure people's behaviors truly change over time.

Second, companies could reduce the price or increase the accessibility of sustainable clothing, including options to maintain clothing pieces for a longer period (e.g., via repair) to overcome external consumer barriers (e.g., Goworek et al., 2012; Ertekin & Atik, 2015). These might seem like easily implemented by retailers but it is important to keep in mind that they can also be used to ensure mindful consumption. It might be that when clothing items are more expensive, consumers value it more and take better care of it (as, for instance, is the case with luxury fashion items; e.g., Sun et al., 2021; Turunen et al., 2020) Nevertheless, lowering the price and making sustainable fashion more accessible could be acceptable actions, but only when the underlying mindset of overconsumption is addressed as well. In other words, it could work in a system where unnecessary production and consumption is avoided and there is only production and consumption of what is necessary. Future research could investigate how lowering the price of sustainable fashion items and increase the availability without fueling overconsumption of unnecessary items.

Third, research has suggested that governments can intervene to change the fashion system, but without explaining what specific policies and regulations to implement (e.g., Markkula & Moisander, 2012; Zor, 2023). Much like the other interventions mentioned, it is also important to understand the effectiveness of specific policies and regulations. To the best of our knowledge, research has not empirically investigated the effectiveness yet. Take for instance the Extended Producer's Responsibility we mentioned before, where, among other things, companies are made responsible for recycling discarded clothing and use this in the production of new clothing. For companies, such policies directly affect the production. In addition to what was mentioned in the *Theoretical framework*, recycling poses challenges as most clothing items consist of mixed fibers that cannot always be separated which is necessary for recycling (Peters et al., 2015). Additionally, to make up for the low quality of recycled clothing, companies will likely need an inflow of newly produced clothing or raw

materials. Thus, recycling seems to be a suboptimal process that cannot fully replace the traditional fashion production system.

Consumers are indirectly affected by such policies. As mentioned, the lower quality of recycled clothing can fuel overconsumption as well as the act of consuming recycled clothing or bringing back 'old' clothing to be recycled could fuel overconsumption due to the positive feelings it elicits (e.g., Bly et al., 2015; Lundblad & Davies, 2016; van Doorn & Kurz, 2021). Because of these positive feelings, consumers might to start to prefer and prioritize recycling even when more sustainable options are available (e.g., Barnett et al., 2023; van Doorn & Kurz, 2021). Thus, future research should take a system approach and study the feedback loops of such policies to understand their potential to reduce the volume of clothing.

Limitations

Our research has several limitations. First, in our research we focused on identifying pathways to reduce the volume of clothing. To do so, we provided an overview of all drivers and barriers. However, we did not provide an answer to the question of which drivers and barriers are the most prevalent. This was also not needed to develop these pathways. Nevertheless, this could be explored more in-depth with our suggestions for future research.

Another limitation is that we were limited to the definitions of sustainable fashion that research provided. Some included papers gave definitions that related to multiple SBMs, sometimes spanning different Avoid vs. RRR efforts. For instance, Cho et al (2015) refer to sustainable fashion as containing organic or recycled materials, and sustainable production processes and Gwozdz et al (2017) add second-hand or long-lasting clothing items to this definition. Nevertheless, we included these papers and analyzed them from our research framework and categorized them in the different SBMs that they mentioned (which could span different Avoid vs. RRR efforts). For instance, the findings of Cho et al (2015) were categorized into organic materials (Reduce), sustainable production processes (Reduce), and

recycled materials (Recycle). However, we acknowledge that there is some form of subjectivity here due to potential differences in the interpretation.

Conclusion

We took a system approach in order to find research gaps that identify leverage points that can reduce the negative environmental impact of fashion. We find that research does not distinguish between necessary and unnecessary clothing and that little research focused on Avoid SBMs. Rather, research has focused more on how overproduction and –consumption can be greened. This knowledge is unlikely to make the clothing industry more sustainable, as it does not address the elephant in the room: overproduction and -consumption. Thus, future research should focus on why consumers overconsume and the role companies play in it, and how (N)GOs can effectively fulfill their roles. As a result, researchers can support retailers to create SBMs that are environmentally and financially sustainable and show them a path forward.

Declaration of Generative AI and AI-assisted technologies in the writing process

Statement: During the preparation of this work the author(s) used ChatGPT in order to improve the readability of some of the sentences. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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Appendix A – Coding scheme

Companies

Drivers	
Internal	
Internal values, support and knowledge	(1) Values of flexibility and discretion, (2) normative (norms), (3) cognitive processes (beliefs), (4) technical skills, (5) knowledge in new product development, (6) green creativity, (7) knowledge about factors driving sustainable buying, (8) deliver high quality, (9) increase number of times items are worn
Financial gain	(1) Financial gain
Growth potential	(1) Platforms are growing fast, (2) scalable in short term
More certainty	(1) More certainty
External	
Governmental pressures and support	(1) Regulative (rules), (2) compliance to laws and regulations
Stakeholder pressures	(1) Pressures from stakeholders (government, media, NGOs, consumers), (2) stakeholder criticisms
Barriers	
Internal	
Costs of coordination	(1) Costs of coordination, (2) constrained by structures limiting agency, (3) lack of transparency
Limited resources and capabilities	(1) Technological limitations, (2) Limited financial resources, (3) limited human resources, (4) Time, (5) technological constraints, (6) resource constraints, (7) machinery (usually old and environmentally unfriendly)
Financial priorities	(1) Financial priorities, (2) costs, (3) investment costs
Resistance to change	(1) Resistance to change, (2) institutional inertia
External	
Dynamic consumer preferences	(1) Immiscibility restricted consumption, (2) consumer preferences, (3) dynamic consumer preferences
Uncertainty and risks	(1) Risk of damaged items, (2) uncertain supply, (3) uncertainties
Inconsistent stakeholder pressures	(1) Inconsistency within stakeholder groups

Table A1: Coding scheme for companies' drivers and barriers

Consumers

Drivers	
Internal	
Environmental benefit	(1) Environmental benefit, (2) reduced consumption, (3) eco-efficacy, (4) good for environment, (5) reduced purchases, (6) outcome efficacy, (7)

	sustainability, (8) efficacy beliefs, (9) perceived consumer effectiveness
Fashion involvement	(1) More innovative, (2) personal relevance, (3) fashion leadership, (4) focus on personal style rather than trends, (5) Style orientation, (6) clothing style confidence
Financial benefit	(1) Low price, (2) not having to invest, (3) saving money, (4) smarter purchasing, (5) economic motives, (6) opportunity to wear clothes otherwise unaffordable, (7) price, (8) low cost
Self-transcendence values	(1) Self-transcendence values, (2) past sustainable behaviors, (3) environmental values, (4) concern for workers, (5) sustainability commitment, (6) sustainability attitude
Fulfills fashion needs	(1) Chance to explore trends, (2) desire for change, (3) finding personal style, (4) self-expressiveness, (5) desire for fashion (uniqueness, different styles, unique colors), (6) unique items/design, (7) versatility if items, (8) nostalgia, (9) new clothes for actual need, (10) experiment and play with different clothes, (11) finding one's own style, (12) enabling variety of clothing, (13) access to clothing according to changing needs, (14) well-fitting clothes
Personal benefit	(1) Feeling of accomplishment - guilt free conscience & good feeling, (2) health benefits, (3) sense of well-being, (4) self-transformation (brings positive image, confidence, status)
High perceived value	(1) High quality perception, (2) high value perception, (3) product satisfaction potential (e.g., achieving better fit), (4) potential emotional value, (5) personalization and storytelling
Political consumerism	(1) Political consumerism/consumption
Preference for long life-time	(1) Preference for durability, (2) preference for timeliness
Attitude towards brand	(1) Perception of warmth of company
Attitude towards sustainable fashion	(1) Attitude towards sustainable fashion
Demographic characteristics	(1) Gender, (2) age
External	
Supporting norms	(1) Supporting subjective norm, (2) support of micro-celebrity/influencer, (3) social norms, (4) subjective norms
Experience enjoyment	(1) Experience enjoyment, (2) social interaction, (3) social value (being part of something), (4) sense of community
Ease of use	(1) Ease of use, (2) save time, (3) perceived behavioral control
Product characteristics	(1) Status brand, (2) high initial price of garment, (3) design
Barriers	
Internal	
Fashion needs	(1) Desire for newness, (2) wanting to change, (3) wanting variety of clothes, (3) functional needs (worn out/special occasion), (4) less stylish/aesthetically pleasing, (5) pleasure of acquiring clothes, (6) sustainable fashion is out there (not high street alternative), (7) Lack of fit with personal fashion goals/image, (8) absence of personalized range, (9) loss of individuality, (10) loss of self-esteem, (11) unnecessary for every day wear, (12) desire to express social identity, (13) aesthetic dilemma, (14) limitation in degree of ability to express of self-identity
Limited knowledge and awareness	(1) Limited knowledge, (2) lack of skills, (3) Limited awareness, (4) unfamiliarity
Skepticism	(1) Skepticism, (2) lack of trust in provider, (3) fair price concerns, (4) environmental unsustainable
Habits	(1) Habits, (2) consumption habits
Unreasonable responsibility	(1) Unreasonable responsibility
Low perceived value	(1) Concerns about comfort, (2) concerns about fit, (3) contamination concerns, (4) performance risks, (5) low perceived value, (6) functional concerns, (7) functional risks, (8) hygiene risks, (9) poor product quality and cleanliness
Self-enhancement values	(1) Self-enhancement values, (2) limitation in degree of self-enhancement,
Brand attitude	Brand attitude
Materialistic values	(1) Materialistic values, (2) importance of ownership, (3) emotional

	detachment, (4) no ownership (so no nostalgia), (5) lack of ownership
Perceived distance to negative effects	(1) Perceived distance to negative effects
External	
Lack of accessibility	(1) Hard to use, (2) lack of availability, (3) lack of convenience, (4) less ideal for everyday clothing, (5) lack of accessibility, (6) inconvenience, (7) time availability, (8) Lack of local shops and accessibility, (9) lack of product availability, (10) availability of time for personal shopping
Price	(1) High price, (2) low cost-effectiveness, (3) garments are not durable, (4) perceived high costs, (5) monetary risk, (6) expensive, (7) economic trade-off, (8) value for money and it's getting to expensive, (9) value for money
Social pressures	(1) Social pressures (for appearance), (2) social pressures (social norm against sustainable fashion), (3) societal pressures (to keep consuming), (4) social risk, (5) peer pressure, (6) perception of it being low-class, (7) low social acceptance
Fast fashion culture	(1) Availability of fast fashion, (2) consumers are used to planned obsolescence
Not a pleasurable experience	(1) Not a pleasurable experience, (2) social interaction, (3) smell (old and musty), (4) lack of servicability

Table A2: Coding scheme for consumers' drivers and barriers

Appendix B – Overview of journals

Journal/publication*	# of papers included
Production journals	**41**
Journal of Cleaner Production	38
Sustainable Production and Consumption	3
Business journals	**21**
Journal of Business Ethics	7
Journal of Business Research	14
Consumer journals	**23**
International Journal of Consumer Studies	8
Journal of Consumer Behavior	7
Journal of Consumer Policy	5
Journal of Environmental Psychology	3
Fashion journals	**12**
Journal of Fashion Marketing and Management	7
Fashion Theory	2
Clothing and Textiles	1
Fashion and Textiles	1
Fashion Practice	1
Sustainability journals	**7**
Sustainability	4
Sustainable Development	2
Journal of Sustainability Research	1
Marketing journals	**5**
Journal of Macromarketing	3
International Journal of Research in Marketing	1
Journal of Marketing	1
Retailing journals	**4**
International Journal of Retail & Distribution Management	3
Journal of Retailing and Consumer Services	1
Other	**2**
International Journal of Market Research	2

Table B1: Overview of journals in which the included papers were published

* Note that no papers published in the Journal of Consumer Research and Journal of Retailing are included in the systematic literature review as these journals did not publish papers that fitted the scope of this paper

Appendix C – Overview of methods

Method applied	Total
Quantitative	**52**
Survey	37
Experiments	13
Secondary data	1
Mixed quantitative methods	1
Qualitative	**43**
Interviews	11
Case study	10
Mixed qualitative methods	9
Content analysis	8
Focus groups	5
Conceptual	**11**
Conceptual	10
Modelling	1
Mixed	**9**
Interview and survey	3
Focus groups, interviews, and survey	2
Content analysis and secondary data	2
Content analysis and survey	1
Interviews, content analysis, and survey	1

Table C1: Overview of the methods used by the included papers

Appendix D – Definitions of SBMs

Production vs. consumption	SBM	Definition	Sources
Avoid			
Consumption	Sufficiency	Consumption is guided by consumers' needs and not wants to avoid overconsumption	Hwang et al., 2016
Reduce			
Production	Sustainable production	Adopt environmentally preferable production processes, which reduces the amount of materials, water and chemicals used	e.g., Brydges, 2021; Connell, 2010
Production	Organic materials	Use organic materials in production that are cultivated without the use of pesticides	e.g., Connell, 2010; Goworek et al, 2012
Both	Slow fashion	Offer fashion items that are made with all stakeholders in mind, that do not follow trends, are locally made, are priced reflecting the true cost, and last a long time	Clark, 2008; Fletcher, 2010
Consumption	Repair services	Offer services to mend damaged fashion items so that they can be used again	e.g., Diddi et al., 2019; Freudenreich & Schaltegger, 2020
Consumption	Clothing longevity	Offer fashion items that are seasonless and of high quality	e.g., Freudenreich & Schaltegger, 2020; Goworek et al., 2012
Consumption	Luxury fashion	Offer high-end fashion items that are seasonless and of high quality, and premium priced	e.g., Joy et al., 2012; Sun et al., 2021
Consumption	Make it yourself	Help consumers make fashion items themselves at home	Armstrong et al., 2015; Hirscher et al., 2018
Consumption	Customized, participatory design	Consumers customize the fit and style to their wishes together with the company/designer	Armstrong et al., 2015
Consumption	Consulting services	Offer consumers advice on how to wear new fashion items in different ways and how to style the fashion items already owned	Armstrong et al., 2015
Consumption	Capsule wardrobe	Offer consumers possibility to create a so-called 'capsule wardrobe', where consumers own a	Bardey et al., 2022

		reduced set of clothing items, which are usually created each season (every 3 months)	
Reuse			
Consumption	Second-hand fashion	Offer fashion items previously owned by other consumers in exchange for money	Cervellon et al., 2012; Joyner Armstrong & Park, 2020
Consumption	Rental services	Offer fashion items for rent for a short or longer period of time	e.g., Clube & Tennant, 2020; Pedersen & Netter, 2015
Consumption	Swapping	Facilitate the exchange of fashion items by letting consumers exchange clothing items for other clothing items	e.g., Armstrong et al., 2015
Recycle			
Production	Recycled fashion	Offer fashion items made from recycled materials	e.g., Gwozdz et al., 2017; Moosmayer et al., 2019;
Production	Company refurbished fashion	Companies disassemble old clothing items and redesign them into new items	Park & Lin, 2020
Consumption	Consumer refurbished fashion	Provide consumers with resources and opportunity to use components of old clothing items into new designs	McEachern et al., 2020

Table D1: Definitions of the identified SBMs

Appendix E – Sources of identified SBMs

SBM	Freq.	Sources
Avoid		
Sufficiency	4	Frick et al., 2021a; Garcia-Ortega et al., 2023; Hwang et al., 2016; Pal & Gander, 2018
Reduce		
Sustainable production	33	Alexander, 2020; Brydges, 2021; Chen et al., 2023; Cho et al., 2015; Colucci et al., 2020; Connell, 2010; Ferioli et al., 2022; Feuß et al., 2022; Freudenreich & Schaltegger, 2020; Frommeyer et al., 20221; Garcia et al., 2019; Guedes et al., 2020; Gwozdz et al., 2017; Hayat et al., 2020; Jung et al., 2020; Karmaker et al., 2023; Kong et al., 2021; Li et al., 2016; Lundblad & Davies, 2016; Mann et al., 2014; Markkula & Moisander, 2012; McNeill & Moore, 2015; Miotto & Youn, 2020; Oliveira Neto et al., 2021; Olson, 2022; Pal & Gander, 2018; Pedersen et al., 2018; Pedersen & Gwozdz, 2014; Sun et al., 2020; Talay et al., 2020; Vătămănescu et al., 2021; Wang et al., 2019; Wong & Ngai, 2021
Organic materials	23	Achabou & Dekhili, 2013; Austgulen, 2016; Brand & Rausch, 2021; Brydges, 2021; Cho et al., 2015; Colasante & D'Adamo, 2021; Connell, 2010; Diddi et al., 2019; Feuß et al., 2022; Garcia et al., 2019; Goworek et al., 2012; Gwozdz et al., 2017; Jacobs et al., 2018; Jung et al., 2016; Lee et al., 2020; Lundblad & Davies, 2016; Markkula & Moisander, 2012; McKeown & Shearer, 2019; Oliveira Duarte et al., 2022; Olson, 2022; Pal & Gander, 2018; Rese et al., 2022; Vătămănescu et al., 2021
Slow fashion	18	Clark, 2008; Fletcher, 2010; Freudenreich & Schaltegger, 2020; Gray et al., 2022; Gupta et al., 2019; Henninger et al., 2016; Jung & Jin, 2014, 2016; Legere & Kang, 2020; Lundblad & Davies, 2016; Niinimäki, 2010; Niinimäki & Hassi, 2011; Olson, 2022; Ertekin & Atik, 2015; Pal & Gander, 2018; Pookulangara & Shephard, 2013; West et al., 2021; Zarley Watson & Yan, 2013
Repair services	12	Armstrong et al., 2015, 2016; Brydges, 2021; Diddi et al., 2019; Freudenreich & Schaltegger, 2020; Goworek et al., 2012; Gray et al., 2022; Gwozdz et al., 2017; McEachern et al., 2020; McNeill et al., 2020; Pal & Gander, 2018; Stål & Corvellec, 2018
Clothing longevity	11	Bly et al., 2015; Brydges, 2021; Cooper & Claxton, 2022; Diddi et al., 2019; Freudenreich & Schaltegger, 2020; Goworek et al., 2012, 2020; Gray et al., 2022; Gwozdz et al., 2017; Joyner Armstrong et al., 2018; Pal & Gander, 2018
Luxury fashion	10	Achabou & Dekhili, 2013; Amatulli et al., 2020; De Angelis et al., 2017; Freudenreich & Schaltegger, 2020; Janssen et al., 2014; Joy et al., 2012; Karaosman et al., 2020; Kong et al., 2021; Sun et al., 2021; Yang et al., 2017
Make-it-yourself	6	Armstrong et al., 2015, 2016; Bly et al., 2015; Freudenreich & Schaltegger, 2020; Hirscher et al., 2018; Niinimäki & Hassi, 2011
Customized, participatory design	5	Armstrong et al., 2015, 2016; Freudenreich & Schaltegger, 2020; Hirscher et al., 2018; Niinimäki & Hassi, 2011
Consulting services	2	Armstrong et al., 2015, 2016
Capsule wardrobe	1	Bardey et al., 2022
Reuse		

Second-hand fashion	20	Bly et al., 2015; Brydges, 2021; Cervellon et al., 2012; Colasante & D'Adamo, 2021; Connell, 2010; Diddi et al., 2019; Freudenreich & Schaltegger, 2020; Gray et al., 2022; Gupta et al., 2019; Gwozdz et al., 2017; Hur, 2020; Iran et al., 2019; Iran & Schrader, 2017; Jain et al., 2022; Joyner Armstrong & Park, 2020; Khitous et al., 2022; Markkula & Moisander, 2012; McNeill & Moore, 2015; Stål & Corvellec, 2018; Xu et al., 2014
Rental services	18	Armstrong et al., 2015, 2016; Becker-Leifhold, 2018; Brydges, 2021; Clube & Tennant, 2020; Freudenreich & Schaltegger, 2020; Gray et al., 2022; Gwozdz et al., 2017; Iran & Schrader, 2017; Jain et al., 2023; Khitous et al., 2022; Lang, 2018; Lang & Joyner Armstrong, 2018; Laukkanen & Tura, 2022; Niinimäki & Hassi, 2011; Pal & Gander, 2018; Pedersen & Netter, 2015; Shrivastava et al., 2021
Swapping	12	Armstrong et al., 2015, 2016; Gray et al., 2022; Gupta et al., 2019; Gwozdz et al., 2017; Henninger et al., 2019; Iran et al., 2019; Iran & Schrader, 2017; Khitous et al., 2022; Lang & Joyner Armstrong, 2018; Lang & Zhang, 2019; Markkula & Moisander, 2012
Recycle		
Recycled fashion	21	Achabou & Dekhili, 2013; Armstrong et al., 2015; Brand & Rausch, 2021; Brydges, 2021; Cho et al., 2015; Diddi et al., 2019; Freudenreich & Schaltegger, 2020; Grazzini et al., 2021; Gwozdz et al., 2017; Karmaker et al., 2023; Kong et al., 2021; Lundblad & Davies, 2016; Markkula & Moisander, 2012; Moosmayer et al., 2019; Pal & Gander, 2018; Park & Lin, 2020; Rese et al., 2022; Stål & Corvellec, 2018; Vătămănescu et al., 2021; Wang et al., 2019; Wong & Ngai, 2021
Company refurbished fashion	4	Armstrong et al., 2015; Freudenreich & Schaltegger, 2020; Park & Lin, 2020; Stål & Corvellec, 2018
Consumer refurbished fashion	1	McEachern et al., 2020

Table E1: Sources of the identified SBMs

Appendix F – Sources of companies' drivers and barriers

Drivers & barriers		Sources
Drivers		
Internal	Internal values & support	Cooper & Claxton, 2022; Goworek et al., 2020; Gray et al., 2022; Pedersen et al., 2018; Rese et al., 2022; Stål & Corvellec, 2018
	Financial gain	Freudenreich & Schaltegger, 2020; Pal & Gander, 2018
	Growth potential	Gray et al., 2022
	More certainty	Ertekin & Atik, 2015
External	Governmental pressures and support	Rese et al., 2022; Stål & Corvellec, 2018
	Stakeholder pressures	Colucci et al., 2020; Pedersen & Gwozdz, 2014
Barriers		
Internal	Costs of coordination	Goworek et al., 2020; Ertekin & Atik, 2015; Pal & Gander, 2018
	Limited resources and capabilities	Colucci et al., 2020; Cooper & Claxton, 2022; Hayat et al., 2020; Pal & Gander, 2017; Pedersen & Netter, 2015
	Financial priorities	Chen et al., 2023; Cooper & Claxton, 2022; Goworek et al., 2020; Ertekin & Atik, 2015
	Resistance to change	Pal & Gander, 2018
External	Dynamic consumer preferences	Brydges, 2021; Pal & Gander, 2018
	Uncertainty and risks	Chen et al., 2023; Gray et al., 2022; Henninger et al., 2019
	Inconsistent stakeholder pressures	Pedersen & Gwozdz, 2014

Table F1: Sources of the identified companies' drivers and barriers

Appendix G – Extended table of consumers' drivers to adoption

SBMs in fashion	Drivers															
	Internal												External			
	Environmental benefit	Self-transcendence values	Fulfills fashion needs	High perceived value	Fashion involvement	Financial benefit	Personal benefit	Preference for long life-time	Political consumerism	*Attitude towards sustainable fashion*	*Demographic characteristics*	*Attitude towards brand*	Supporting norms	*Experience enjoyment*	*Ease of use*	*Product characteristics*
Avoid																
Sufficiency		x														
Reduce																
Sustainable production	x	x	x	x	x	x	x	x	x				x			
Organic materials	x	x	x	x	x	x	x	x	x	*x*						*x*
Slow fashion	x	x	x	x	x	x	x	x	x							
Repairs	x		x			x										*x*
Clothing longevity	x			x	x		x									
Make it yourself					*x*		*x*							*x*		
Customized, participatory design		*x*	*x*	*x*										*x*		
Consulting services	*x*		*x*	*x*		*x*								*x*		
Reuse																
Second-hand fashion	x	x	x		x	x	x			*x*	*x*		x	*x*	*x*	
Rental services	x	x	x	x	x	x					*x*		x	*x*	*x*	
Swapping		x	x		x				x	*x*	*x*		x	*x*	*x*	
Recycle																
Recycled fashion	x	x	x	x	x	x	x	x	x			*x*	x			*x*
Company upcycled fashion	x	x	x	x									x			

Table G1: Extended table of consumers' drivers to adoption

Note: the drivers and SBMs in bold and italics are added in this extended table.

* Luxury fashion, Capsule wardrobe, and Consumer refurbished/upcycled fashion are not included, as research has not looked into consumers' drivers of consuming from these SBMs

Appendix H – Extended table of consumers' barriers to adoption

SBMs in fashion	Barriers														
	Internal										External				
	Fashion needs	Skepticism	Limited knowledge and awareness	Low perceived value	Unreasonable responsibility	Self-enhancement values	Habits	Brand attitude	*Perceived distance to negative effects*	*Materialistic values*	Price	Lack of accessibility	Social pressures	Fast fashion culture	*Not a pleasurable experience*
Avoid															
Sufficiency						x		x							
Reduce															
Sustainable production	x	x	x		x		x				x				
Organic materials	x	x	x	x	x	x			*x*		x	x	x	x	
Slow fashion	x	x					x		*x*	*x*	x	x		x	
Repairs	x	x	x								x	x	x		
Clothing longevity	x	x	x								x			x	
Make it yourself		*x*							*x*			*x*			
Customized, participatory design											*x*	*x*			
Consulting services											*x*	*x*			
Reuse															
Second-hand fashion	x	x	x	x	x	x			*x*		x	x	x		*x*
Rental services	x	x	x	x						*x*	x	x	x		
Swapping	x	x		x	x						x	x	x		*x*
Recycle															
Recycled fashion	x	x	x	x	x						x	x	x	x	
Company upcycled fashion	x	x													
Consumer upcycled fashion	*x*											*x*	*x*		

Table H1: Extended table of consumers' barriers to adoption

Note: the drivers and SBMs in bold and italics are added in this extended table.

* Luxury fashion and Capsule wardrobe are not included, as research has not looked into consumer's barriers of adopting from these SBMs

Appendix J – Sources of consumers' drivers and barriers

Drivers & barriers		Sources
Drivers		
Internal	Environmental benefit	Armstrong et al., 2015, 2016; Brand & Rausch, 2021; Cervellon et al., 2012; Colasante & D'Adamo, 2021; Diddi et al., 2019; Gray et al., 2022; Jain et al., 2022; Jung et al., 2016; Khitous et al., 2022; Laukkanen & Tura, 2022; Legere & Kang, 2020; Lundblad & Davies, 2016; Park & Lin, 2020; Xu et al., 2014
	Self-transcendence values	Becker-Leifhold, 2018; Cervellon et al., 2012; Diddi et al., 2019; Frick et al., 2021a; Frommeyer et al., 2022; Henninger et al., 2019; Hwang et a., 2016; Jacobs et al., 201f8; Jain et al., 2022; Lang & Joyner Armstrong, 2018; Lundblad & Davies, 2016; Niinimäki, 2010; McNeill & Moore, 2015; Moosmayer et al., 2019; Park & Lin, 2020
	Fulfills fashion needs	Armstrong 2015, 2016; Becker-Leifhold et al., 2018; Cervellon et al., 2012; Diddi et al., 2019; Henninger et al., 2019; Jain et al., 2022 Khitous et al., 2022; Lang & Joyner Armstrong, 2018; Lang & Zhang, 2019; Laukkanen & Tura, 2022; Lundblad & Davies, 2016; Park & Lin, 2020; Pedersen & Netter, 2013; Xu et al., 2014; Zarley Watson & Yan, 2013
	High perceived value	Armstrong et al., 2015, 2016; Colasante & D'Adamo, 2021; Diddi et al., 2019; Goworek et al., 2012; Jain et al., 2023; Jung & Jin, 2016; Lundblad & Davies, 2016; Niinimäki & Hassi, 2011; Park & Lin, 2020; Zarley Watson & Yan, 2013
	Fashion involvement	Becker-Leifhold, 2018; Bly et al., 2015; Cervellon et al., 2012; Cho et al., 2015; Gupta et al., 2019; Jacobs et al., 2018; Joyner Armstrong et al 2018; Lang & Joyner Armstrong, 2018; Lundblad & Davies, 2016
	Financial benefit	Armstrong et al., 2015, 2016; Cervellon et al., 2012; Diddi et al., 2019; Jain et al., 2022; Khitous et al., 2022; Lang, 2018; Laukkanen & Tura, 2022; Lundblad & Davies, 2016; Pedersen & Netter, 2015; Xu et al., 2014; Zarley Watson & Yan, 2013
	Personal benefit	Bly et al., 2015; Legere & Kang, 2020; Lundblad & Davies, 2016; McNeill & Moore, 2015
	Preference for long life-time	Gray et al., 2022; Jacobs et al., 2018; Lundblad & Davies, 2016; Zarley Watson & Yan, 2013
	Political consumerism	Austgulen, 2016; Lundblad & Davies, 2016; Ertekin & Atik, 2015
	Attitude towards sustainable fashion	Iran et al., 2019; Jacobs et al., 2018
	Demographic characteristics	Armstrong et al., 2016; Khitous et al., 2022
	Attitude towards brand	Grazzini et al., 2021
External	Supporting norms	Becker-Leifhold, 2018; Frommeyer et al., 2022; Iran et al., 2019; Lang & Joyner Armstrong, 2018; Park & Lin, 2020; Shrivastava et al., 2021; Xu et al., 2014
	Experience enjoyment	Armstrong et al., 2015, 2016; Cervellon et al., 2012; Henninger et al., 2019; Jain et al., 2022; Khitous et al., 2022; Lang & Zhang, 2019; Laukkanen & Tura, 2022; Niinimäki & Hassi, 2011; Pedersen & Netter, 2015; Xu et al., 2014
	Ease of use	Frommeyer et al., 2022; Iran et al., 2019; Laukkanen & Tura, 2022
	Product characteristics	Brand & Rausch, 2021; McNeill et al., 2020
Barriers		
Internal	Fashion needs	Armstrong et al., 2015; Bly et al., 2015; Connell, 2010; Diddi et al., 2019; Henninger et al., 2016; Hur, 2020; Jain et al., 2023; Lang, 2018; Markkula & Moisander, 2012; McEachern et al., 2020; McNeill & Moore, 2015; Ertekin & Atik, 2015; Pookulangara & Shephard, 2013
	Skepticism	Armstrong et al., 2015, 2016; Bly et al., 2015; Diddi et al., 2019; Goworek et al., 2012; Jain et al., 2023; Joyner Armstrong & Park, 2020; McNeill & Moore, 2015; Ertekin & Atik, 2015
	Limited knowledge and awareness	Armstrong et al., 2015; Bly et al., 2015; Connell, 2010; Diddi et al., 2019; Garcia et al., 2019; Goworek et al., 2012; Garcia et al., 2019; Jain et al., 2023; McNeill & Moore, 2015
	Low perceived value	Armstrong et al., 2015, 2016; Clube & Tennant, 2020; Colasante & D'Adamo, 2021; Connell, 2010; Diddi et al., 2019; Gray et al., 2022;

		Gwozdz et al., 2017; Hur, 2020; Jain et al., 2023; Lang, 2018; Lang & Zhang, 2019
	Unreasonable responsibility	Markkula & Moisander, 2012
	Self-enhancement values	Frick et al., 2021a; Hur, 2020; Jacobs et al., 2018
	Habits	McNeill & Moore, 2015; Ertekin & Atik, 2015
	Brand attitude	Hwang et al., 2016
	Perceived distance to negative effects	Bly et al., 2015; Ertekin & Atik, 2015
	Materialistic values	Armstrong et al., 2015; Jain et al., 2023; Lang & Joyner Armstrong, 2018; Ertekin & Atik, 2015
External	Price	Armstrong et al., 2015, 2016; Connell, 2010; Diddi et al., 2019; Goworek et al., 2012; Gray et al., 2022; Henninger et al., 2019; Hur, 2020; Jain et al., 2023; Joyner Armstrong & Park, 2020; Lang, 2018; Markkula & Moisander, 2012; McKeown & Shearer, 2019; McNeill & Moore, 2015; Ertekin & Atik, 2015; Pookulangara & Shephard, 2013
	Lack of accessibility	Armstrong et al., 2015, 2016; Becker-Leifhold, 2018; Connell, 2010; Diddi et al., 2019; Goworek et al., 2012; Henninger et al., 2019; Hur, 2020; Jain et al., 2023; McEachern et al., 2020; McKeown & Shearer, 2019; Ertekin & Atik, 2015
	Social pressures	Bly et al., 2015; Cervellon et al., 2012; Connell, 2010; Diddi et al., 2019; Hur, 2020; Jain et al., 2023; Joyner Armstrong & Park, 2020; Lang & Zhang, 2019; McEachern et al., 2020; Xu et al., 2014
	Fast fashion culture	Gray et al., 2022; Niinimäki, 2010
	Not a pleasurable experience	Armstrong et al., 2015, 2016; Connell, 2010; Hur, 2020; McNeill & Moore, 2015

Table J1: Sources of identified consumers' drivers and barriers

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