Transitioning the Fashion Industry towards Sustainability

by

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AUTHOR'S DECLARATION

This thesis consists of material all of which I authored or co-authored: see Statement of Contributions included in the thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

STATEMENT OF CONTRIBUTIONS

I am the sole author of all chapters, with the exception of chapter 2, of this dissertation. Chapter 2 is based on a co-authored manuscript with Dr. Olaf Weber. However, I was the lead author for this manuscript. This manuscript is submitted as follows:

Weber, S., & Weber, O. (submitted). *Fashion and Textiles (FTEX)*.

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Weber, S. (2019). A circular economy approach in the luxury fashion industry: A case study of Eileen Fisher. In M. A. Gardetti & S. S. Muthu (Eds.), *Sustainable Luxury* (pp. 127-160). Berlin, Germany: Springer.

Weber, S. (2019). A structural impact analysis of the fashion system with regards to textile recycling. *World Review of Science, Technology and Sustainable Development, 15*(1), 87-113.

ABSTRACT

A growing body of literature addresses fashion industry's sustainability problems including resource depletion, toxic emissions, and unfair labour practices. The impacts of these sustainability problems only multiply with the ever-growing number of garments being produced. However, there is a difference between fashion and clothing consumption, which is often overlooked due to a lack of language but must be recognized to better understand the drivers of consumption. Based on literature from the fields of fashion, sociology, and political economy, this research identifies why mass-consumption of clothing has become such a resilient part of the global economy; it then goes on to explore how to reduce textile waste through innovations such as social innovation. Textile waste is a symptom of consumption, mismanagement of unwanted textiles, and a lack of technology in recycling the material. This dissertation proposes a circular economy approach to reducing textile waste. It does so by leveraging insights from Social-Ecological System (SES) literature to argue that solutions must recognise that the fashion industry is a complex social-ecological system comprised of interactions between interdependent subsystems. Moreover, this paper analyses innovations in the fashion system and uses social innovation theory to study social innovation cases to distinguish transformative approaches to textile waste and sustainable fibre production. While describing the role of the social entrepreneurs and system entrepreneurs in building these innovations, challenges are identified to scaling these innovations out, up, or deep to reflect the innovations' status. To better understand the transitioning process of the industry, the multi-level perspective from transition management is used to recognize the system dynamics. This research uses qualitative and quantitative research methods (i.e., semi-structured interviews, life stories, surveys, and on-site observations). It contributes to the knowledge of how to transition the fashion industry towards sustainability. Additionally, it helps close the research gap on how to tackle textile waste while acknowledging the difference between the terms fashion and clothes, different sustainable fashion concepts, and the various stakeholders' roles in the fashion system.

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Last but not least, I want to thank my husband and our sons, my parents, friends, and colleagues for understanding that a PhD is a time-consuming process. Thank you to Amr Elalfy for going with me on hundreds of walks to clear our minds, and to Jason Lajoie for all the discussions we had over the last few years. Without your ongoing emotional and intellectual support, I would not have been able to accomplish this challenge.

Finally, I would like to express my utmost gratitude to everyone who has helped me reach this point, yet I want to clarify that all omissions and errors are my own. **Thank you!**

DEDICATION

I dedicate this dissertation to my beloved husband and our sons Lukas and Johannes.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CTR	Council for Textile Recycling
DGP	Gross Domestic Product
EPA	Environmental Protection Act
ETI	Ethical Trading Initiative
FTC	Federal Trade Commission
GFA	The Global Fashion Agenda
IC&I	Industrial, Commercial, and Institutional Sector
MICMAC	Impact Matrix Cross-Reference Multiplication Applied to a Classification
MSW	Municipal Solid Waste
PCA	Principal Component Analysis
PEST	Political, Economic, Social-cultural, and Technological Environment
SDGs	Sustainable Development Goals
SES	Social-Ecological Systems
UCI	Used Clothing Industry
WFTO	World Fair Trade Organisation
WTO	World Trade Organisation

CHAPTER 1: Introduction

This chapter presents the research context of the dissertation and the main research fields, introduces a conceptual framework, describes the research gaps, the research questions and objectives, explains the organisation of the dissertation, and concludes by listing its contributions to the field knowledge.

1.1 Research Context

This dissertation contributes to a better understanding of how to transition the fashion industry, in regard to the issues of textile waste and consumption, towards sustainability through social innovation. In this dissertation, I define the fashion industry as a system that includes the design, production, marketing, selling, consumption, disposal, and recycling of garments. In emphasizing a garment's entire life cycle, the areas of consumption, disposal, and recycling must not be overlooked, though they often are in this industry as well as in the literature. This life cycle approach offers three advantages: 1) It helps address the different environmental and social impacts of each product stage; 2) it includes the stakeholders who are involved at each phase; and 3) it highlights the opportunities and challenges for innovations.

Thirty years after the World Commission on Environment and Development's report "Our Common Future" (Brundtland, 1987) came out, the environmental degradation and labour exploitation in the fashion industry continue to compromise the needs of both current and future generations. The fashion industry does so by exploiting its workers, including children and forced labourers, under unfair and unsafe working conditions (Smestad, 2009), and by contributing to ecological damage in the production process through resource depletion of water and land as well as the release of waste and emissions into the environment (Fletcher, 2013a; Lavergne, 2015; Minney, 2016b; Slater, 2003). If it continues on this path without taking action, the fashion industry will count for a quarter of the world's carbon budget by 2050 (Ellen MacArthur Foundation, 2017). This approach suggests that the fashion industry needs to significantly cut

back and reduce human activity to reduce its negative impact to remain within the limits to growth.

The concept of sustainability was further developed at the 1992 Earth Summit in Rio and led to the foundation of the World Business Council for Sustainable Development, which promotes integrating sustainability into business practices and strategies. The goal is a 'triple bottom line' that takes social, environmental, and economic business goals equally into account (Elkington, 1997). In response to these developments, many fashion brands have declared themselves sustainable and eco-conscious; still, the global fashion agenda has not led to the desired output. Despite improvements towards sustainability, the fashion industry is still far from being sustainable, and progress is too slow to counterbalance its rapid growth (Global Fashion Agenda, The Boston Consulting, & Sustainable Apparel Coalition, 2019).[1] The needs of current and future generations remain compromised.

Though the fashion industry is an adaptive system that has changed over time to retain its functionality, it resists sustainable transformation because the concept of sustainability in the fashion industry goes against the idea of fashion itself. Fashion is defined as the continual consumption of new products in response to trends (Fletcher, 2008; Loschek, 2009). Fashion is used to express individuality and group belonging (Loschek, 2009). Moreover, fashion can even be used to pursue happiness (Mair, 2018).

Encouraged by the political climate, globalisation, and current production methods, fashion consumption has accelerated. Data from the World Trade Organisation show that apparel consumption in North America has increased substantially to a level unparalleled in history (Tang, 2014). Such increased consumption has enlarged the industry's environmental burden: Each

1 The Global Fashion Agenda (GFA) is an industry collaboration committed to increasing sustainability in the fashion industry. The organisation determines priorities where companies should take action by offering guidance on where to focus efforts.

garment, irrespective of price, requires resources and causes pollution (Fletcher, 2008). Furthermore, the extensive consumption of textiles has led to vast amounts of unwanted garments. A waste study conducted in Canada found that textiles make up almost 4.5 percent of the residential waste stream, an estimated 480,576 tonnes of textile waste Canada-wide (Drennan, Weber, Jacob-Vaillancourt, Kozlowski, & Fiset-Sauvageau, 2021). Furthermore, only 7.5 percent of the diverted material is recycled due to a lack of a recycling industry (Weber, 2015a). In contrast to many other industries, recycling is not a common practice in the fashion industry wherein garments are used and disposed of after only several wears.

In response to the rising environmental devastation due to the fashion industry, the Ellen MacArthur Foundation (2017) set out a vision for the industry to become circular. Although the industry partially recognises its unsustainable practices and supports this vision, progress remains slow. Pedersen and Andersen (2015) noted that the fashion industry's "current approaches to sustainability are limited and fail to address more fundamental challenges linked to the dominant business models and consumption behaviours" (Pedersen & Andersen, 2015, p. 315). The industry does not accept limitations of the environment and is instead "built on the principle of limitless growth" (Grose, 2013, p. 57), aiming to sell more garments every year. The dominant business models and consumption behaviours contradict the 17 Sustainable Development Goals (SDGs), signed in 2015 by more than 190 world leaders, which included ending poverty, improving global inequity, sustainable production and consumption, and addressing climate change. A fundamental change in the fashion industry is needed to achieve the SDGs. It will require that stakeholders and consumers seek radical innovation and large-scale change.

I propose a regenerative sustainability approach that focuses on improving environmental quality and human wellbeing instead of a net zero impact which targets the reduction of negative impacts. Cole, Robinson, and Westerhoff (2016) claimed that a regenerative sustainability approach has four advantages: Firstly, it focuses on doing more good; this is inspiring as it asks for active engagement while creating a desire for change. Secondly, such

an approach pays attention to the social dimension of sustainability which is often ranked behind the environment. Thirdly, it aims not only to reduce harm, but also to rehabilitate existing damage. Finally, such an approach triggers fewer opponents to the scientific knowledge, which is helpful in the transmission and adaptation of this knowledge by the broader community and society (Cole et al., 2016).

One way to achieve large-scale change in the fashion system is through social innovation, a "complex process of introducing new products, processes or programs that profoundly change basic routines, resource and authority flow, or beliefs of the social system in which the innovation occurs" (Westley & Antadze, 2010, p. 2). Social innovation can address complex problems in the fashion industry by designing systemic transformation. Further, social innovation can help to develop and grow business innovations (Butzin et al., 2014; Zahra, Gedajlovic, Neubaum, & Shulman, 2009) as more companies recognise that their own transition towards sustainability requires their customers to believe they are sustainable (Oeij, Van der Torre, Vaas, & Dhondt, 2018). Given the unsustainable practices in the fashion industry and the lack of solutions, social innovation can bridge this gap. Social innovation addresses the roots of the problems and provides new approaches and creative ways to develop solutions (Antadze & Westley, 2012).

Since the fashion industry is a system comprised of ecological and social aspects, it is necessary to examine its processes from both the environmental and social perspectives—as a social-ecological system (SES). As Redman et al. noted, "[i]t is no longer tenable to study ecological and social systems in isolation from one another" (Redman, Grove, & Kuby, 2004, p. 161). From an environmental lens, ecological and social processes are inseparable (Gunderson & Holling, 2002; Kinzig, 2001; Low, Costanza, Ostrom, Wilson, & Simon, 1999; Redman, 1999). SES research conducts integrated analyses of coupled human and natural systems to "reveal new and complex patterns and processes not evident when studied by social or natural scientists separately" (Liu et al., 2007, p. 1513). Central topics in the study of social-ecological systems include feedback mechanisms, complexity, and resilience (Berkes, Colding, & Folke, 2008).

Research within SES integrates complex systems thinking with a sustained, critical focus on "resilience, adaptability and transformability" (Walker, Holling, Carpenter, & Kinzig, 2004, n. p.).

This dissertation leverages insights from SES research to target drivers of unsustainability in the fashion system. Factors that contribute to environmental problems are post-consumer textile waste and consumption (Gardetti & Torres, 2013), the latter of which Fletcher (2013a) cites as a major issue underlying sustainability in the fashion industry. This dissertation examines the resilience and adaptability in the context of unsustainable practices in the fashion industry to describe the dominant order of the fashion system.

In social innovation, the ecological impact is often neglected, hindering industry transformations towards global sustainability. Therefore, social innovation for sustainability must include human-environmental interactions and feedback mechanisms to identify opportunities to achieve large-scale change (Olsson, Moore, Westley, & McCarthy, 2017). This research aims to reduce the environmental burden of the fashion industry and addresses the human-environmental relationship as the dissertation's core purpose.

The title of this dissertation, *Transitioning the Fashion Industry towards Sustainability,* refers to large-scale societal change that needs to happen in the fashion industry, but which might emerge only over a lengthy period of time. Therefore, the title underlines the industry's transition to sustainability as continuing to be a process of innovation. As Loorbach and van Raak (2005) outlined, transitions require multiple changes at different social levels of niches, regimes, and landscapes that influence each other. To better understand the sustainability transitioning process, this dissertation uses the multi-level and multiphase concept from transition management (Geels, 2002) as a conceptual framework and complement to social innovation theory to describe the change from one societal regime or dynamic equilibrium to another.

1.2 Bodies of Research

This study brings together three different bodies of research: The issue of textile waste, the fashion system, and social innovation in conjunction with defining concepts that are theoretically significant to better understanding systems transformation (see Figure 1).

Textile waste is a symptom of fashion production and consumption. Textile waste significantly impacts the environment. These impacts, the role of the different stakeholders in contributing to this issue as well as the possibilities of improving the situation need to be understood. However, there is no solution to this symptom if the roots of the problem contributing to textile waste are not addressed.

The fashion system is complex; understanding the system and its underlying patterns of consumption and production starts with a differentiation between fashion and clothing to recognize that garment consumption results to a high degree from clothing and not fashion consumption. Furthermore, recognizing the patterns in the industry's structure is essential to identifying the sources of unsustainable practices. Sustainable fashion concepts respond to the industry's negative impacts; however, the concepts differ in their approach and degree to which they are sustainable but provide a guideline to make the fashion industry and its consumers more sustainable.

Once the roots of the problem are understood, and potential solutions are determined, then social innovation can be considered. Whether the innovation is begun by an individual or a group, social innovation is a process through which a complex problem may be solved, while one of the challenges is to scale the innovation and achieve a sustainable transformation. To explain cross-scale dynamics and systems transformation, I use the multi-level perspective on transitions to complement social innovation theory.

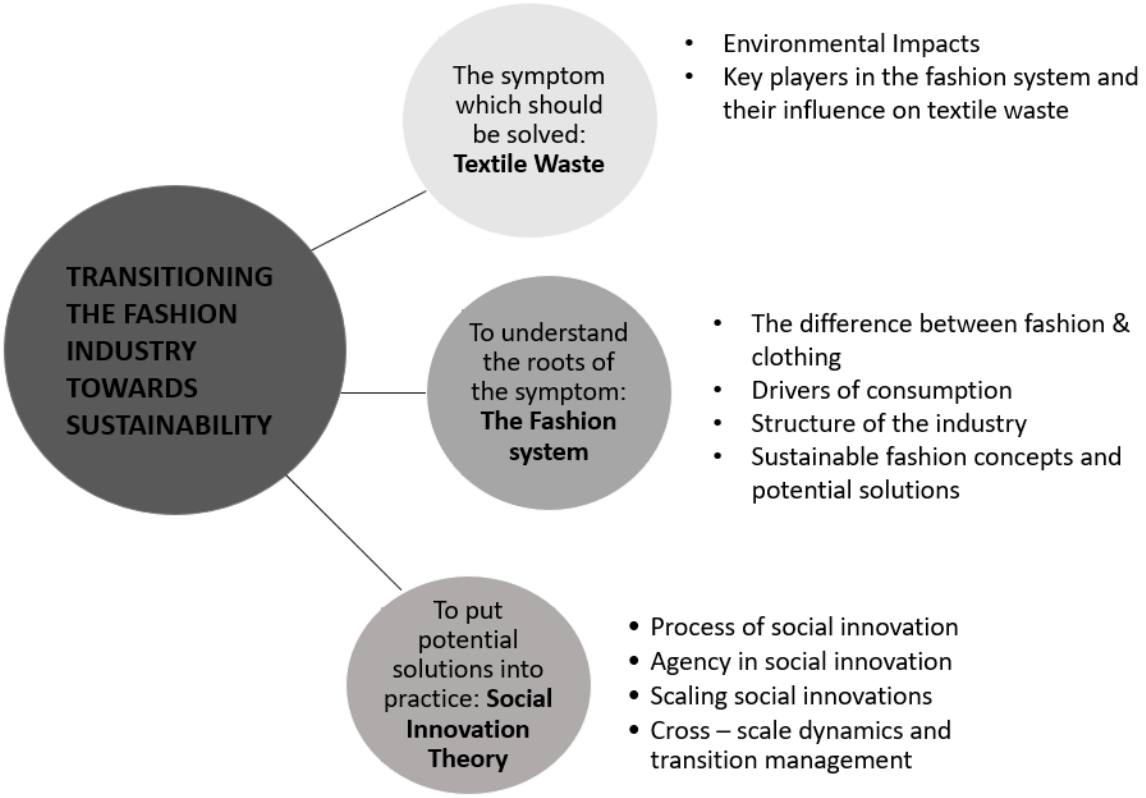

Figure 1: Bodies of research

1.3 Conceptual Framework of the Dissertation

The fashion industry is a complex system that operates on multiple levels with global supply chains and consumers. It is a system with significant environmental impacts in various problem domains. Although each problem domain has its unique characteristics and environmental impacts, the substantial volume of garment production multiplies all of them. Therefore, one innovation alone will not be able to transition this industry; instead, multiple innovations must initiate a process of change that might require decades to complete. I use the multiphase concept (Geels, 2002) from transition management theory and apply it to the fashion system to illustrate the nonlinear change and the different possible pathways (see Figure 2).

The framework describes a system on three levels: landscape, regimes, and niches. The landscape consists of external factors that do not change, only change slowly, underly long-term

change, or change after rapid external shocks (Geels & Schot, 2010). These factors influence the regime and the niches. The regime consists of institutions and infrastructures that determine the routines and rules shared in a system. Loorbach, Frantzeskaki, and Avelino (2017) described regimes as the dominant technologies, institutions, routines, or cultures. Regimes provide stability and interact with the landscape and the niches (Geels & Schot, 2010). Niches, in contrast, are characterized through novelty and innovations and can bring change to the regime if there is a window of opportunity. However, this change can only happen if the landscape has released the pressure on a regime to open up and allow the niche developments to enter. If regimes are stable, there is no opportunity for niches to change regimes. Although niches are the seeds of transitions, they can not change the landscape; and if they change the regime, the change is nonlinear and disruptive (Geels & Schot, 2010).

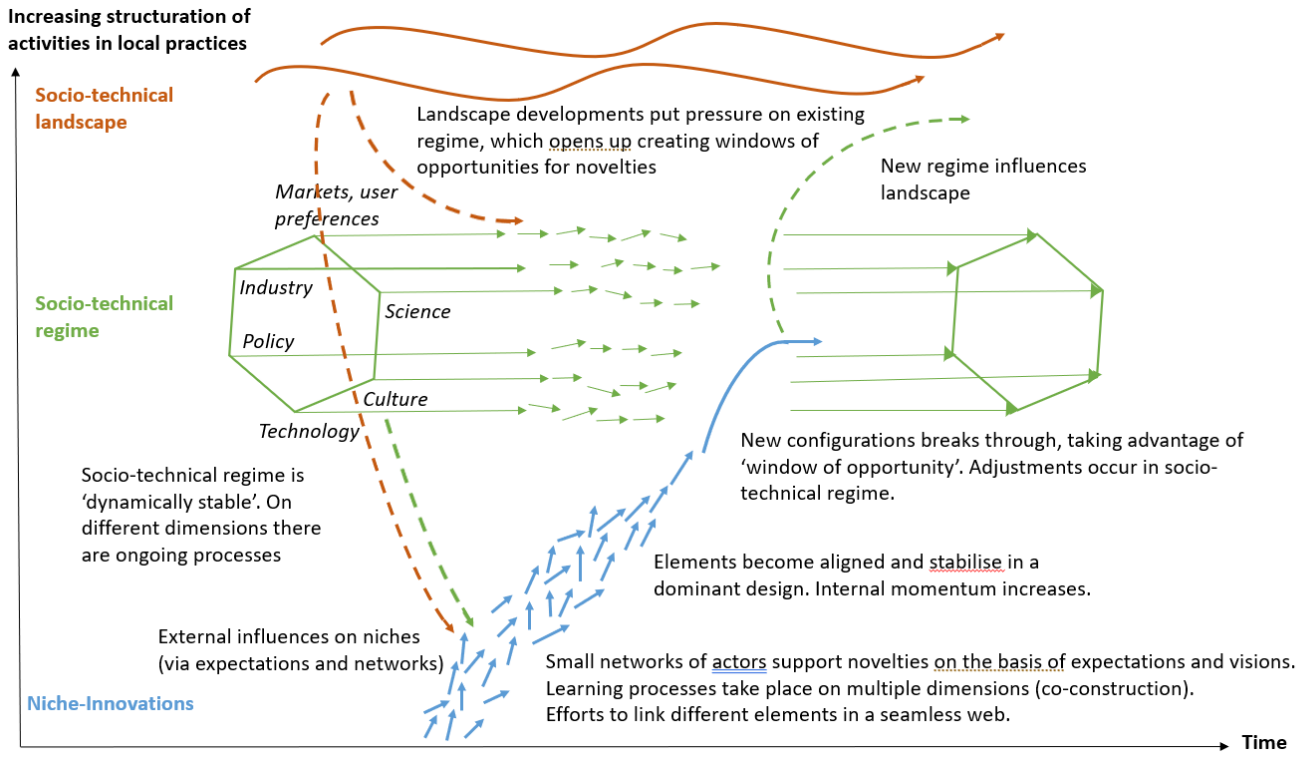

Figure 2: Multi-level perspective on transitions (Geels, 2002, p. 1263)

Applying this multi-level perspective on transitions, we can map out the fashion system according to landscape, regime, and niche levels (see Figure 3).

Chapters 3 and 4 focus on the landscape by defining how people consume, produce, and market fashion, including the drivers of fashion consumption and the political climate that fosters consumption. Critical factors determining the landscape are low prices (see Section 3.3), low utilization (see Section 3.4), and high consumption of garments. As already described above, these factors are difficult to change but form the external environment of the fashion system that influences how the regime and niches operate.

The regime of the fashion industry consists of the mainstream fashion industry. Based on the industry's structure, companies mediate between customers, suppliers, and policy approaches to determine minimum wages and quality standards. As seen in Chapter 4, part of the regime is also the industry's negative environmental impacts (see Section 4.2) and the problem domain of textile waste (see Chapter 5).

To deal with the industry's negative impacts, the landscape is funding and encouraging research on sustainable alternatives and trying to influence and encourage niche developments while putting pressure on the regime to make the fashion industry more sustainable. Based on the pressure from the landscape, the fashion regime also encourages sustainable niche innovations to help find solutions for their problems.

This study introduces social innovation as a process whereby individuals or groups experience pressure to innovate and take action to change the system and profoundly develop solutions for complex problems (see Chapter 7). I present different examples of sustainable innovations: Eileen Fisher (see Chapter 6); Safia Minney (see Chapter 7); and Evrnu, Canopy, and the Ontario Textile Diversion Collaborative (see Chapter 8). I evaluate whether the innovations meet the criteria for social innovations, and I describe how they aim to change the system fundamentally. Since niches can develop novel ideas and develop potential solutions for various

issues, niches can partly influence the regime. This influence leads to different sustainable fashion developments in the fashion regime, which I summarise and describe as sustainable fashion concepts (see Section 4.3). The fashion regime also developed a vision for a circular economy to reduce the environmental footprint; therefore, I outline how to foster textile recycling to achieve a circular fashion system (see Chapter 5) while describing the regime and its stakeholders (see Chapter 4 and 6).

A requirement, but also a challenge for social innovation cases, is to scale their innovations. The cases explored in this dissertation are no different. None of the cases concerned with textile recycling and sustainable fibre production could scale deeply and change consumer culture and consumer behaviour. According to the multi-level perspective, niches cannot influence the landscape; they can only influence the regime if there is a window of opportunity, whereby niche developments can break through and create a new regime configuration. The new regime can then influence the landscape (Geels & Schot, 2010). However, if niches have to become part of the new regime to change the landscape, they are no longer niches. Therefore, it is questionable whether niches can scale deeply.

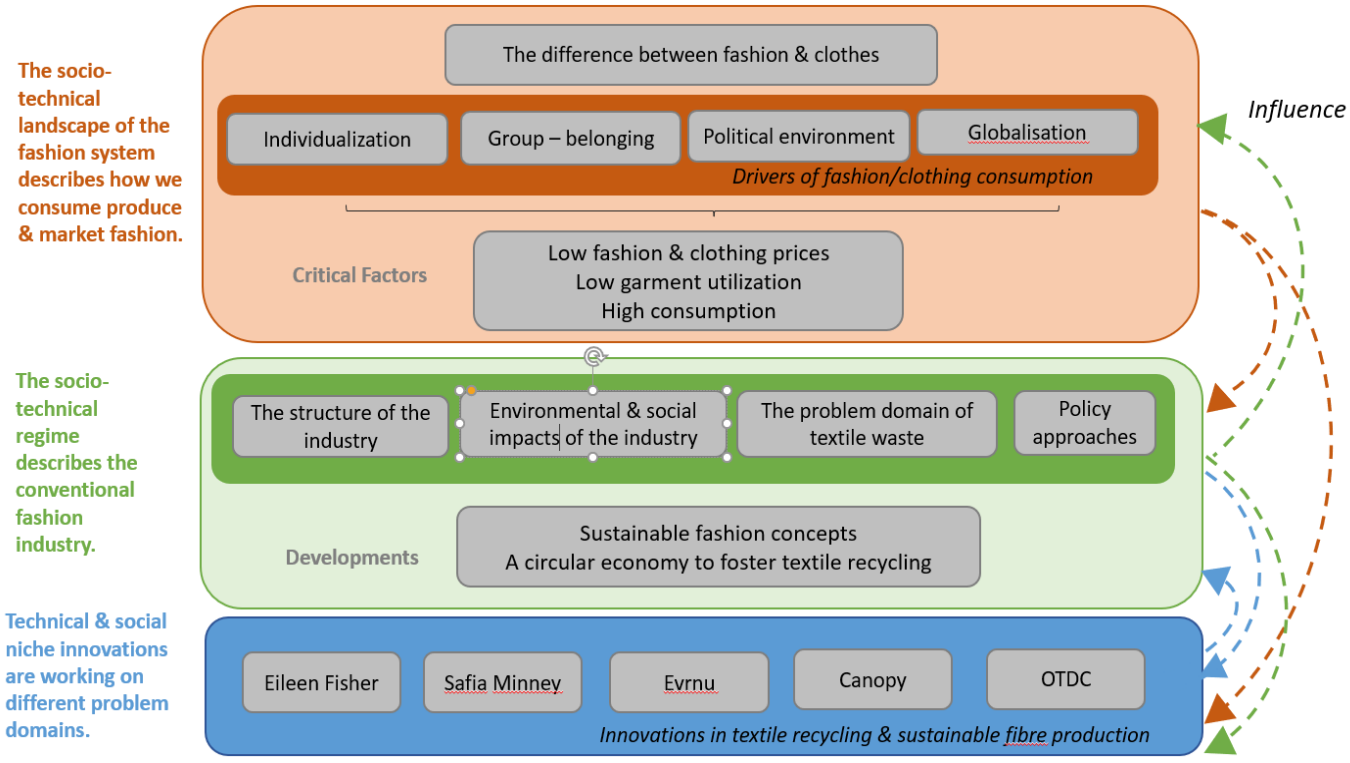

Figure 3: Conceptual framework of the dissertation

1.4 Research Gaps

The following research gaps have been identified (see Figure 4):

1. **There is a lack of clarity as to why people are consuming so many clothes:** The fashion industry is widely blamed for its negative social and environmental impacts, which is further accelerated through consumption. Still, there is a research gap that outlines why people consume so many clothes and why fashion's mass consumption has become such a resilient part of the global economy.
2. **There is a need for a validated questionnaire to assess a person's fashion interest:** Although the drivers of *fashion* and *clothing* consumption are different, the terms have been used interchangeably in the literature. To address overconsumption, researchers must develop strategies to satisfy customers' diverse wants and needs based on a

person's fashion interest, which requires differentiating between fashion and clothes. Various researchers developed and used questionnaires to determine a person's fashion interest (Weber, 2015b), fashion involvement (O'Cass, 2004), trend sensitivity (Lang, Armstrong, & Brannon, 2013), or fashion orientation (Gam, 2011), but scholars did not focus on the validation of their questionnaires. There is a research gap because a validated questionnaire to assess a person's fashion interest does not exist**.** The first manuscript addresses this research gap and presents a validated fashion interest scale.

3. **There is no framework that includes all sustainable fashion concepts:** Despite little industry progress towards sustainability, sustainable fashion has become a buzzword, and today every company claims it is sustainable to some degree. However, the range of efforts is not discussed in sustainable fashion literature. While the concepts of slow fashion (Fletcher, 2010; Hall, 2018; Minney, 2016b; Nakano, 2009) and eco-fashion (K. Black, 2015; Pookulangara & Shephard, 2013) are established, this dissertation includes fashion with a conscience. This dissertation delineates between the sustainable fashion concepts, comparing and evaluating their sustainability commitment.
4. **There is a lack of clarity on how to foster textile recycling in the most effective way:** A direct result of this overconsumption of clothing is textile waste. While reduced consumption would be the easiest way to solve this issue, this approach has limited support from the industry, the political environment, and consumers. Hence, the focus of the industry and the political environment is on recycling. Although there is an agreement among stakeholders that a textile recycling industry is needed, the factors that influence textile recycling and the relationships between these factors are not understood (Ellen MacArthur Foundation, 2017). There is a research gap that determines how textile recycling can be encouraged in the most effective way to get textiles out of landfills. Hence, the second manuscript identifies the system's most influential factors to create strategies that encourage textile recycling.
5. **There is a lack of knowledge and understanding of how brand owners are innovating to make fashion circular:** Brand owners are a powerful stakeholder group. They develop new products and relate to consumers and manufacturers. Hence, they play a central role

in tackling textile waste and making fashion circular. However, there is a lack of knowledge and understanding of how they should address textile waste and put circularity into practice while transforming their business models. Manuscript three shows how a luxury fashion company (Eileen Fisher) innovates to contribute to a circular economy.

6. **There is a research gap for an assessment tool to determine social innovation cases:** Social innovation can help transform complex systems by addressing the roots of the problem and introducing new products and processes (Antadze & Westley, 2012). Considering the industry's unsustainable practices, it is unclear whether social innovation exists in the fashion system. There is a gap for an assessment tool that defines the requirements to identify cases of social innovation. This dissertation develops an assessment tool and applies it to a promising social innovation case in the fashion industry.
7. **There is a need to understand how social innovation can transition the fashion industry towards sustainability:** This dissertation introduces promising cases of social innovations that address textile waste and sustainable fibre production. Comparing these cases and identifying the roles of the social and system entrepreneurs in building these innovations will clarify the challenges of scaling these innovations (out, up, deep) while assessing their capacities to shift the system towards sustainability.

1.5 Research Questions and Objectives

The first objective is to understand why fashion's mass-consumption has become such a resilient part of the global economy (Chapters 2 and 3). The research questions are:

- How can we measure whether consumers are interested in fashion or clothes (Chapter 2)?
- What are the drivers for clothing over-consumption (Chapter 3)?

The second research objective is to provide an overview of all sustainable fashion concepts to compare and evaluate their sustainability commitments (Chapter 4). The research question is:

- Which sustainable fashion concepts exist, and how do they address sustainability (Chapter 4)?

Thirdly, this dissertation explores the subject of getting textiles out of landfills and making fashion circular (Chapters 5 and 6). This objective is addressed through the following research questions:

- What factors influence textile recycling in the fashion system directly and indirectly, and how can textile recycling be encouraged? (Chapter 5)
- How are brand owners in the fashion industry innovating to reduce the amount of textiles going into landfills? (Chapter 6)

The final research objective is to understand how social innovation can lead to transformative change in the fashion system (Chapters 7 and 8). The following research questions are defined:

- What tool can be used to access a social innovation case to determine whether social innovation exists in the fashion industry? (Chapter 7)
- Which promising cases of social innovations exist around textile recycling and sustainable fibre production? What has been the role of the social entrepreneurs and system entrepreneurs in building these innovations? (Chapter 8)

1.6 Organisation of the Thesis

This dissertation is broken down into eight chapters plus an introduction chapter (see Figure 4).

How Fashionable are We? Validating the Fashion Interest Scale

Chapter 2 provides a literature review on the difference between fashion and clothes and presents drivers for fashion consumption (the need for individualisation and group belonging). The chapter considers how these drivers affect purchasing motivations, how these motivations differ between fashion and clothes, and how these differences influence possible strategies to reducing consumption. This chapter answers the research question of determining a person's fashion interest by presenting a validated scale. The research shows that most of the study participants were not interested in fashion.

Drivers of Clothing Consumption

Chapter 3 continues by analysing how the political economy has encouraged shopping and how low price, garment utilisation, and the disconnect between the producer and consumer have functioned as accelerators. This chapter answers the research question of why fashion's mass-consumption has become such a resilient part of the global economy.

The Fashion System and Sustainable Fashion Concepts

Chapter 4 reviews the fashion industry structure to provide an overview framework summarising the industry's negative social and environmental issues. This framework offers a novel view to connect clothing consumption drivers with the fashion industry's different problem domains. To answer whether fashion can ever be sustainable, it presents a literature review of different sustainable fashion concepts. Further, it outlines some policy approaches to respond to the negative impact of the fashion industry. It concludes that sustainable fashion is possible if fashion's mass-consumption can be stopped.

A Structural Impact Analysis of the Fashion System with Regard to Textile Recycling

Chapter 5 addresses the symptom of textile waste with an aim to answer the question: How can textile recycling be encouraged to make fashion circular and get textiles out of landfill? First, a detailed description of the system is provided before factors that directly and indirectly influence textile recycling are analysed. While the political environment and markets are the system's key factors, brand owners should develop sustainable products.

A Circular Economy Approach in the Luxury Fashion Industry: A Case Study of Eileen Fisher

Chapter 6 further examines the possibilities for brand owners to make fashion circular with a case study about the luxury fashion company, Eileen Fisher. This chapter describes how the brand is innovating to reduce its environmental footprint while growing its business. However, getting textiles out of landfills requires more than one company changing its business practices; it demands large systems transformation. Therefore, this and the following chapters are related to social innovation that targets transformative systems change.

Social Innovation in Fashion

Chapter 7 provides a literature review of social innovation literature to determine and summarise what criteria must be met for successful social innovation. Next, Safia Minney's case is presented to answer the research question of whether social innovation exists in the fashion system and, if so, how such an innovation would transition the current fashion system towards sustainability. Encouraged by this case, the next chapter will look for other social innovations in fashion related to textile waste and sustainable fibre production.

Social Innovation in Textile Recycling and Sustainable Fibre Production

Chapter 8 identifies and compares three promising social innovation cases involved in textile recycling and sustainable fibre production. The cases briefly describe the social entrepreneurs'

and system entrepreneurs' roles in building these innovations while outlining the challenges of turning these cases into social innovation.

Conclusion

Chapter 9 describes this dissertation's contributions to the fashion literature and social innovation theories while leading to an increased understanding of industry practices and how to transition the industry towards sustainability. Finally, it presents limitations and discusses future directions for research.

1.6.1 Roadmap of the Dissertation

Figure 4 shows the dissertation roadmap; it provides an overview of the main research questions and the three research fields (fashion, textile waste, and social innovation). In addition, it shows the purpose of each chapter with its sub-research questions and the research gaps addressed. Finally, an overview of the research methods is provided in Appendix E.

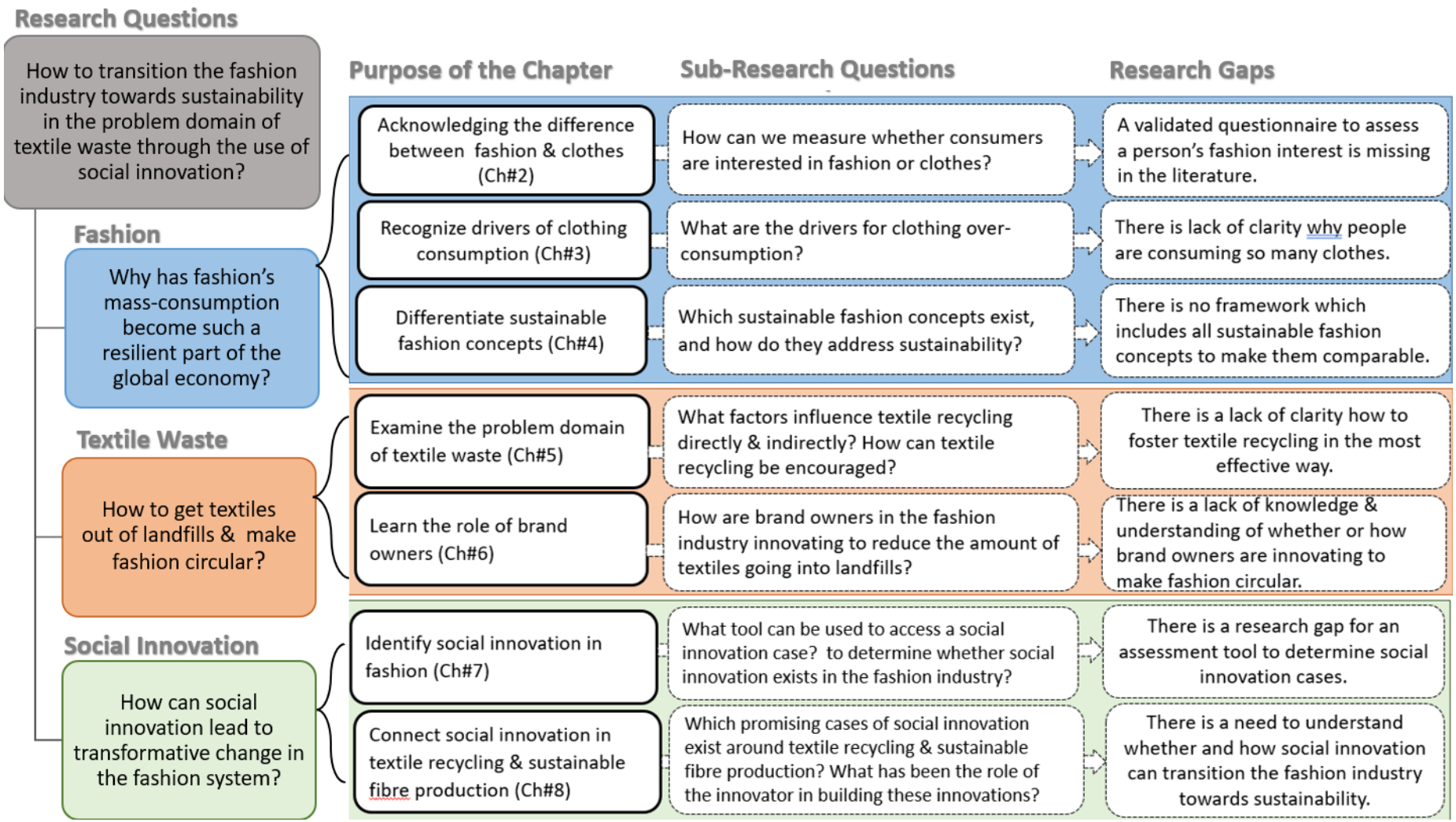

Figure 4: Roadmap of the dissertation

1.7 Contribution to the Knowledge

Throughout this dissertation, seven contributions have been identified, two through published manuscripts and one through a manuscript in the review process.

The first manuscript, presented in Chapter 2, validates a fashion interest scale designed to determine a person's fashion interest. A validated tool is presented that can measure whether consumers are interested in fashion or clothes. This scale reflects the entire spectrum of fashion interest as a continuum from highly interested to disinterested. The fashion scale can be used to connect fashion interest with other attitudes and behaviours to better understand drivers of clothing consumption and to determine new strategies to address consumption.

People use fashion to express their identity and show their group belonging; both motivations are strong drivers to the careful selection of garments. However, the manuscript shows that only a small portion of people are interested in fashion. Over the past century, the political economy has stimulated mass clothing consumption to make customers happy and avoid political upheaval. While fashion is used as a synonym for clothes, the difference has diminished, and today the term fast fashion describes the overconsumption of clothes. Fashion production has become a business strategy to maximise profit as quickly as possible. Fashion is no longer about the individual style of dress; its consumption is driven by business interest.

Today, most fashion companies are somehow sustainable; however, this is not reflected in the literature, which only differentiates between Slow and Eco-fashion. This dissertation adds to the sustainable fashion literature by acknowledging mainstream fashion industry's transition towards sustainability. By introducing the concept of fashion with a conscience, a company's sustainability commitment can be compared and evaluated.

The second manuscript, Chapter 5, conducts a structural impact analysis to reduce the system's complexity and identify the system's key factors influencing textile recycling. Results

indicate that the political environment and markets are critical factors of the system; and strategies are presented that governments should focus on to encourage textile recycling. This research emphasises governments' role as enablers for change in getting textiles out of landfills by creating markets for products made from recycled fibres.

The third manuscript, Chapter 6, contributes to the literature by showing how Eileen Fisher, one of the most innovative fashion brands, innovates by reducing the number of textiles going into landfills. The Eileen Fisher case closes a research gap because it demonstrates that brand owners in the fashion industry can make fashion circular and gain revenue if there is a willingness to change business practices.

This research contributes to the social innovation literature by providing an assessment tool to identify a social innovation case. Further, it connects social innovation with the fashion industry and demonstrates that social innovation exists in the fashion system. Connecting the fashion system with research on social innovation is still a new application of social innovation.

Further, this research presents three promising social innovation cases that are working on textile recycling and sustainable fibre production. This dissertation shows that social innovation can have transformative impacts, but that the challenge lies in scaling these innovations. This research introduces the term patchwork niches and argues that niches need each other to scale their innovations. Despite efforts to do so, none of the cases could scale its innovation deeply, and this could confirm the multi-level perspective on transitions that niches cannot influence the landscape. However, more research is necessary to see how the introduced cases develop over time.

CHAPTER 2: How Fashionable are We? Validating the Fashion Interest Scale

MANUSCRIPT BEGINS: Weber, S., & Weber, O. (submitted). *Fashion and Textiles (FTEX)*.

2.1 Introduction

The global fashion industry accounts for up to two percent of the world's Gross Domestic Product (GDP) and four percent of the global consumer expenditures (Fashion United, 2020). Likewise, over the past decade, the fashion industry has grown at 5.5 percent annually, making it a strong economic factor (Imran, Achim, Leonie, & Hedrich Saskia, 2017). Aside from fashion's strong economic value, it also fulfils significant social and personal functions and meaning in people's lives.

Because of the fashion industry's growth, there is a global call to increase its sustainability and tackle the 'overconsumption' problem of fashion (Wahnbaeck & Roloff, 2017). The first step in addressing this issue is to determine whether overconsumption results from consumer interest in purchasing fashion or clothes. Gwozdz, Steensen Nielsen, and Müller (2017) confirmed that changing consumers' fashion purchasing behaviour requires understanding their consumption patterns. However, the authors did not address the difference between fashion and clothes and overlooked the different functions they fulfil and how these functions determine how consumers choose products.

This conflation in terms can be seen in academia regarding fashion consumption in a broader sense, where the term fashion is often erroneously used to describe all forms of clothing and accessories without any connection to their fashionable status (Loschek, 2009). As a result, the different functions of fashion and clothes and purchase motivations blend together.

Differentiating between the terms clothing and fashion is critical in adequately addressing the reasons why people purchase garments. This research aims to address this lack of differentiation to show that fashion consumption is based on fashion and clothing consumption. We argue that the distinction between clothing and fashion is important to maintain, and that many global consumer markets consist of many customers not interested in fashion but in clothes.

Fletcher distinguished between fashion and clothes by noting that "clothing is material production, [while] fashion is symbolic production" (Fletcher, 2008, p. 119). The term fashion typically describes the prevailing style of dress (Craik, 2009). A fashion trend starts through mimicry or the refusal for a particular style or set of product characteristics within a consumer group (Keiser & Garner, 2012). By adopting a specific clothing style, people express that they identify themselves with the attitude and behaviour of a particular group that they want to be part of. Changes in attitudes and behaviours become changes in fashion style; therefore, changes in styles are a key attribute of fashion (Wilson, 2003). Clothes also change over time due to the seasons, new production technologies, or a continuing routine of replacement; however, they are not socially negotiated in the way that fashion is with their primary function being protection from the elements (Loschek, 2009).

Ajzen (1991) described how thinking and feeling about something are expressed in a person's attitude and behaviour. A person with high fashion interest will most likely look for fashionable garments, while a person with low fashion interest will not. The purpose of this research is to draw attention to the difference between clothes and fashion and to determine how to evaluate whether a person is motivated to purchase a garment by an interest in fashion or in clothes. This differentiation will help to better understand the drivers of clothing consumption which can be used to develop strategies to address consumption habits, including overconsumption.

Reducing fashion consumption requires knowledge about how a customer satisfies a desire for constantly changing fashion styles. Addressing customers, depending on their interest in fashion, offers the possibility of reducing consumption through new business models such as

garment rental and leasing or clothing libraries. However, before such strategies can be developed and proved, it is necessary to have a tool to determine fashion interest. While Gwozdz et al. (2017) confirmed that all consumer segments do not support new business models, it remains unclear to which degree such services are dependent on customers' fashion interest.

A validated fashion scale, that assesses the fashion interest of a person or a market, is needed. For instance, the Ellen MacArthur Foundation (2017) claimed that to increase sustainability in the fashion industry, more research, that segments a market according to its fashion attitude and behaviour, is required. This paper develops such a validated fashion scale. The scale is useful as a tool to measure the fashion interest of a person or a market. Such a market segmentation can be combined with other segmentation criteria to provide insights into consumer purchasing motivations.

Research has used different psychographic attributes of fashion to segment customers according to their fashion attitude and behaviour. Questionnaires have been developed to assess a person's fashion interest (Weber, 2015b), fashion involvement (O'Cass, 2004), trend sensitivity (Lang et al., 2013), and fashion orientation (Gam, 2011). While numerous studies have developed questionnaires, none have focused on the validation of their questionnaires. Consequently, it remains unclear whether these questionnaires are suited to determine fashion interest, fashion involvement, trend sensitivity, and fashion orientation. The presented study addresses this research gap.

To add to the knowledge about measuring fashion interest, the objective of this study is to analyse the validity of the fashion scale developed by Weber (2015b) that evaluates fashion interest and demonstrates how the scale could be used to segment a market. The research questions are whether the fashion interest scale of a representative sample of the Province of Ontario is normally distributed and whether the fashion interest scale can discriminate between people with high and low fashion interest.

Based on the method of differentiation between known groups (Boateng, Neilands, Frongillo, Melgar-Quiñonez, & Young, 2018), this study validates the fashion scale that measures a person's fashion interest and shopping frequency developed by Weber (2015b) and compare Weber's sample from the Province of Ontario (Canada) with a group of fashion students from Toronto (Ontario).

The results indicate that the questionnaire developed by Weber (2015b) is suited to determining a person's fashion interest. All survey questions of the fashion scale show a high homogeneity and are valid for both groups. Therefore, the fashion scale is suited to assessing fashion interest.

We conclude that the fashion scale is a valid instrument to segment markets according to fashion interest. The segmentation is helpful for many applications in research and practices, such as consumption analyses and product development.

The remainder of the paper is structured as follows: First, we present a literature review on the difference between fashion and clothes to better understand what fashion is. Next, we describe the meaning of fashion interest and how it is used as a segmentation criterion for markets. After presenting the research objective, we describe the methods and the results of the study. We conclude with a discussion of the results and implications of this research.

2.2 Literature Review

The term fashion is used to describe the prevailing style of dress (Craik, 2009), or as Kaiser put it, "Fashion change is intricately linked to changing ideas about aesthetic rules" (Kaiser, 1997, p. 231). Wilson (2003) further described fashion as a permanent changing phantasmagoria of styles. Therefore, fashion starts with introducing a new style or a variation of an existing style (Workman & Caldwell, 2007). Changes in detail can differ from one community to another and over time; therefore, fashion is change (Craik, 2009; Wilson, 2003). Wilson further claimed that "no clothes

are outside fashion … even uniforms have been designed [underlying fashion trends]" (Wilson, 2003, p. 3). Loschek (2009), in contrast, distinguished fashion from clothes by defining fashion as social validity and communication within society. Loschek claimed that "change [in clothing] is generated by the economic concept of seasonal renewal in clothing, without this renewal necessarily being accepted by the consumers or a fundamentally new image of fashion being created" (Loschek, 2009, p. 134). Even seasonal changes in clothing do not represent changes in fashion since they are part of a continuing routine of replacing clothes. The author von Busch likened fashion to language: "We cannot have our own personal language; it has somehow to be shared to work as communication" (von Busch, 2012, p. 16). Hence, fashion is created and disseminated by groups or society at large by negotiating the limits of tolerance, refusal, and acceptance of styles. Clothes, by contrast, are not socially negotiated but can nonetheless become fashion through mimicry of style by a group in society (Loschek, 2009). The social validity makes it possible for fashion to occur when a designer presents their creations on a catwalk, but it can also occur when a teenager modifies jeans or shirts and peers copy the modified style (Loschek, 2009). Fashion is not a top-down hierarchy of communication from the designer or industry to the public via the catwalk or weekly changing clothing styles in a store.

Fashion serves a cultural function, adding to the "traditions, and habits that are particular to a social group … at a particular stage or state of civilisation" (Craik, 2009, p. 3). There can be multiple groups with different cultures and even subcultures, each of them describing "a distinctive network of behaviour, beliefs, and attitudes" (Craik, 2009, p. 3). Similarly, Frings stated that fashion reflects the social, political, economic, and artistic forces during a specific time (Frings, 2008, p. 4). Keiser and Garner saw fashion as "a mirror of the prevailing ideas in our society" (Keiser & Garner, 2012, p. 580) and, more broadly, a 'consensus' of how we define and continually redefine ourselves (Craik, 2009, p. 2-3). People seek fashion that caters to various subcultures and still offers opportunities for individual expression. Fashion, therefore, requires different styles of garments to satisfy different people's needs.

While people use fashion to define their identity and to distinguish themselves from others, each person also wants to be part of a group. González and Bovone (2012) referred to this group identification as "respond[ing] to a psychological need for group linkage and personal self-assertion" (González & Bovone, 2012, p. 99). Driven by the need to belong, individuals match their fashion with that of the group to show belonging. This means that if a group requires a specific style of dress, people will buy it. Therefore specific groups like students at a particular age, or soccer fans watching a game, will most likely wear similar garments. "The paradox of fashion is that in trying to look distinctive, we model ourselves on others and give the impression of uniformity" (Craik, 2009, p. 3). To maintain what Loschek referred to as "a uniform image" (Loschek, 2009), people belonging to a specific group share their interest in fashion and shopping behaviour and buy garments to match with their group. Hence fashion interest can be used to segment a market according to people's attitudes and behaviours toward fashion.

Fashion interest describes how familiar a person is with fashion and how much the person knows about fashion. Fashion knowledge is inculcated in a consumer through "product experiences, ad exposure, interactions with salespeople, friends or the media, previous decision-making or previous consumption and usage experiences held in memory" (O'Cass, 2004, p. 875). Unsurprisingly, many of these sources are related to fashion consumption in the sense that the more fashion a customer consumes, the more knowledge the consumer gains about fashion. People can express their fashion interest by showing their trend sensitivity and whether they want to take on a fashion leadership role and become a trendsetter. Fashion trend sensitivity and fashion leadership influence a person's shopping behaviour.

A person's fashion trend sensitivity reflects how fast the person adopts a new trend. The theory of trend adaptation goes back to Rogers diffusion of the innovations model, a model which has been used in over 5000 studies (Rogers, 2004). This theory of trend adaptation reflects an adaptation pattern of a normal distribution and is generally accepted among researchers as a theory to explain how different consumer segments adopt trends over a given timeframe

(Hirschman & Adcock, 1978). The theory models how each market segment influences the attitudes of the next segment (Rogers, 1983).

According to Rogers (1983), people can be innovators (also called trendsetters), fashion change agents (if they adopt trends early), or followers (if they require more time to recognise a trend before they adopt it). Fashion innovators, those with high fashion interest and the highest fashion trend sensitivity, are not only the first to adopt new fashion and trends, but are also opinion leaders (Workman & Caldwell, 2007; Workman & Kidd, 2000). They are "influential" (Summers, 1970, p. 178) because they are "the first to broadcast the latest fashion styles, which influence others to buy new fashion items" (Lang et al. (2013, p. 707). While fashion leaders must cope with the risk that a particular style might not become fashion and end up as a fad, many celebrities strive to be recognised as fashion leaders/influencers. Likewise, people surround themselves with glamourous images and products to cultivate extraordinary taste, identify as privileged, and to share in their fantastical lifestyle (Lasch, 1980). However, once a fashion trend is adopted by fashion followers, fashion innovators will no longer wear the style; this behaviour creates a bell curve adaptation pattern.

People with high fashion interest want to wear the latest fashion. The higher a person's fashion interest, the more fashionable the person, and the more they use fashion to show their uniqueness (Workman & Caldwell, 2007). Being a fashion leader requires enough affluent purchasing power to be able to change styles frequently and to purchase trends early. They shop more frequently to look for new trends; or, as Tigert, Ring, and King (1976) put it, the "highly fashion involved consumer is also the heavy clothing fashion buyer" (Tigert, Ring, & King, 1976, p. 46). They buy new garments often, even if they do not need them, just to keep their wardrobe up to date (Wahnbaeck & Roloff, 2017). Likewise, they spend a reasonable amount of time following the fashion news to be informed about what is in and out of fashion. This knowledge provides a customer with the confidence to make fast purchasing decisions. Furthermore, customers with high fashion interest buy fashion just when the trend comes out, and they are often impulsive. They buy more clothes than their friends and community and shop more

frequently. Workman and Kidd (2000) indicated that fashion innovators are in high need of uniqueness. Law, Zhang, and Leung (2004) claimed that there is a linear relationship between fashion trend sensitivity and fashion consumption; namely, the more often fashion trends change, the more these customers shop. While fashion-oriented consumers often shop on impulse (Workman & Kidd, 2000), impulse buying often leads to overspending (Robert & John, 1982). Fashion interested innovators spend a relatively high proportion of their income on fashion (Strategic Business Insights, 2013). Fashion innovators shop at retailers who lead fashion; therefore, they prefer fashion speciality stores over traditional retailers or department stores (Guthrie & Regni, 2006). In contrast, customers not interested in fashion often purchase clothing in the decline stages when products are deeply discounted and when fashion customers are no longer wearing these items (Guthrie & Regni, 2006). People differ significantly in how fashionable they are; hence, fashion interest can be used as a segmentation criterion to differentiate a market.

Markets can be divided into different market segments or groups that share a similar interest (Rath, Petrizzi, & Gill, 2012). Cahill (2006) further outlined how consumers are divided into different groups to deliver them the "right products". Fashion interest is a psychographic attribute that refers to the attitude and behavioural criteria based on similar interest, values, emotions, or perceptions of fashion. Fashion interest describes a person's relationship with fashion and is a legitimate way to segment a market if the proper questions can be identified to determine a person's fashion interest.

Fashion interest can be used as a metric for segmenting consumers to combine this attitude (i.e., fashion interest) with other attitudes and behaviours. Weber, Lynes, and Young (2017), for example, connected fashion interest and fashion shopping behaviour as a driver for clothing disposal; and Bhatia examined the impact of fashion interest, materialism, and internet addiction on compulsive buying behaviour of apparel (Bhatia, 2019). Other studies have identified fashion interest as part of other market segmentation criteria. For example, Gam (2011, p. 180) described fashion orientation as "an individual's attitude toward, interest in, and opinions about fashion

products". Gutman and Mills (1982) described fashion orientation as a factor composed of four dimensions: fashion leadership, fashion interest, the importance of being well dressed, and the disinterest in fashion or being a fashion leader—what they describe as having an anti-fashion attitude. Park and Burns (2005) further explored the relationship of fashion orientation and found that fashion interest significantly influenced compulsive buying and credit card use. Matthews and Rothenberg (2017), in contrast, claimed that a strong interest in fashion and consistency in following trends lead to fashion-consciousness and eventually to fashion innovativeness.

In the literature, the term "fashion interest" comes close to fashion involvement but is commonly used as its own means to segment markets (Bhatia, 2019; Dhurup, 2014; Kim, 2005; Weber et al., 2017) or as part of fashion orientation (Gam, 2011; Gutman & Mills, 1982; Matthews & Rothenberg, 2017; H. J. Park & Burns, 2005). Fashion involvement describes the participation of an individual consumer. Since involvement often starts with interest, questions to determine fashion involvement often overlap. E. J. Park, Kim, and Forney (2006) analysed the relationships among fashion involvement, positive emotion, hedonic consumption tendency, and fashion-oriented impulse buying in the context of shopping. While Tigert et al. (1976) developed an index of fashion involvement, other researchers related fashion involvement with criteria like the relationship between self-monitoring, materialism, buying behaviour, and consumer characteristics (Browne & Kaldenberg, 1997), as well as personal characteristics such as gender and age (O'Cass, 2004). A comprehensive questionnaire to determine fashion interest was developed by Weber (2015b). Respondents answered questions on a 5-point Likert scale, including questions about fashion trend sensitivity, opinion leadership, and shopping behaviour (Weber, 2015b, p. 81). All questions were equally important and were assigned the same weight. The questionnaire from Weber (2015b) was based on research from Lang et al. (2013) who had explored drivers of clothing disposal in the US based on personal attributes and behaviour; on Tigert, Ring, and King (1976), who studied fashion involvement and buying behaviour; and on Morgan and Birtwistle (2009), who used Rogers' diffusion of innovations model to connect fashion involvement and consumer innovation (2009). Although there is extensive research into

fashion interest as a segmentation criterion (Lang et al., 2013; Morgan & Birtwistle, 2009; Tigert et al., 1976; Weber, 2015b), there is no validated scale.

There is, therefore, a need for a validated questionnaire to determine a person's fashion interest. While most scholars used similar questions for their, none of these studies have validated their scale with a control group and focused on the validation of the questionnaire itself. The advantage of a validated questionnaire is to help collect better quality data with high comparability. Hence, a validated scale reduces the effort but increases the credibility of data.

The objective of this research is to validate the fashion interest scale developed by Weber (2015b) to find out if this questionnaire is suited to identify a person's fashion interest and to segment markets. Since the questionnaire from Weber is based on the questionnaire from Lang et al. (2013), Tigert et al. (1976), and Morgan and Birtwistle (2009), it can be assumed that the theoretical background of the survey is well-founded in the literature and that the questionnaire has high content validity. Therefore, this research will focus on the construct validity.

2.3 Methods

Scale validation is the third step in scale development, which includes testing the reliability, validity, and homogeneity of a scale (Boateng et al., 2018). Reliability is analysed by applying the scale to the same sample again to test whether the scale also measures the same in a repeated measurement. The validity can be tested by using the scale to differentiate between known groups (Boateng et al., 2018). The homogeneity can be analysed using multivariate methods such as factor analysis and Cronbach's alpha (Cronbach, 1951; Thurstone, 1931).

This study evaluated the fashion scale based on fashion interest and fashion shopping behaviour developed by Weber (2015b) by adding a sample of fashion students as a control group. A principal component analysis was used to explore the homogeneity of the questions

used to create the fashion scale (Wold, Esbensen, & Geladi, 1987); and differentiation by known groups (Boateng et al., 2018) was used to test the scale validity.

The original study by Weber (2015b) took a random sample from the Province of Ontario, Canada to determine the fashion index. However, their scale was not normally distributed but skewed to the left. Hence, either people in Ontario have a low fashion interest, or the questions to determine a person's fashion index were not suited to describe fashion interest.

To analyse the validity of the scale based on the differentiation between known groups, a fashion interested sample that consists of college fashion students was added to the Ontario random sample. Fashion students are highly interested in fashion and should therefore have a higher value in their fashion scale than the participants of the random sample from Ontario. During the winter semester of 2017, 268 students were contacted and encouraged to answer the questionnaire. A total of 228 students participated in the study, and all completed the questionnaire.

In line with Weber (2015b), the present study also used parametric statistical methods to evaluate the scale. To analyse the homogeneity of the scale, a principal component analysis (PCA) was conducted. PCA analyses the loadings of the items on the first factor and the variance explanation through the first factor. In contrast to Cronbach's alpha (Cronbach, 1951), PCA was less vulnerable to a high number of items (Wold et al., 1987).

To test differences between the random sample and the student sample, we used T-tests to analyse differences between the random sample and the student sample. Furthermore, we used multi-factor analyses of variance (ANOVA) to analyse the impact of more than one factor on the fashion scale. Finally, we used Chi^2-tests to analyse categorical data.

2.4 Results

First, we compared the physical attributes of the total sample with the random Ontario sample and the student control group. The geo-demographic geographic criteria included gender, age range, marital status, years living in Canada, and income distribution.

The sample consisted of two groups, 231 fashion students and 422 participants from a random sample in Ontario. Altogether, the total sample consisted of 653 participants. Of those, 232 identified as male, 414 identified as female, and one participant indicated 'other'. When comparing the two samples with a Chi^2 test, results showed that the Ontario sample consisted of 51 percent female and 48 percent male, while the student sample was 87 percent female, 13 percent male, and one participant indicating 'other'. Therefore, the gender distribution of the Ontario sample reflected the gender distribution of the province of Ontario: 52 percent female and 48 percent male (Statistics Canada, 2011), while the percentage of females was higher in the student sample.

Figure 5 shows an analysis of the age ranges in both samples. The Ontario sample was close to the Ontario population, except in the age range above 65 years, where the sample was 3 percent lower than the numbers from Statistics Canada (Statistics Canada, 2011). The student sample was younger than the random sample ($p < .0001$, $Chi^2 = 257.76$).

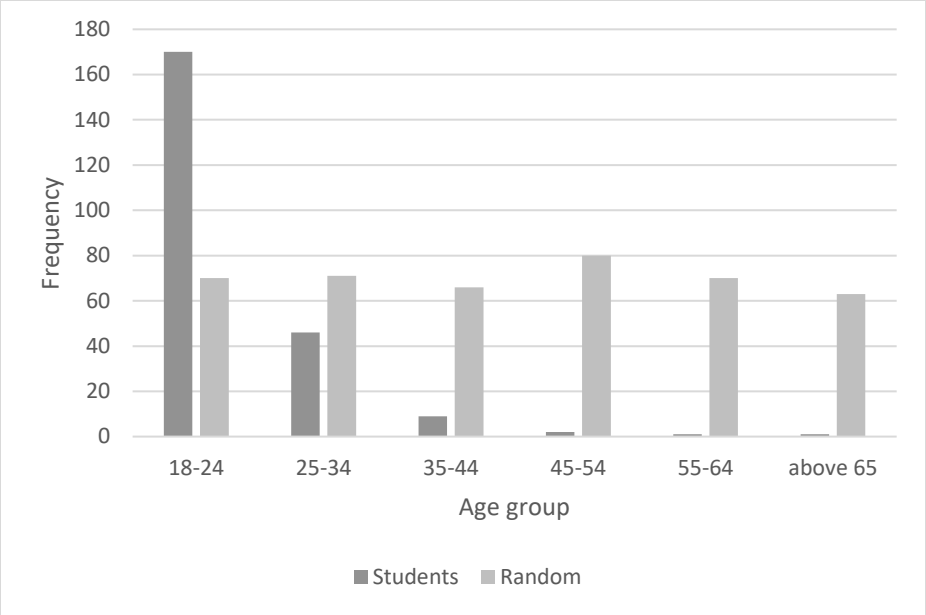

Figure 5: Distribution of the age range

Marital status was determined to describe the samples further. Out of 653 participants, 252 participants were single, 81 were single living with their parents, 150 lived with their partner or were married, 120 lived with their partners and children, and 25 indicated 'other'. At the same time, a comparison between the random Ontario sample and the students resulted in a statistically significant difference ($Chi^2 = 163.3$, $p < .001$). Fashion students were more likely to be single and living with their parents than the random sample.

Furthermore, the income distribution in the sample is presented in Figure 6. However, to compare the two samples, we conducted a Chi^2 test. While the result suggested that the Ontario sample represented all income levels, the high-income levels between CAN 75,000 and 250,000 and above were about five times as high as numbers from Statistics Canada. (The sample had 30.8 percent above an income of CAN 75,000 while the province had 5.6 percent (Statistics Canada, 2014; Weber, 2015b). The Chi^2 test indicated that the fashion students had a lower income than the random Ontario sample ($p < .0001$, $Chi^2 = 228.69$).

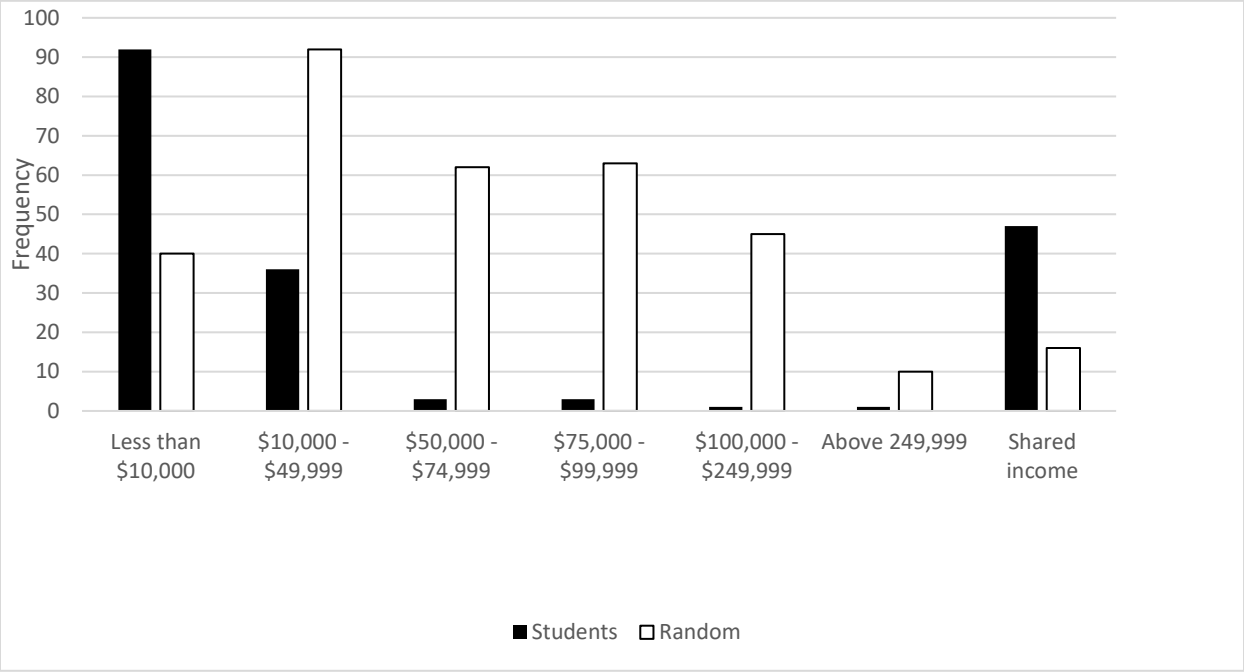

Figure 6: Personal income per year

As the analyses above showed, both samples were different in the demographic criteria, and there was more value in comparing the groups than looking at the total sample. Therefore, this section mainly compared the samples regarding the psychographic attributes. We begin with the behavioural criteria—how often the participant shops—before we look at the participant's fashion interest.

The distribution of the question, 'How often do you shop for clothes?' split by the random sample and the fashion students is presented in Figure 7.

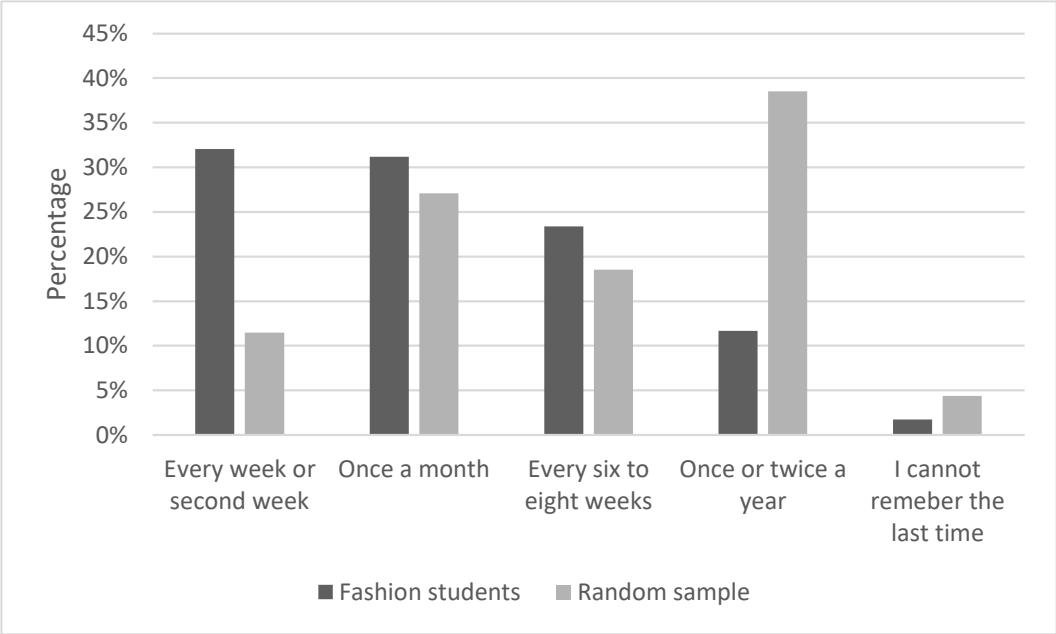

Figure 7: Percentage distribution of the shopping frequency of fashion students and random sample

The results showed that compared to the random sample, nearly three times the number of students went shopping every or every other week. The highest percentage, 39 percent, for the random sample was in the category 'shop only once or twice a year', while more than half of the students, 63%, shopped at least once a month.

Before comparing the sample in regards to fashion interest, we analysed the agreement with the questions of whether the participants bought clothes often even if they did not need them (= 3.42; =2.66; $p < .0001$), whether they were concerned with the practicality or timelessness of the clothing whether it could still be worn the following season (= 3.35; =3.13, $p = .015$), and whether they purchased new clothing more often than their friends (=3.32; =2.70; $p < .0001$). The questions were answered on a five-point Likert type scale with 'strongly agree' (1) to 'strongly disagree' (5). The T-tests for all three questions and the sample origin as an independent variable were significant.

2.4.1 Scale Homogeneity

Next, we conducted a factor analysis to explore the homogeneity of the fashion scale. The first factor explained 94.98 percent of the total variance (Eigenvalue = 10.51). The variance explanation of the second factor was 4.67 percent; therefore, we assumed that there is one main homogeneous factor. The loadings of the items on the first factor were higher than 74 percent with the exception of the item 'I am not concerned if clothing is practical or timeless and can still be worn in the next season' (see Table 1). The loading of this item was .34. Because the loading on the first factor was still the highest, we calculated the fashion index using the sum of the scores for the 16 questions. The maximum value was 80, indicating a high fashion index.

Table 1: Factor loadings

Variable	Loading
Q7_1: I seek out new fashion trends and I spend a fairly high proportion of my income and time on fashion.	0.88
Q 7_2: I read the fashion news regularly and try to keep my wardrobe up to date with fashion trends.	0.84
Q7_3: I usually try to be different from others by wearing fashionable clothing.	0.79
Q7_4: I am interested in shopping at fashion specialty stores rather than department stores for my fashion needs.	0.78
Q7_5: I am usually the first among my friends to buy the latest clothing styles.	0.89
Q7_6: Compared to my friends, I own more of the latest fashion styles.	0.88
Q8_1: I think I am a trendsetter, and my clothes are very fashionable.	0.84
Q8_2: I am usually the first to know the latest fashion trends.	0.87
Q8_3: My friends regard me as a good source of fashion advice.	0.84
Q8_4: I like to buy new clothing early, just when the fashion trend begins.	0.87
Q8_5: I follow the fashion styles of celebrities and I find they influence my fashion purchasing habits.	0.79
Q8_6: I often influence the types of clothing styles my friends buy.	0.80
Q8_7: I usually buy clothing because I am thrilled by a new fashion trend.	0.85
Q10_1: I buy new clothing often, even if I don't need it.	0.75
Q10_2: I am not concerned if clothing is practical or timeless and can still be worn in the next season.	0.34
Q10_3: I purchase new clothing more often than my friends.	0.281

In addition to the factor analysis, we analysed the scale using Cronbach's alpha (Cronbach, 1951). The analysis of the total sample resulted in α = .97. The random sample's value was α = .97, and α = .90 for the fashion students. All values suggest a high homogeneity of the scale.

2.4.2 Differences Between the Samples of Fashion Interest

The average for the different components of the fashion index split by the random sample and the fashion students are presented in Figure 8. For every question, the figure suggests a higher value for the fashion students than for the random sample.

Figure 8: Item difference between the two sample groups

We conducted a T-test to analyse differences between the fashion students and the random sample for individual items and the fashion scale. The values for the individual items as well as for the fashion scale were significantly higher for fashion students than for the random sample ($p < .0001$ for all items and the fashion scale with the exception of Q10_2 ($p = .015$)).

To analyse whether the differences were caused by other external variables that correlate with the origin of the group, we calculated an ANOVA (analysis of variance) with the fashion index as dependent variable and gender, age group, income, and sample group as independent factors (see Table 2). The model was significant ($p < .0001$) with $r^2 = .35$. All variables had a significant effect on the fashion scale.

Table 2: ANOVA with fashion index, age group, income, and sample group (random sample vs. fashion students)

Source	df	F	p
Model (all factors)	16	18.76	<.0001
Gender	2	4.5	.0115
Age	5	28.09	<.0001
Income	8	4.96	<.0001
Sample	1	13.67	.0002

First, female participants in the Ontario sample had an average fashion scale value of 50.41, while male participants scored at an average of 43.25. Male participants from the fashion school, however, had a significantly higher fashion score than their female counterparts ($p = .0045$, $F = 5.53$, $N = 227$).

Further, we present the fashion scale results split by age group (see Figure 9). The results demonstrate that 18 to25-year-old respondents had the highest fashion interest, followed by the 35 to44-year range. There was a decreasing trend in fashion interest after age 45, with fashion interest proving lowest after age 65.

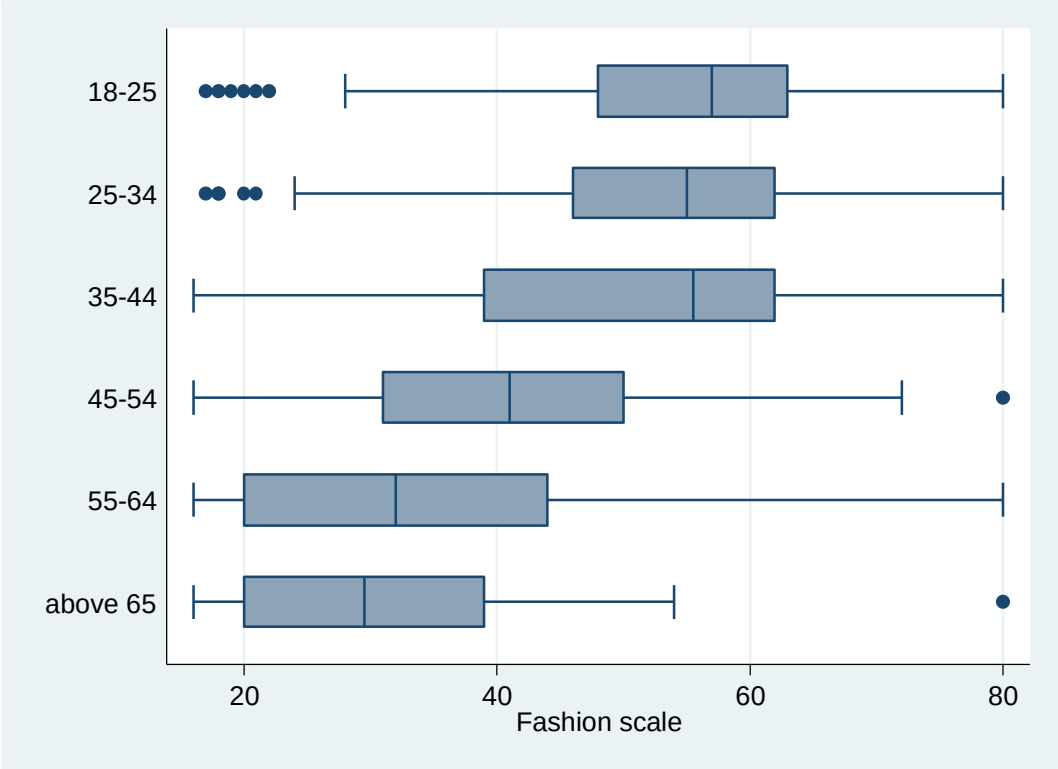

Figure 9: Fashion scale split by age group

A comparison of the fashion students and the random sample by age group is presented in Figure 10. Fashion students demonstrated a higher fashion interest than the random sample in all age groups.

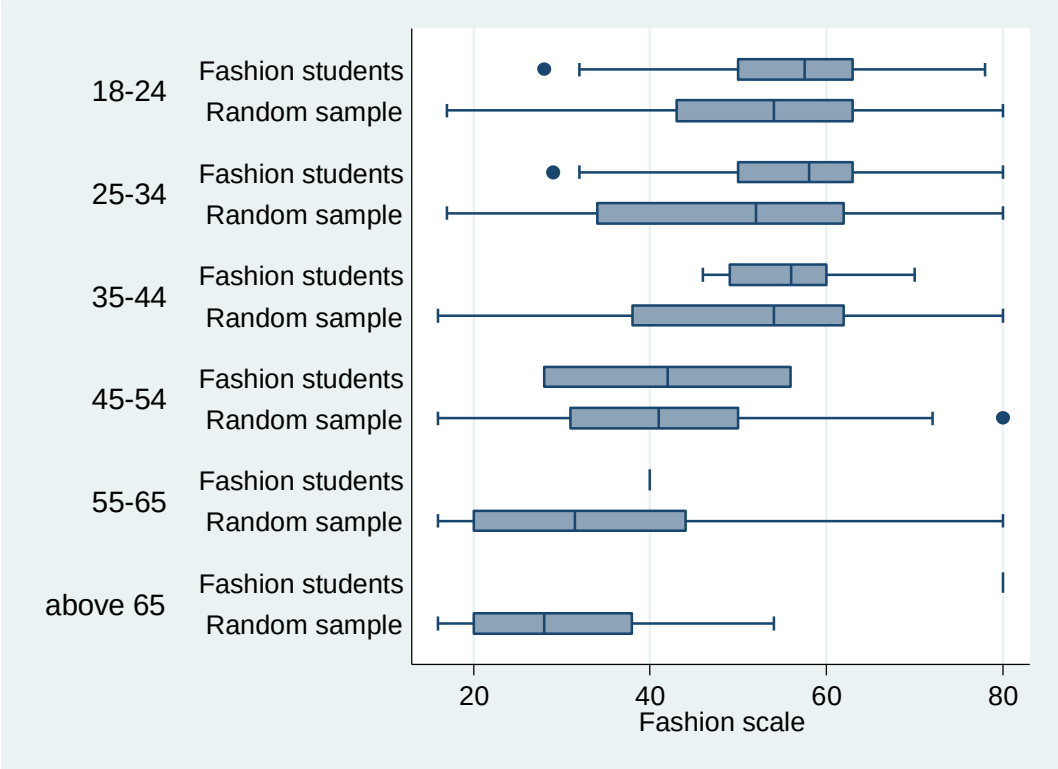

Figure 10: Fashion scale split by age group and sample

The fashion scale distribution of the fashion students against the random sample is presented in Figure 11. The results suggest that the random sample was skewed to the right while the fashion students' sample was skewed to the left, and that fashion students had a higher index than the random sample.

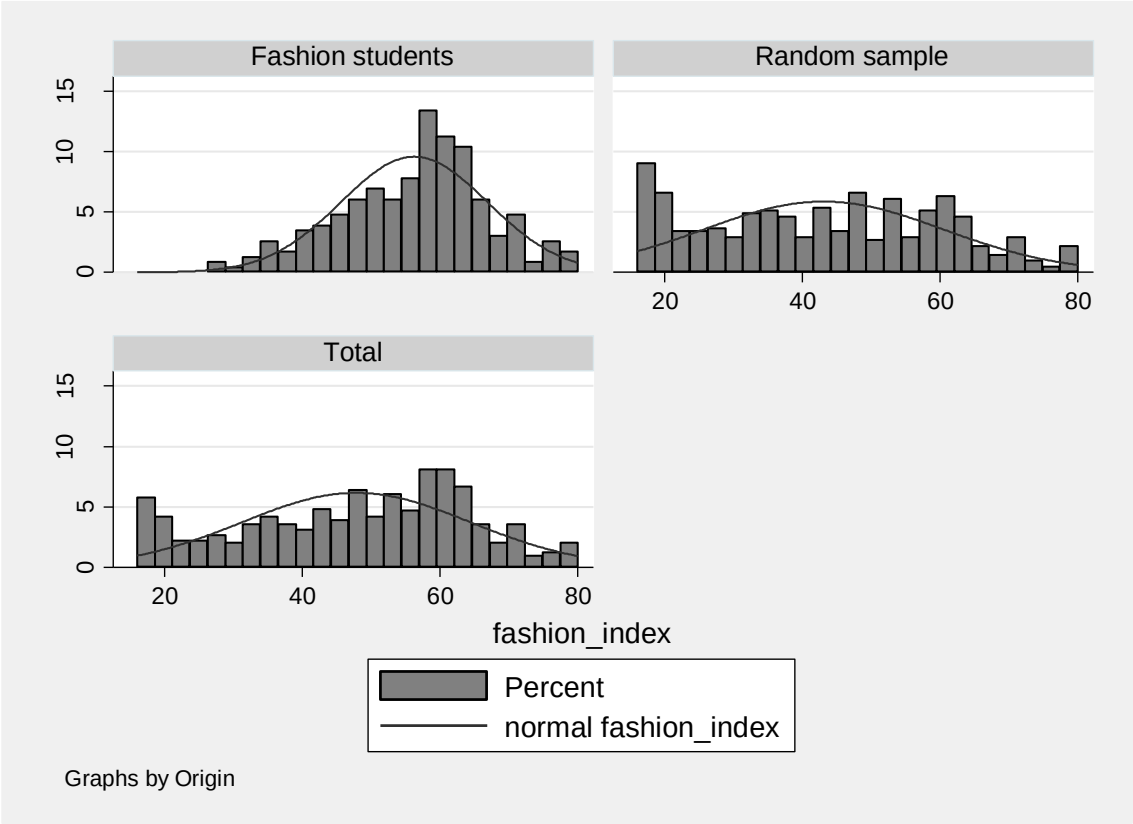

Figure 11: Percentage distribution: Sample groups and whole sample with regard to the fashion index

Furthermore, we present the box plots for the fashion index split by income in Figure 12. The highest fashion index value was found in the income group between CAN 100,000 -149,000. The results suggest that the fashion index was different for income groups but did not linearly increase with income.

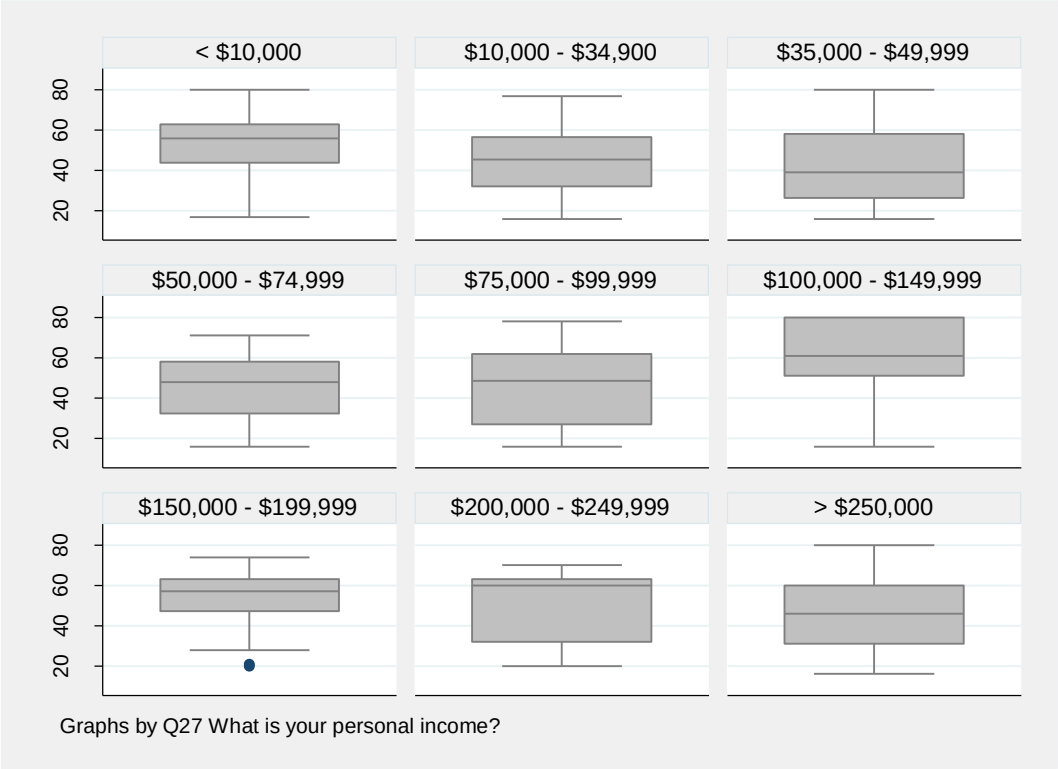

Figure 12: Box plots for the fashion index split by income

Figure 13 presents the box plot split by sample and income. It suggests that the students had a higher fashion index in each income group than the random Ontario sample. This result also explains that fashion index did not increase with income. Usually, students do not have a high income, but they had higher values on the fashion index.

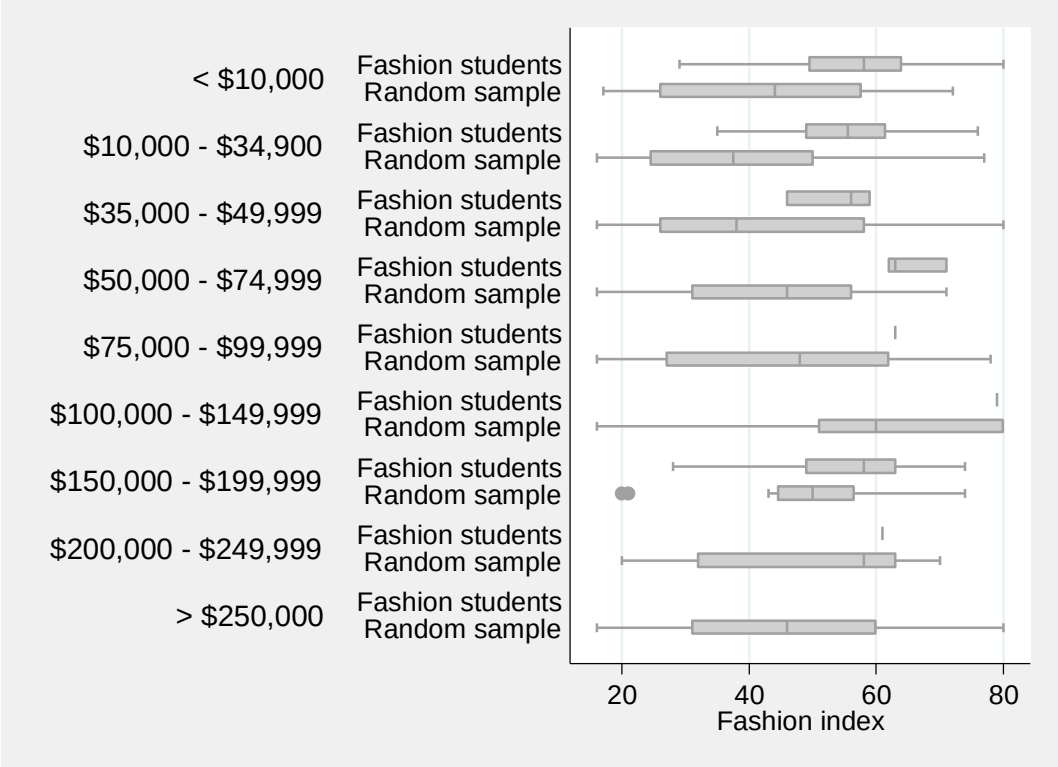

Figure 13: Box plots for the income group by sample group

2.4.3 Shopping Frequency and Fashion Scale

We also tested whether there were differences in the fashion scale for high frequency and low frequency textile shoppers using an ANOVA. The ANOVA was significant ($p < .0001$, adjusted $r^2 = .58$). Both sample group and shopping frequency were significant ($p < .00001$ for both). The interaction between the two independent variables was significant as well ($p < .00001$). The results are presented in Figure 14. They suggest that fashion students had higher values, but that the shopping frequency and being a fashion student interacted. While both groups were very similar in the fashion scale if they were high-frequency shoppers, this differed for low-frequency

shoppers. Even if the fashion students did not shop that often, they had higher fashion scale values than participants from the random sample.

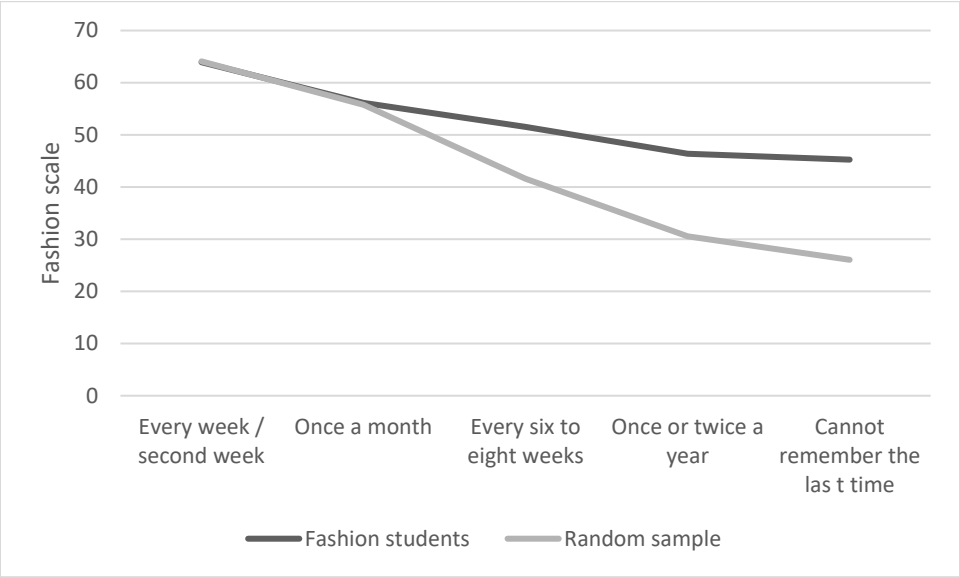

Figure 14: Shopping frequency and fashion scale for fashion students and the random sample

2.5 Discussion

This research validates the fashion scale developed by Weber (2015b) which successfully differentiated between established groups of high and low fashion interest. The results indicate that the questionnaire is suited to determine the fashion interest of a person because both samples had a significantly different fashion interest. The control group of fashion students, which had a higher percentage of females and was younger in age, confirmed the anticipated results of having high fashion interest. This means the questionnaire truly measures what it intends to measure, namely, fashion interest. Having a validated questionnaire that measures fashion interest offers a benchmark that can help other researchers who are seeking to use fashion interest as a criterion and to combine it with other factors. Further studies that integrate fashion interest as a criterion will also deepen understanding of fashion interest and clothing consumption.

We analysed the reliability of the questionnaire by analyzing the homogeneity of the questions. The analysis of the homogeneity has shown that all sixteen-survey questions of the fashion scale have a high homogeneity; this means all questions have a high consistency with fashion interest, and that none of the questions needs to be discarded or revised. Further, the homogeneity is valid for both sample groups, indicating that the questions are strongly interrelated with one another and that the questionnaire consists of a sufficient number of questions. Therefore, all questions are suited to determining fashion interest, making the questionnaire highly reliable. Moreover, the questionnaire from Weber included ten questions from the research conducted by (Lang et al., 2013, p. 711), and although the researchers did not provide the Cronbach's alpha value for each question, they displayed some values. However, only Lang et al. (2013) analysed the reliability of their scale to determine trend sensitivity using fifteen questions, with ten of these questions included in the research from Weber (2015). The value for alpha in the Lang et al. study was 0.93 compared to 0.97 in the present study. Similarly, Lang et al. (2013) developed three questions to evaluate shopping frequency, from which Weber integrated two of them. The value for alpha was 0.86. While the Morgan and Birtwistle (2009) study was a combination of a structured survey of consumer focus groups and consumer interviews, the survey results of the section fashion innovativeness had an alpha coefficient of 0.703. The current study, however, has gone a step further in analyzing the reliability using principal component analysis (PCA). PCA is less vulnerable to the number of items and therefore more robust in assessing the homogeneity of a scale that consists of a high number of questions. Though Tigert et al. also conducted a principal component analysis, their loading was lower than in our study. Furthermore, they did not disclose the variance explanation of their scale. The present study demonstrates that the items in the first factor explain 94.85 percent of the variance, consequently contributing to the academic literature by providing a reliable and unidimensional fashion scale.

The main objective of the research was to provide not only a unidimensional and homogeneous fashion scale, but also a validated one. Other studies, such as Lang, Armstrong, and Brannon Lang (2013a), E. J. Park et al. (2006), Tigert et al. (1976), Weber (2015b), and Sproles

and King (1973), also analysed fashion-related activities and behavioural dimensions. They used distinct continuums rather than defined groups to reflect and segment markets. While a continuum in combination with Likert scales allows for the use of parametric statistical procedures, it also provides more accurate results in contrast to grouping people into specific categories. However, none of these studies focused on fashion interest, and none of them validated their scale with a control group focusing on the validation of the questionnaire itself. Considering the long history of fashion scales, validating the fashion interest scale was long overdue. Therefore, this study contributes to the knowledge of fashion interest scales by providing a validated scale.

The results of this study also indicate that fashion interest depends on gender identity, with females displaying higher fashion interest than males. This finding aligns with previous studies that determined that females have significantly higher fashion trend sensitivity (Lang et al., 2013) and are more involved in fashion (O'Cass, 2004; Tigert et al., 1976). An exception are male fashion students, whose fashion interest is higher than their female colleagues. Bakewell, Mitchell, and Rothwell (2006) studied the fashion consciousness of male consumers from Generation Y. When the research was conducted, the generation cohort group Y was under 25 years old. They found that men recognize fashion and their relationship to it as a binary of either being or not being fashionable, with the former encompassing fashion consciousness, fashion knowledge, liking fashion, and consumption practices. Our study, however, could provide more detailed results because of the use of a multi-item continuous scale. This might explain why male students who study fashion might be more committed to fashion than their female counterparts.

O'Cass (2004) further reported that younger participants are more involved in fashion and found that younger age correlates with fashion trend sensitivity. We can confirm that fashion interest is dependent on age and that the youngest age group exhibits the highest interest in fashion. Moreover, Birtwistle and Moore (2007) claimed that females in the age group 18-25 years are not only more interested in fashion, but also purchase more fashion garments than older people and go shopping more frequently. This finding aligns with our study in that fashion

students have a lower income than the random sample but go shopping for clothes more often. This finding can only result from a continuous scale that allows to analyse interactions. Furthermore, more than a third of the students go shopping each week or every other week.

Although the fashion index does not increase with income (a finding also confirmed by Morgan and Birtwistle (2009)], who could not find correlations between fashion innovativeness and annual household income), people with high income are more likely to be interested in fashion. Results from the Ontario sample show that people with an income of between CAN 100,000 -250,000 have about the same high fashion interest as fashion students. These results suggest that fashion either needs to be cheap and affordable for younger customers or a luxury for those who can afford it. Hence fashion is split into luxury brands and fast fashion, the latter one being described in the literature as low-cost clothing that attracts young consumers and copies current luxury fashion trends (Joy, Sherry Jr, Venkatesh, Wang, & Chan, 2012).

2.6 Limitations and Further Research

This paper provides a fashion scale to describe peoples' fashion interest. The sampling size looked only at the perspectives of a sample from the province of Ontario, Canada and at students enrolled at a fashion college in the same province. This scale has yet to be considered for other markets and territories. More research from additional areas like China and India is needed to determine whether this scale is generalizable to other demographics. Further, qualitative research conducted with various demographics would give a richer understanding of the fashion interest and fashion consumption preferences of different markets.

This study validated the fashion interest scale with a control group, but a test-retest evaluation, where the responses from individuals to the questionnaire remain relatively the same, would further strengthen the reliability of this questionnaire (Tsang, Royse, & Terkawi, 2017). A high internal validation ensures that responses are not random but instead reproduce

the same results repeatedly, providing quality data that are stable and representative. On the other hand, people change their attitude and behaviour over time, so it would be useful to determine the effects of these changes on fashion interest. For example, do fashion students maintain their fashion interest once they get older and work in the industry, or does it drop to the same level as the random sample?

The purpose of this paper is not to evaluate or judge whether consumers are fashionable, but to develop a tool to determine a person's fashion interest and to segment markets according to fashion interest and shopping behaviour. Future research may explore the applicability of this fashion scale as a market segmentation tool to different social and cultural groups and other behaviours and attitudes, such as the acceptance of new business models, online shopping, or even environmental activities.

2.7 Conclusion

The validated scale can reflect the entire spectrum of fashion interest ranging from highly interested to non-interested fashion consumers to emphasize that not all consumed clothing is fashion. Based on the fashion index, the differences in fashion interest among customers can be used as a segmentation criterion for markets, but also to relate fashion interest with other attitudes and behaviours. Researchers in sustainable fashion claim that transforming the fashion industry requires determining customers' motives for using and buying clothes, the size of the different market segments according to their fashion interest, and the opportunities for new business models to meet their needs (Ellen MacArthur Foundation, 2017, p. 30). This study can help to determine the different market interests according to their fashion interest by providing a tool to segment the markets.

MANUSCRIPT ENDS

CHAPTER 3: Drivers of Clothing Consumption

The previous chapter outlined the difference between fashion and clothes as a means to showing individuality and group belonging while presenting a validated fashion scale to determine a person's fashion interest. The manuscript showed that only a small portion of people are interested in fashion; hence, other factors drive clothing consumption. To better understand how fashion's mass-consumption has become such a resilient part of the global economy, this chapter further analyses clothing consumption drivers to answer the research question: "Why are we consuming so many clothes?" To answer this, the following literature review considers how the fashion industry's historical context and the political economy in North America have influenced fashion consumption (see Figure 3). Since the full fashion history is beyond this dissertation's scope, the most important time periods of fashion consumption are explored to better understand the gradual increase in consumption. This section traces the split between the producer and consumer and fashion production's impacts during the Industrial Revolution. It concludes with the twentieth century with a description of fast fashion—an outcome of the last century's political economy and how low garment prices have led to low garment utilization. It ends with a description of how the disconnect between the producer and consumer reinforced fast fashion. Exploring this historical context contributes to the sustainable fashion literature by clarifying the present difficulties with decreasing consumption and achieving sustainability.

3.1 Clothing Consumption from the Twelfth Century to the Industrial Revolution

To better understand the relationship between production and consumption, it is necessary to analyse its historical development of the fashion system. Using clothing styles to show identity or group belonging, as practised by the clergy or bourgeoisie in the Renaissance period (Loschek, 2009), set the stage for the current fashion system that uses changing fashion cycles to create trends.

The invention of the tailor profession in Medieval European society represented the first time that clothing manufacturing became a codified profession; clothing production could now be outsourced by individuals to an external apparatus, allowing clothes to be made according to individual demands. In Medieval Europe, clothing was used to demonstrate orders and to separate "between religious […] and state-political contexts of meaning and function". After the 15th century, fashion is documented as an individual form of clothing (Loschek, 2009, p. 19). The split between producer and consumer's desire of individualized clothing spurred demand for clothes, requiring an increase in production units. This created different social groups or 'classes', which differentiated not only by their clothes, but by whether they owned the means of production (Duménil & Lévy, 2012).

The importance of fashion increased during the 17th century as it came to express the class conflict of a capitalistic society—the fight between bourgeoisie and aristocrats (Godart, 2012). While the bourgeoisie used fashion to distinguish their "economic position, social status, or cultural affiliation" from the aristocrats', the aristocrats reacted and developed their own fashion styles (Godart, 2012, p. 29). Since the Renaissance, fashion "turned toward less confrontational identity", but people continued to use fashion to demonstrate their social affiliations, "the circles to which they belong" (Godart, 2012, pp. 29-30). Until the Renaissance, fashion had been solely for the upper class. The lower classes—the majority of the population—were excluded from fashion and any kind of consumption because they could not afford to waste any material, or to change items because they were in or out of fashion (Godart, 2012). Even in the present, people continue to use fashion to reflect considerable personal values and to express individuality (Davis, 1994; von Busch, 2012).

Before the Industrial Revolution, people mainly sewed garments by hand at home for personal use (Beaudoin-Ross, 2013). England was the first country to mechanize textile manufacturing with the invention of the 'flying shuttle' loom in 1733 by John Kay to satisfy consumer demand for cotton fabrics. More fabrics were produced in less time (Frings, 2008, p. 8) and helped launch the Industrial Revolution in Britain.

The invention of the sewing machine by Isaac Singer in 1851 inaugurated the mass production of clothing in North America (Frings, 2008). Sewing machines were first used by home tailors. Industrious businessmen quickly realized that bringing workers together in one place to sew garments would save time and offer better control over the production process. The apparel factory system was born. Apparel production increased, making ready-made apparel more available (Frings, 2008). With the Industrial Revolution, clothing production moved from homemade to custom-made clothing (or made-to-measure) sewn by local tailors and dress makers, and eventually as "ready-made" or "off the rack" clothing (Dias, 2008, p. 66). The Industrial Revolution made fashion a status symbol, a visual means by which to show off wealth, and consequently increased consumption (Frings, 2008, p. 9). Along with this wealth came a split in society into capitalists, those who owned the productions and were striving for profit maximation, and Proletarians, those who sold their labour force.

3.2 The Twentieth Century and the Creation of Fast Fashion

The twentieth century witnessed profound changes in the dissolution of the social classes and the shifting status of the family, leading to a profound liberation and emancipation in the individual. This process of individualization, a concept which refers to the increasing need for individuals to be responsible for their own lives in the face of increasing globalisation (Beck, 1992), has ironically led to a distinct reintegration of the individual into the social sphere of production and thus a dependency on these institutions (Beck, 1992). People are becoming increasingly individualized, living outside the traditional family structures and thus are more dependent on the labour market as a means of financial income. Individualization increases dependency on the labour market, which holds power to consolidate social and political institutions according to market conditions (Beck, 1992). Thus, the same institutions which enable emancipation bring with them profound standardization (Beck, 1992).

Mass fashion emerged in the twentieth century with the rise of mass industrialization and North America's ability to produce knock-offs of couture designs from Europe (Cooper, 2011).

Two developments strengthened the fashion industry in the 1920s. The first was an increased income among the working class, which lead to a wave of mass consumption. The second was the efforts of Edward Bernays. Bernays famously advocated using propaganda to integrate public and industrial spheres to manipulate what he viewed as society's herd instinct (Curtis, 2002). Bernays believed propaganda could serve as a civilizing process whereby the poorer classes could "transform themselves, through smart consumption, into happy and presentable Americans" (Bernays & Miller, 1928). Bernays inspired American corporations to consider innovative means of spurring the desire to shop through the use of psychoanalysis to associate mass-produced goods with their unconscious desires (Curtis, 2002). Consumers were keen to own products, and manufacturers were eager to produce.

By the late 1970s and early 1980s, the industry saw a decline in consumer demand for products as well as increased overall costs in labour, energy, and material (Burns, Bryant, & Mullet, 2012). For the first time, people had more 'stuff' than they needed (Lewis, 2011) . 'At risk' apparel companies either went out of business, merged with other companies, were bought out, or invented ways to entice shoppers into their stores to create 'demand' in the consumers' minds (Burns et al., 2012, pp. 24-25). Thus, 'marketing' as a business strategy became a necessity within the fashion industry (Lewis, 2011), and with it, price began to play a significant role in all purchasing decisions. The financial imperative to maintain a competitive edge and satisfy consumer desire for cheaper products led the industry to search worldwide for the cheapest labour markets (Kunz & Garner, 2011), a trend also described as the race to the bottom (Meisel, 2004). This trend was further pushed through the internet and the removal of trade barriers.

The displacement of production facilities offshore, from Europe and Northern America towards Asia, reduced prices but also provided opportunities for new, more flexible supply chains by using multiple companies to produce clothing simultaneously and to increase production capacity. The speed and efficiency by which clothing could be made allowed for clothing to be sold cheaply and in larger quantities. Likewise, to stay competitive, manufacturers had to become retailers, and retailers became their own managers for their production partners in Asia. The lead

time from the garment design until it was ready for the "store floor" decreased. This offered the opportunity to develop not only two collections a year, but four soon became six, ten, twelve; and today some fashion retailers have new collections every other week.

This coordination between mass consumption and mass production in the 1980s led to the emergence of a mode of hyper-consumerism, typified by a new kind of fashion called "fast fashion"—fashion consumed at an even faster and higher annual rate (Barnes & Lea-Greenwood, 2006). Sull and Turconi defined fast fashion "as a retail strategy of adapting merchandise assortments to current and emerging trends as quickly and effectively as possible" (Sull & Turconi, 2008, p. 5) while other features include low price, perception of product scarcity, and the rise of synthetic fibres. While fast fashion has been often criticized for environmental degradation, labour abuse, and fostering unconscious shopping behaviour, others see fast fashion as democratizing fashion, offering affordable clothing to the masses (Sull & Turconi, 2008).

Fast fashion has influenced every segment in the fashion industry, and today even luxury brands have become more affordable and have developed more collections than ever before (Okonkwo, 2016). The difference between different sectors have further diminished through consumer consumption behaviour, a phenomenon described by Keiser and Garner and coined 'masstige': the convergence between mass-market and prestige retailing (Keiser & Garner, 2012). Today, a brand can be "high end and mass at the same time" (Keiser & Garner, 2012, p. 89). High-income customers mix their luxury fashion garments with discount apparel; and low-income customers are indulging in luxury labels for a few pieces—customers willingness to mix luxury with cheap shows that consumers choose what they like and can afford. Since fast fashion and luxury fashion lines offer the same fashion trends, they can easily be combined. There is no clear line between mass or fast fashion and luxury fashion; instead, it is a fluid transition between the business strategies that keep mutually influencing each other. Likewise, customers are purchasing the products depending on their personal income situation. To stimulate

consumption, the fast-fashion retail strategy has turned into a fast-money-making business strategy for all fashion sectors based on low or lower prices and everchanging fashion circles.

3.3 Price as an Accelerator for Fashion Consumption

Coleman (2017) analysed how regrettable clothes end up in peoples' closet and found out that the attraction of low prices combined with a designer name for customers is so high that they can not resist. With a drastically reduced price, people buy clothes even if the garment makes its wearer look ridiculous (Coleman, 2017).

Fashion prices are elastic. This means that the demand for fashion goes up if prices decrease. It is no wonder that the industry is driven to keep costs low to sell more by increasingly outsourcing garment production to developing nations. Ever-decreasing prices have led to a level of fashion consumption unparalleled in history (The American Apparel & Footwear Association, 2014b). Figure 15 shows the relationship between fashion prices and clothing consumption. The red line shows how garment prices have steadily declined since globalisation began in the 1980s, leading to an increase in fashion consumption (the blue line).

Fast fashion no longer aims to show individuality or group belonging but has instead become a substitute for other unsatisfied needs (Rick, Pereira, & Burson, 2014). Just as Bernays and Miller intended, shopping has become a means to coping with any problem and has become synonymous with our pursuit of happiness (Bernays & Miller, 1928). Shopping as a leisure activity (Bäckström, 2011) and retail therapy (Pratt, 2004) has become its own field of research, with fashion companies catering to this desire and belief. For example, Town Shoes recently advertised that "Shoe shopping is cheaper than a therapist" (Town Shoes, 2015). Governments have even encouraged their residents to go shopping in response to national tragedies. In the wake of increasing concerns over the prolonged Iraq war and national security concerns, President George W. Bush reminded Americans to get over their fears by going shopping (Bush, 2006).

Jackson (2011) argues that people have become addicted to consumerism to participate in social life. The pursuit of fashion consumption has become synonymous with our pursuit of happiness. Low garment prices made it possible for consumers to purchase garments on a weekly basis but generated the problem of storing all the new clothes. First, consumers increased their closet's size, an average of 60 percent in North America since the 1960s, but soon this was not enough (Jana Hawley, 2007). The industry responded by making garments less durable and no longer repairable, but ultimately the solution was to decrease garment utilization to make space for the next purchase. Fashion then became 'disposable' or 'throwaway' (Bhardwaj & Fairhurst, 2010). The following section further explores the concept of low garment utilization.

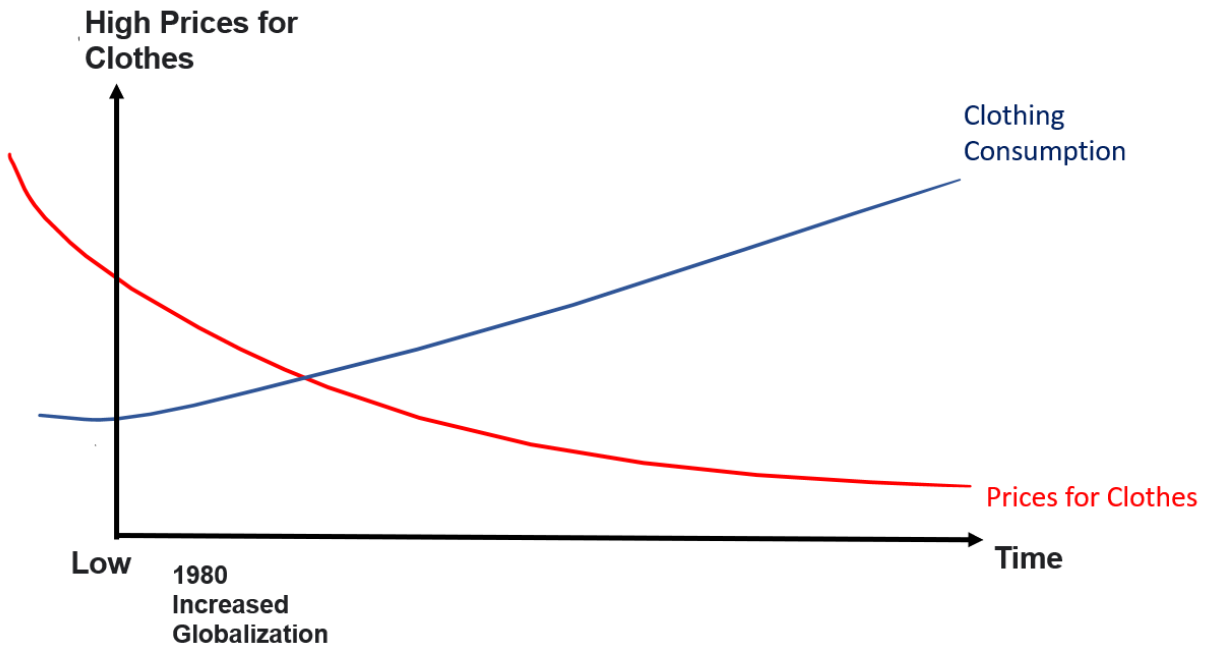

Figure 15: Connection between dropping prices for clothes and increased clothing consumption

Source: Created by the author

3.4 Low Garment Utilization as an Accelerator for Fashion Consumption

In 1932, Calkins introduced the term 'Consumer Engineering' as a business tool to stimulate the consumption of goods. Calkins defines consumer engineering as the process of constantly modernising and adjusting all products so that they stay relevant for consumers "to keep pace with their rapidly changing habits and ways of living" (Sheldon & Arens, 1932, p. 2). Calkins emphasises the importance of consumers consuming a product quickly, as right from the moment it gets into their hands.

Products can be classified into two categories: products that consumers use, such as cars or phones, and products consumers use up, such as toothpaste or cigarettes. Consumer engineering ensures that products for use are consumed as products that are used up (Sheldon & Arens, 1932). Since the Industrial Revolution in Britain, around 1750, fashion, a product for use, has gradually transitioned into a product for using up. While consumers are buying more clothes, a study from the UK found that the average clothing item is only worn seven times before being discarded. This discarding occurs because customers want to avoid being seen twice on social media wearing the same garment (Maybelle, 2015). In a similar vein, Remy, Speelman, and Swartz (2016) claimed that clothing is deemed 'old' after only three years (Remy et al., 2016). Although these studies were conducted in Europe, similar attitudes and behaviours of North American consumers are reported. The Ellen MacArthur Foundation (2017) defines the number of times a garment is worn as "clothing utilisation". While clothing utilisation has globally decreased, in the US, "the clothes are only worn for around a quarter of the global average" (C&A Foundation, 2016, p. 16). Today, consumers own more garments than ever before. Although peoples' closets have increased in capacity—for example, Jana Hawley (2007) reported that the modern American home closet has increased by an average of 60 percent since the 1960s—most people do not have enough space in which to store their clothes. As a result, North American

consumers produce 37.2 kg of textile waste per year, from which 85 percent ends up in landfills (Council for Textile Recycling, 2014).

As outlined in the previous sections, fashion is reflective; it is a mirror of a specific time and place. People use fashion to express their individuality but also to show their group belonging. Supported by the political economy, globalisation, and reduced garment prices, garment utilization dropped. Lower prices incentivized customers to buy more clothes. However, the driver for mass fashion, common under the term fast fashion, goes back to the invention of the tailor, and the novel idea that the producer and the consumer of a garment could be a different person. The Industrial Revolution made garments widely available as production moved from homes into factories. Globalisation further increased the distance between producer and consumer; and today, people in the western world can no longer describe how garments are produced. The following section examines the consequences of the disconnect between producer and consumer.

3.5 Effect of Globalisation and Disconnect between Producer and Consumer on Waste Generation

The fashion industry has fully embraced globalisation. About 97.5 percent of apparel sold in the United States is produced offshore (The American Apparel & Footwear Association, 2012), causing an imbalance between local and global production. This has led to various consequences. People in industrialized countries have lost the skills needed to produce garments, are heavily dependent on new and newly developing countries, while the few remaining production facilities in developed countries struggle to find skilled labour.

Likewise, if people are not able to produce a garment, they also lose the knowledge and skills to repair or mend it. Furthermore, they cannot imagine how much time and effort goes into the production of a garment. Gibson and Stanes found that younger generations lack the skills to do even minor clothing repairs such as sew on buttons or fix hems. If a repair is necessary, it is

usually done by parents or grandparents. If they are not available, items will be discarded, because professional repair is seen as expensive (Gibson & Stanes, 2011)—hardly surprising, considering that the average price for a new garment in North America costs less than USD 15 (The American Apparel & Footwear Association, 2014a). Some consumers even think that wearing a visibly repaired garment is a sign of poverty. To protect their image, consumers dispose of garments even if they could be repaired (Goworek, Hiller, Fisher, Cooper, & Woodward, 2013). Consequently, people in industrialized countries can no longer replicate the work that goes into the making of a garment.

However, the disconnect between producer and consumer does not only influence the production, but also the design of garments. Fletcher outlines how most garments are designed, produced, and shown as "complete or closed" (Fletcher, 2008). This means that the customer has no influence on the design of the garment. Customers can only choose from ready-made garments, produced by dominant large retail chains, which are often indistinguishable from each other and based on the same measurements and fittings. Ironically, a lot of people try to express their individuality with ready-made garments whose meanings are primarily created outside of themselves (i.e., the individuality of the consumer) (von Busch, 2012). The lack of co-design prevents customers from connecting more deeply with the producer and the product. As a result, consumers are becoming passive, purchasing mass-produced items without meaning (Fletcher, 2008). Further, consumers have no connection with the maker, so they do not know who made their clothes and cannot imagine that a forced worker made their garments.

In conclusion, younger consumers can no longer understand the production process or the people making their clothes. They do not possess the skills to make and repair garments; hence, garment repair has lost its social validity. Further, the split between producer and consumer has made consumers passive, trying to express their individuality with mass-produced, ready-to-wear apparel. Customers often purchase uniform clothing without meaning and value; hence, customers are not attached to their garments, keeping them only for a short time.

Therefore, the disconnect between producer and consumer leads to increased unwanted clothes and eventually to more textile waste.

3.6 Summary, Conclusion, and Main Findings of Chapter 3

People use fashion to express their identity and show their group belonging; both motivations are strong drivers to the careful selection of garments. However, as outlined in the literature review, consumers love shopping for cheap clothes as a leisure activity or retail therapy, which is encouraged by our political economy. While fashion is used as a synonym for clothes, the difference has diminished, and today the term fast fashion describes the overconsumption of clothes. Low garment prices are possible due to global supply chains, and while garments are so cheap, it does not matter how often they are worn; this has a lead on the one side to low garment utilization and on the other to throw-away fashion.

This chapter outlines how the fashion industry has evolved and how it has adapted over time. It is a resilient industry, yet difficult to change.

Fashion production has become a business strategy to maximize profit as fast as possible. Fashion is no longer about individual style of dress; its consumption is driven by business interest.

Over the past century, the political economy has stimulated mass clothing consumption to make customers happy and avoid political upheaval. In addition to fashion companies and consumers, our political environment must change to make fashion sustainable.

The rule that determines the stability of the current fashion system is the price of garments. If prices were higher, garment utilization would increase, and consumption would drop (Figure 3).

In summary, Chapters 2 and 3 identified the following drivers for fashion and clothing consumption as:

- A person’s desire to be seen as an individual by looking different from others.
- A person’s desire to belong to a group by looking the same as others.
- The political economy encourages consumption as a means of happiness and has provided citizens with enough money to shop.
- The Industrial Revolution made mass production possible, but globalisation increased the speed to market fashion trends at low garment prices. At the same time, globalisation has led to a disconnect between producer and consumer; hence, consumers in developed countries lost the skills to do even minor repairs on their clothes.

CHAPTER 4: The Fashion System and Sustainable Fashion Concepts

While the last chapter identified the drivers of clothing consumption and described how the political economy has helped increase consumption, this chapter aims to answer the research question “Can fashion ever be sustainable?” and if yes, “What sustainable fashion concepts exist?” A literature review is conducted to outline today's fashion industry structure and its social and environmental impacts. Most importantly, this chapter outlines different sustainable fashion concepts as a response to the industry's unsustainable practices. There is a research gap in the fashion literature regarding sustainability efforts from fast-fashion retailers. Acknowledging that every fashion company is more or less sustainable is a first step to better understand how stringent the company is in its efforts given that resource depletion, environmental pollution, and labour exploitations continue. This chapter ends with policy approaches to push or not to push the industry toward sustainability.

4.1 Today’s Fashion Industry

All the business activities in an economy are organized around a dozen or so manufacturing, retail, and wholesale sectors. These sectors can be further broken down into industries with companies or businesses that conduct similar business activities. The fashion industry is the business of making and selling clothes. Making a garment starts with the creation of a staple or fibre in a fibre mill. [2] The raw materials for fibres are produced by the agriculture, forestry, and/or oil industries. Fibres are spun into yarns and the yarns are woven, knitted, or in a nonwoven process combined into fabrics. Fabrics are finished through different processes such as bleaching,

[2] Fibres are polymers of large molecular chains. Fibres can be constructed from plants and animals (natural polymers), from natural polymers of plants which are dissolved and spun (cellulosic manmade fibres) or from petroleum products (synthetic manmade fibres) (Eberle et al., 2004). A fibre mill is a factory that produces fibres.

dyeing, printing, and so on. Depending on the level of vertical integration, a fabric mill might be specialized in finishing processes, might only produce fabrics, or might even produce its own fibres. All companies involved in this process are part of the textile industry.

After fabrics are produced in fabric mills, they can be turned into garments by the apparel or clothing industry. The textile and apparel industries are both parts of the supply chain and contribute to a garment's production and are, therefore, part of the manufacturing sector. If an apparel manufacturer can produce a very strong product and market, it on its own, it creates a manufacturer or so-called “national brand”. Canada Goose, for example, is known as a manufacturer brand, but it also retails its own products. However, because it owns its manufacturing operations, it fully controls its production and the product development process; hence, the company is also responsible for choosing the raw materials and component parts for its products. This is an important responsibility in that such a company would know all the materials used in the production process, making it easier to be transparent and implement sustainability.

Selling garments is part of the distribution channels; it includes retailers, wholesalers, and jobbers. While wholesalers buy and resell products mainly to retailers and businesses, jobbers are like wholesalers though they primarily sell ends of lines, job lots, or clearances. Retailers' main function is selling garments to consumers. Retailers connect consumers with the industry which is in charge of garment design and production (Solomon, 2013).

However, the retailer’s role changed significantly in the 1980s when they went into product development to bypass the clothing collections from manufacturer brands while trying to promote private label concepts (store brands) to offer exclusive products with higher sales margins for a lower price. This change caused a significant shift in the retail and manufacturing sectors’ structures because garments were now designed by retailers in one part of the world and produced by a manufacturer in another part of the world. As a result, manufacturers in the West lost their design and product development domination and had to compete with their

manufacturing operations against global competitors. As a response to the retailers' actions and to remain competitive, manufacturers started retail operations, closing local factories and outsourcing their manufacturing operations first nearshore and later offshore.

Until the 1980s, there was a clear differentiation between the sector responsible for selling the product and who developed and produced it. This difference, however, has diminished. Until today, the different sectors competed against each other. Consumers can often not even recognise if the company had an origin as a retailer or as a manufacturer; customers see only brand names. Further, it remains to this day that many retailers exclusively sell their private labels. On the one hand, this has led to creating several global retail powerhouses in developed countries; on the other hand, numerous manufacturers in developing countries compete against each other even by accepting low margins.

Over time even smaller retail operations started sourcing globally, looking for full-package sourcing networks. Overseas manufacturers, which initially only assembled imported products, responded by moving to a "domestically integrated and higher value-added form of exporting" full product packages (Gereffi, 1999, p. 38). To allow retailers to purchase complete package produced items, offshore manufacturers had to extend their services from solely manufacturing to sourcing all required materials such as trims, accessories, and even fabrics. In contrast, retailers gave up control over some parts of their supply chain. Therefore, a supply chain member might only know the members directly before or after its operation. For example, a retailer might not know where the fibre mill sourced their raw materials from and whether the cotton was picked by forced or child labourers. This has a significant disadvantage over a company that now wants to implement sustainability, because sustainability requires tracking from all materials and components. It requires total transparency in the garment's supply chain, but many brand owners do not know, and under, which conditions and with which materials their manufacturer compiled the product.

Usually neither small nor large retail organisations own the manufacturing sites, but large retailers have more power to determine the supply chain of their products through the specification of the raw materials and by choosing the manufacturer directly. For example, a retailer like Hennes & Mauritz (H&M) can specify the accessories or the fabric quality from a specific textile mill. While outsourcing apparel production is not restricted to retail organisations, some national brands like Levi's, for example, have also outsourced their manufacturing while opening their retail operations. This means they face the same transparency issues as retailers.

While the split of supply chains increased the complexity of different sourcing models, it also led to more diverse product development processes. Today, each garment has its unique supply chain of producers and materials. The high number of products developed every year to guarantee every week a new intake of new merchandise on the sales floor has accelerated the fashion industry's complexity.

Today a fashion company might still be a manufacturer but might also have its own wholesale and retail operations. This dissertation will not distinguish further between the different distribution channels and brands but will instead summarise them as "brand owners". Brand owners have relationships with customers; this gives them the power to decide over their supply chains. According to Gereffi (1999), this power structure operates with the fashion industry as a buyer-driven value chain, which is unlike 'producer-driven value chains' where manufacturers play the central role. The power of brand owners depends on their market share and sales volume. However, it is essential to recognize the complexity of the industry's power structure to determine where change is needed to implement sustainability.

In conclusion, since the 1980s, the fashion system has turned into a global network of suppliers, vendors, and services, all of different sizes and all operating under the enormous pressure of competition at all stages of the supply chain and distribution channels. This makes it challenging to track materials and production facilities and to implement sustainability.

4.2 Environmental and Social Impacts of the Fashion Industry

Today's fashion industry has significant environmental impacts that currently harms ecological integrity through its intensive use of energy, water, and land (Fletcher, 2008; Lavergne, 2015; Rinaldi & Testa, 2017). During the production process, the textile industry releases waste and emissions into the air, water, and land; it also uses all kinds of hazardous chemicals: pesticides, herbicides, lubricants, oils, bleach, dyes, formaldehyde, copper, and other contaminants (Fletcher, 2013b). These environmental impacts multiply with the amount of garments produced. Furthermore, the increase of the population and the living standards in countries like India and China has transformed previously low-impact people to high-impact consumers. This development causes an increase in apparel demand and enormous pressure on the Earth's ecology. However, the negative environmental impacts are only one issue of the fashion industry. Another is human labour abuse. Incidents like the tragic fire in an apparel factory in Bangladesh in 2013, which killed hundreds of textile workers, and its socio-political aftermath put the fashion industry's globalized production practices into the spotlight. Other issues include child labour on Uzbekistan's cotton fields; missing workers' rights to create unions in Cambodia; salaries under minimum wage in Bangladesh; and overall, extremely poor and unsafe working conditions. The organisation, Fashion Revolution (2019b), encourages consumers to ask the question: "Who made my clothes?" while other organisations like Greenpeace target environmental concerns and call for consumers to demand companies "detox your clothes" (i.e., the garments the companies produce) (Greenpeace, 2012). Often these demands go unmet.

The framework below (Figure 16) provides an overview of the industry's main sustainability issues and how clothing consumption drivers, such as the desire for individuality, group belonging, the political economy, and globalisation, contribute as an accelerator in all these issues. It is a system that is resistant to substantial change because it is locked by low garment prices and overconsumption of clothes expressed in low garment utilization. Therefore, it is questionable if fashion can ever be sustainable. On the other side, different sustainable fashion concepts do exist and are explored in the next section.

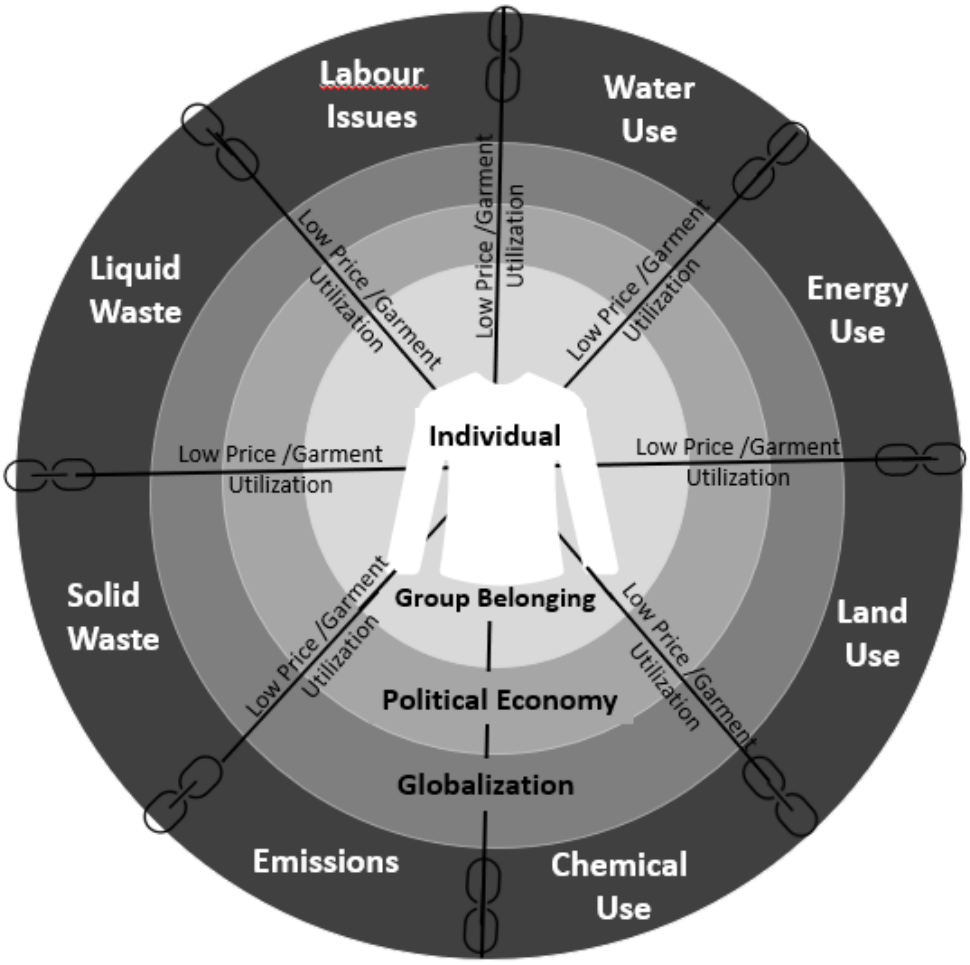

Figure 16: Sustainability issues in the fashion industry related to drivers of clothing consumption

Source: Created by the author

4.3 Sustainable Fashion Concepts

Although there is no standard definition of sustainable fashion, "sustainable fashion" is the new buzzword (Gordon & Hill, 2015, p. XV). The term is often used to describe fashion designed and produced under environmental and ethical conditions with more recent descriptions also taking the consumer into account—including how they purchase, use, and discard fashion (Fletcher, 2008; Gordon & Hill, 2015; Gwilt, 2014). In this way, sustainable fashion is different from the

types of fashion that dominate the current fashion system, particularly “fast fashion”, which is often based on labour exploitation, environmental degradation, resource depletion, and mass consumption. Sustainable fashion seeks to eradicate poverty rather than creating or adding to it. It ensures our resources are not depleted, and our environment is not destroyed or exploited (Brundtland, 1987). Sustainable fashion companies take social, environmental, and economic aspects equally into account. Since the fashion system has a strong affiliation with businesses, it is necessary to include the triple bottom line to hold companies responsible for their actions (Elkington, 1997).

About 83 percent of American adults can be considered at least some ‘shade’ of green (Ottman, 2011, p. 2), and a further 65 percent of all consumers share high social and environmental values and request the same from brands, according to Globescan research across 22 international markets (Bemporad et al., 2015). Sustainability has become trendy, and every company is or pretends to be sustainable to some degree. Therefore, it is not enough to focus on sustainable fashion alone as the sole solution to the industry’s social and environmental effects; instead, there is a need to differentiate how serious a company addresses sustainability. While investors will evaluate companies' corporate social responsibility (CSR) performance, a core difference comes from the sustainable fashion concept, including whether a company is making sustainable fashion versus a company that wants to make its fashion sustainable. Three sustainable fashion concepts have emerged: 1) slow fashion, 2) eco fashion, and 3) fashion with a conscience. The main differences in these approaches are in the commitment to embrace sustainability and the degree of innovation required to make this change happen (with slow fashion being the most radical one).

4.3.1 Slow Fashion

Slow fashion is frequently mistaken to mean simply making garments more slowly (Nakano, 2009); instead, slow fashion is about slowing down and transforming fashion consumption. Also, it does not mean that garments are designed to be basic goods or unfashionable (Fletcher, 2010).

Fletcher outlines slow fashion as the desire for fashion that follows “different values and goals” beyond any time-based concerns. It represents a “vision of sustainability” for a new fashion system as those represented by the common fashion industry (Fletcher, 2010, p. 262). Hall outlines how slow fashion involves longer production times, use of local materials, and a focus on quality and sustainability; however, at the same time, she claims, “it is more complex than simply complying with a set of slow fashion criteria” (Hall, 2018, p. 283). Slow fashion is a call to stop business models that are centred exclusively on profit and that fail to consider the socio-cultural and ecological consequences of fashion production (Hall, 2018). Establishing slow fashion requires individuals and organisations to start a social transformation. Companies need to change the design and production of products; and customers should buy less.

4.3.2 Eco-Fashion

Eco-fashion was developed in the late twentieth century as an alternative design to provide consumers with ecologically and socially sustainable choices in clothing (Pookulangara & Shephard, 2013). Similar to slow fashion, there is no unique definition of eco-fashion, but the term eco-fashion seems to be more attractive to consumers than slow fashion. Black (2015) elaborates that consumers looking for eco-fashion and join this movement are seeking “VALUE”, an acronym for Vintage, Artisan, Local, Upcycled, and Ethical. These qualities afford a large diversity in viewpoints regarding what is ethical. Per Pookulangara and Shephard, the more general concept of eco-fashion provides less direction for future business practices than does slow fashion (Pookulangara & Shephard, 2013). This ambiguity in the definition of eco-fashion also allows companies to claim that they are ‘eco’ and join the eco-movement, even though they may be ecologically sustainable in only the smallest way. For consumers, to the challenge is in identifying which companies are truly ecological. Finally, most eco-fashion companies are smaller in size with little negotiation power; hence these brands might ask consumers to pay a bit more and therefore buy less.

4.3.3 Fashion with a Conscience

Fashion with a conscience is an industry response that caters to consumers who worry about sustainability—a number that grows constantly. However, it is also a response to the fear that the industry's profits are at risk if companies continue to do business as usual (Ellen MacArthur Foundation, 2017). The fashion industry leaders who drive it are often fast fashion companies that share a vision to integrate sustainability into their business practices, for example, by promoting a circular fashion system. While it is debatable how much progress the industry has made over the last years to improve its environmental footprint and working conditions, one aspect often ignored is to change fashion cycles toward reduced consumption.

4.4 Sustainable Fashion Overview

All three of these concepts are sub-groups of "sustainable fashion", but as outlined above, the degree to which they are sustainable and how they want to become sustainable differs. While slow fashion has sustainability at its core and produces sustainable fashion, eco fashion might only have some sustainable aspects, and fashion with a conscience aims to make fashion sustainable. Therefore, only slow fashion addresses the consumption of fashion. However, most customers neither know about these concepts nor the differences between them, but typically seek "sustainable fashion" if they are aware of the industry's environmental and ethical issues. However, many consumers want sustainable fashion for the same price as fast fashion, a demand that puts pressure on the industry and allows for the same fashion consumption rate (Gardemin & Kleinhueckelkotten, 2017). But as long as fashion is constructed and treated as something disposable, fashion can never be sustainable (Ryan, 2012). To make fashion sustainable requires that brand owners change production and distribution practices, and consumers change consumption habits. One does not occur without the other. A more detailed overview of the different sustainable fashion concepts is presented in Table 3.

Table 3: Comparison of sustainable fashion concepts

Questions to ask:	Slow Fashion	Eco-Fashion	Fashion with a Conscience
Was the company founded with sustainability in mind?	The company has sustainability in its DNA, right from its foundation, or has undertaken a radical transformation committed to making sustainable fashion.	The company usually starts with one aspect of VALUE (Vintage, Artisan, Local, Upcycled, and Ethical) as its core mission.	A mainstream fashion company that started to integrate sustainability into its products and business practices, this company is in a transition; it may or may not take sustainability seriously.
Are all of the company's products sustainable?	All products are made sustainably.	Some aspects of a product may be sustainable, but a holistic sustainability approach is often missing.	Some products and business practices might be sustainable, while others are not. Some companies address the environment but miss out on the labour issues.
How does the company address labour rights?	They prefer fair trade to ensure workers are getting a living wage, not just minimum wage.	While some produce local, therefore ensuring that labour rights and minimum wages are guaranteed, others might produce offshore or nearshore. However, most Eco businesses are smaller in size and have consequently less bargaining power, mitigating the risks of mass labour	They try to make sure workers get a minimum wage.

		exploitation or sweatshops.	
How connected is the company with the supply chain?	Based on partnerships, personal connections with each supplier, there is a commitment to do business on a continuous basis.	Often these makers started an Eco business. Therefore, the supply chain is often close to the company. Sometimes they work with independent artisans and are personally connected.	There is a professional relationship but no commitment to continue business if prices rise. Workers in their supply chain are not seen as part of the company. Therefore, they accept only limited responsibility for them.
What business structure is in place?	They may be smaller or have B-Corporation certification and view their business as a force for good.	They are often smaller companies, but structure depends on the owner. Usually, they try to sell as much as possible, based on the belief that their products are a source for good.	They are committed to profit maximisation.
When will the payment be made?	There is often a commitment to help pre-finance raw materials.	Usually, suppliers are paid when they deliver the products. There might be a timeline of fourteen days for the payment.	Payment is up to90 days after receiving the goods; suppliers must pre-finance the products.
What materials are used or not used?	There is a focus on natural materials. They avoid synthetic materials (because they are mainly fossil fuel-based and do not biodegrade).	They may use PVC or PU to replace leather as a vegan alternative. They may upcycle garments or use conventional	The use of PVC, PU, and leather is common but they may no longer use exotic leathers.

	They do not use materials made of Polyvinyl Chloride (PVC), also known as "Vinyl" or Polyurethane (PU).	materials produced by artisans.	
Does the company use hazardous chemicals, for example, in the dyeing or tanning process?	The preference is to work with natural dyes and a refusal to work with hazardous chemicals.	They may or may not use hazardous chemicals. Companies are often too small to conduct expensive tests.	There is a limited voluntary commitment to not using hazardous chemicals if no social pressure or law is pushing them.
How does the company address consumption?	The focus is on the production of durable products. They strongly encourage consumers to buy less and keep garments longer.	They encourage consumers to pay a bit more for more unique pieces, and therefore buying less.	The companies business model is to sell as many garments as possible. Consumers do not need to reduce consumption. Some companies encourage their customers to donate their garments at the end of life and to consider conducting minor repairs.
What is the company's value proposition?	The company does not compete on price for their garments but on quality and durability. The company might offer other services that increase value, such as repair or return services.	They usually focus on a more narrow product line. These companies increase diversity in their product offerings because it is less mass produced, with more individualistic styles based on VALUE.	Companies offer fast fashion—conventional or partly sustainable products, mass-produced for a competitive price.

How much bargaining power has the company?	The company is built on partnerships with suppliers and based on fair negotiations; they do not use their bargaining power even if they have it.	Companies are small- or medium-sized enterprises with less than 50 - 100 employees and have minimal bargaining power.	The company has enormous bargaining power to dictate terms of delivery.
What is the Legal Ownership?	They are privately owned or B-Corporations.	They are privately owned.	They are privately owned or are multi-stakeholder corporations.

Source: Questions and potential answers were created by the author

4.5 Policy Approaches to Push the Industry towards a More Sustainable Future

While sections 3.1 and 3.2 describe how the political environment stimulates and pushes consumption, this section outlines how governments support or do not support the industry's transition towards sustainability. The global fashion industry operates mainly under the intergovernmental institution of the World Trade Organisation (WTO), which regulates and promotes free trade. In fact, with the WTO Agreement on Textiles and Clothing, quotas on imports and exports were phased out by 2005, with a target for free trade around the world by 2025 (World Trade Organization). Removing trade barriers reduce garment costs even more; hence, consumption is further stimulated. For example, currently, the import duty for clothes and footwear to Canada is between seventeen and eighteen percent, plus additional taxes. If the import duties are zero, garments prices will drop significantly.

A legislation that will help to reduce the environmental impacts from the fashion industry comes from China (Lu, 2019). The country officially accepted the circular economy as a

development strategy in 2009 (Lieder & Rashid, 2016). China strives for a nationwide implementation of a circular economy on both corporate and social levels. Likewise, the European Union is pushing towards a circular economy driven by legislation that promotes waste reduction and recycling programs. The effort European brands and retailers are making to close the loop by taking products back is no coincidence or simply voluntary; it is instead encouraged by EU's Extended Producer Responsibility legislation, which requires brand owners to be responsible for collecting, recovering, and disposing of their products (Monier et al., 2014). However, circularity does not address any social or ethical issues in the fashion industry.

An approach to combating modern slavery in supply chains was undertaken by the Parliament of the United Kingdom. In 2015, the Modern Slavery Act became a law that requires medium- to large-sized companies, businesses of £ thirty-six million turnover or more, to report on what they are doing to eradicate slavery from their supply chains (Sommerton, 2015). While the Modern Slavery Act is not a law designed particularly for the fashion industry, it remains relevant since the fashion industry is a driver of modern slavery (Fashion Revolution, 2019a).

National governments are becoming more aware of the negative impacts of the fashion industry. In October of 2018, the British Environmental Audit Committee released a letter that requested fashion retailers and brand owners provide information regarding the actions they were taking to reduce the environmental impacts of their products and operations (Creagh, 2018).

The most recent approach was announced in August 2019 by French President Macron and Kering Chairman Pinault, who unveiled, at the G7 Summit in Biarritz, a new plan to reduce the environmental impacts of the global fashion industry. How Macron aims to achieve this goal remains unclear. The fact that companies from the private sector brought forward and signed a voluntary agreement to reduce their environmental impacts is promising for future environmental efforts in large industries (Dwyer, 2019). Still, it also shows that the political will to change this industry towards sustainability is limited.

Nye Jr (2004) described fashion as a political tool of 'soft power'; namely, that countries can influence other countries without military interventions. Over the past decade, East African countries have sought to ban imports of used clothing, mostly from Western nations (News, 2016). However, the European Union—the same states that strive toward a circular economy and extended producer responsibility—uses its soft power by refusing to pay any further development help to East African countries if they implement a ban. East African countries must either accept no further development help or tonnes of textile waste from the West that are being dumped in their countries, without having a system to manage them properly. On the other side, there is a lack of soft power. For example, in Uzbekistan, the government forced nurses, teachers, and even children to work in the country's cotton fields without any interventions from other nations. Only corporate social responsibility (CSR) led to the creation of the Better Cotton Initiative. This not-for-profit organisation, which combined the negotiation power of various brand owners, put pressure on the government of Uzbekistan and achieved that at least child labour decreased significantly, rather than being the standard in the country. In contrast there was no such organisation to save the Aral Sea, on the border of Kazakhstan and Uzbekistan. The Aral Sea was the fourth largest inland lake in the world, until the government from the former Soviet Union decided to use its water for the irrigation of cotton fields. By 2005, the Aral Sea had lost more than half of its surface area and many of its ecosystem services (Bennett, 2008). In 2014, under the eyes of the United Nations Environment Program, the eastern basin of the Aral Sea completely dried up. The USA and China continue to heavily subsidy their cotton production, making it impossible for small African cotton farmers to compete. By keeping prices for cotton fibres artificially low, these nations allow for low garment prices and higher consumption.

To conclude, there are no coherent global policy approaches that require the fashion industry to transform towards sustainability. Most actions are based on voluntary codes of conduct or commitments usually signed by the same companies that are leading the sustainability field. This means that every company that pays its workers fair wages—and not minimum wages—and uses more sustainable materials and production methods will end up with fashion that costs more than fast fashion. Improving labour conditions and using lower impact

materials for sustainability increases prices. This can be risky for companies producing fast fashion which heavily rely on their garments' low pricing to compete against those that can produce cheaper. Some companies have been able to break through this low-price cycle by marketing their products as sustainable fashion, which allows them to charge higher sales prices, but sustainable fashion in the sense of slow fashion remains a niche. Only a small segment of the market wants to pay more for sustainable fashion; sustainable fashion is not attractive for most consumers. They do not want to reduce their consumption and spend more (Gardemin & Kleinhueckelkotten, 2017). Even fair trade fashion companies have found it challenging to compete and capture the middle market, since cheap, fast fashion is everywhere (Minney, 2016a).

4.6 Summary, Conclusion, and Main Findings of Chapter 4

Fast Fashion and consumers' appetite for cheap clothes come with the cost of labour and resource exploitation, and environmental degradation. Sustainable fashion responds to these unsustainable practices in this industry but can satisfy consumers only partly because sustainability increases prices on garments. However, sustainable fashion has become fashionable, so it is no longer enough to talk about sustainable fashion; it is necessary to differentiate between different sustainable fashion concepts. While slow fashion is the most radical approach, it is also the only one which strives to reduce consumption. Consumers looking for eco fashion want value, but seldom does an eco fashion company have a coherent sustainability approach. While Slow fashion creates sustainable fashion, fashion with a conscience is popular among fast fashion companies trying to make their fashion sustainable. Consumption practices must change, and to make fashion sustainable, the industry needs to stop making easily disposable clothes.

Transitioning the fashion industry towards sustainability is presently based on social responsibility and voluntary commitment from the industry itself with limited government support. Brand owners have the power to control their supply chains but struggle to change their

business models based on mass consumption. Hence, progress towards sustainability remains slow.

The fashion industry is a complex system because it consists of suppliers, vendors, and services of different sizes, including billions of consumers. All components interact and compete on all stages of the supply chain, distribution channels, the use phase of the garment, and its end-of-life management.

This chapter's key finding is a description of the stakeholders' roles, interests, and power in helping transition the industry towards sustainability. At the same time, brand owners are the most powerful group.

This chapter introduces the framework: Sustainability issues in the fashion industry related to drivers of clothing consumption. This visual is a unique approach to connecting clothing consumption drivers with the industry's different social and environmental issues.

It contributes to the sustainable fashion literature by segregating the different sustainable fashion approaches of Slow, Eco, and Fashion with a conscience and emphasises the need to integrate conscious fashion into the sustainable fashion literature.

Although countries use fashion as soft power, there is a lack of governance striving for sustainability; change relies on the industry's voluntary commitments.

Most governments and sustainable fashion companies support a circular economy approach. However, a circular economy approach does not solve the issues of unfair living wages, working in unsafe conditions, or other workers' rights.

Fashion can be sustainable if its mass-consumption can be stopped. For example, if the industry stops manufacturing disposable clothing, or if prices reflect the true costs.

CHAPTER 5: A Structural Impact Analysis of the Fashion System with regards to Textile Recycling

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5.1 Introduction

The global fashion industry is a complex system (Ellen MacArthur Foundation, 2013).[3] In this paper, the terms fashion industry and fashion system are used interchangeably. The fashion industry reflects an almost linear economy (Ellen MacArthur Foundation, 2013) whereby products are made from new materials (e.g., trees, mined substances) and discarded after a few uses, with only three percent of all unwanted textiles in the U.S. recycled into reclaimed fibres.

Complex systems change occurs when various parts of a system and the connections between these parts change and lead to a transformation of the whole system (Westley, Zimmerman and Patton, 2009). Complex systems change requires parts of a system to undergo radical innovation and a transformation of their current practices. Charles Edquist states that "[i]nnovation processes occur over time and are influenced by many factors" (Edquist, 1998, pp. 15–16). Innovation requires financial capital and personal engagement to convince the established structures to change business practices so that transformation can occur (Westley *et al.*, 2011).

[3] Westley, Zimmerman, and Patton explain that "All complex systems… share behaviour that cannot be explained by their parts" (Westley, Zimmerman, & Patton, 2009, p. 7). Therefore, the relationships between the parts of the system must be understood in their relation to one another. Complex systems are difficult to change, and there is a high uncertainty in the outcome of the system change (Westley, Zimmerman, & Patton, 2009).

The fashion system is determined by consumers and stakeholders working in the industry, as well as their relationships. The system operates under the intergovernmental institution of the World Trade Organisation (WTO) and numerous national and regional governments. The fashion system connects billions of consumers with millions of stakeholders working in the different industry sectors in multinational corporations, enterprises, start-ups, not-for-profit organisations and charities.

Transforming the fashion system requires action from consumers and various stakeholders to overcome diverse interests and perspectives. Transforming it from a linear system towards a circular one requires new technology and business practices, new skill sets, and new mindsets to develop technology that disassembles the material at the fibre level for continuous re-use.

5.1.1 Objectives

The objectives of this study are to explain the need to include textile diversion and textile recycling as part of the fashion system. If all textiles can be recycled in some way (Stall-Meadows and Goudeau, 2012), why then is textile recycling still uncommon? What needs to change to make the fashion system circular? This research analyses the structure of the fashion system to better understand why textile recycling is not a common practice. The key drivers, those with the highest influence on other factors in the system, are identified. Knowing the key drivers helps to find a starting point where change would have the highest influence on the system. This brings focus to specific actions and offers the possibility to make concrete recommendations to foster textile recycling in Canada and transform the industry towards circularity.

This paper contributes to the knowledge of textile waste diversion and textile recycling in the fashion industry by detailing structural knowledge of the fashion system. While generating data about direct influences between factors that determine the fashion system, it also contributes to quantitative research about circularity in the fashion industry. This research

conducts a structural analysis. The direct influences are evaluated, and a MICMAC (Impact Matrix Cross-Reference Multiplication Applied to a Classification) method is used to determine the indirect influences. This is a new research method to analyse the fashion system with regards to textile recycling.

5.1.2 Organisation of the Paper

The circular economy is discussed, followed by a description of the current fashion system. How clothing and fashion are consumed, and how textiles are managed at the end of their life are also points discussed. A visual overview summarises what a circular fashion system would resemble.

Next, a structural analysis of the fashion system is conducted. Based on the background information, seven selected factors determine the fashion system with regard to textile recycling. The direct influences of each factor are evaluated before a MICMAC method is used to calculate the indirect influences of the key factors. Conclusions are drawn regarding the key factors, suggesting actions to transforming the fashion system towards a circular one.

5.2 Circular Economy

A circular economy (CE) approach aims to decouple economic activities from resource use and environmental degradation by reducing waste and increasing resource efficiency in production processes (Lieder and Rashid, 2016). According to Yuan and Moriguichi, a core concept to achieving a CE is a "[closed] flow of materials and the use of raw materials and energy through multiple phases" (Yuan, Bi, & Moriguichi, 2006, p. 5) based on the three R principles of waste management: reduce, reuse, and recycle (Yuan, Bi, & Moriguichi, 2006). The first goal is to avoid waste by reducing consumption. Next, the life cycle of products is extended through reuse, repair, or repurpose. Finally, if products can no longer be used, they must be recycled to become resources.

Such a shift would be highly beneficial for any economy and environment because it requires more labour and will lead to a reduction of greenhouse gas emissions (Wijkman & Skånberg, 2015). From an industry perspective, the reduction of waste and an increase in material efficiency are worthwhile goals because they offer the potential to reduce costs for disposal of waste and the number of materials used in the production process.

When it comes to the reduction of clothing consumption, a circular economy approach is a challenge for the industry. Although clothing consumption could be reduced by expanding the lifecycle of existing garments by keeping them longer in their use phase, by repairing them when necessary, or by sharing the garment among several users (Ellen MacArthur Foundation, 2017), companies are interested in perpetuating their current business models which is fast, mass production of cheap clothing rather than the long-term use of garments. This way of operating, however, is not exclusive to the fashion industry. Stahel puts it bluntly: "Companies make money by selling high volumes of cheap and sexy goods"(Stahel, 2016, p. 436). Altering this business model would require a radical shift in the overall operations of the fashion industry.

According to the New Textiles Economy Report, released by the MacArthur Foundation, current business practices will put the profitability of the industry at risk if maintained (2017). While brands might be hesitant to change their business practices towards sustainability, this forecast indicates a clear financial loss if they continue with unsustainable business practices. The fashion industry must be transformed from a linear economy towards a circular one, but this transformation is so radical that it requires a large-scale system change. Gwen Cunningham, from Amsterdam Fashion Institute, leader of the Circle Textiles Program at Circle Economy, summarizes the problem of the industry as follows: "The 'why' of circularity is increasingly understood, but the 'how' is still largely unanswered" (Cunningham, 2017, p. n.a.). While Bédat and Shank claim that recycling will not transform the fashion industry (Bédat & Shank, 2018), it remains an essential step to achieving circularity because it allows waste to become a resource for new products.

5.3 Clothing and Fashion Consumption

North America is a consumption hub for clothing: The average American consumer purchases 1.2 garments per week, up to 64 garments per year cheaper production and has enabled the average price per garment to fall to less than USD 15 (The American Apparel & Footwear Association, 2014), a price deemed too low to pay for mending or altering.

While consumers are buying more clothes, they are also wearing garments fewer and fewer times before disposal. Some consumers even think that wearing a visibly repaired garment is a sign of poverty. To protect their image, consumers dispose of garments even if they could be repaired (Goworek et al., 2013). A 2011 study in the UK surveyed two thousand women to examine how often they wore their garments. The results indicate that the average clothing item was only worn an average of seven times before being discarded (Maybelle, 2015). Because of the desire to avoid being seen wearing a garment more than once on social media, women have adopted a 'wear it once culture', discarding clothes after only a few uses (Maybelle, 2015). Another study of British women found that one-third of participants considered clothing ‘old’ after wearing them only three times (Remy et al., 2016). Although these studies have been conducted in Europe, similar attitudes and behaviours are reported from North American consumers. The Ellen MacArthur Foundation measures the number of times a garment is worn in its “clothing utilisation”. While clothing utilisation has globally decreased, in the US, “the clothes are only worn for around a quarter of the global average” (Ellen MacArthur Foundation, 2017, p. 19).

Today, garments are cheaper than ever, and consumers are purchasing more clothes than ever before, yet they do not alter or repair them, keeping them only for a limited time and wearing them only a few times. As a result, fast fashion clothing has become ‘disposable’ or ‘throwaway’ fashion (Bhardwaj & Fairhurst, 2010). The overall increase in clothing consumption has led to even more disposal.

Council for Textile Recycling (2014) states that the North American consumer produces on average about 37.2 kg (82 lbs) of textile waste per year (Council for Textile Recycling, 2014). About 15 percent of this amount is being donated to charities for reuse; the other 85 percent end up in the waste stream (Council for Textile Recycling, 2014). Consumers believe that only garments in nearly perfect condition should be donated (Weber, 2015; Weber, Lynes, & Young, 2017). As a result, even garments with minor stains or rips will be disposed of. Unless municipalities become involved in textile waste diversion, textiles remain mainly diverted through charities' donation programs. This enormous amount of textile waste offers municipalities an opportunity to reduce and transform it into the feedstock for textile recycling operations.

5.4 Managing Textiles at End of Life

Textile recycling starts with the diversion of textiles from the waste stream. The next section provides information about waste policies in North America, followed by a section on how textiles are currently managed in North America. Although North Americans and Europeans have a similar high consumption of clothing, these two regions differ in their approaches to managing textile waste.

5.4.1 Waste Policies, Textile Waste Diversion

To divert more textiles from landfills, municipalities and cities in North America must start textile diversion programs. However, the different governance structures and laws prohibit unique provisions. In 2018, the European Union released legislation that requires all member states to set up separate collections for textile waste from households before January 1, 2025. This legislation is intended to ensure that biodegradable waste is either collected separately or recycled at source (e.g., home composting) (Cole, 2018). Similar legislation would not be possible in North America. In Canada, each province develops its own waste strategy, and decisions about

categories of waste types are managed among provincial and municipal governments, each responsible for different producer streams.

The differing governance structures for deciding what to do with waste mean that there is no 'one size fits all' solution for managing textile waste in North America. Moreover, the different geographic regions (Europe and North America) even differ in their recycling definitions.

5.4.2 Managing Textile Waste in North America

The sole methods of waste disposal in North America are landfills or incineration, but incineration is seldom used. Waste audits of landfills in the US and Canada estimate that textile waste accounts for between 5-10 percent of the total landfill (Jensen, 2012; United States Environmental Protection Agency, 2013). The percentage of textile waste in landfills depends on the existing waste diversion programs for materials other than textiles practised by municipalities. Put another way, the better the municipality diverts waste or the more recycling programs it puts into place for materials other than textiles, the higher the percentage of textile waste ends up in landfills.

Since municipalities are seldom involved in textile waste diversion, the system relies on charities. Selling used clothing is a lucrative business, and charities like Diabetes Canada, Salvation Army, Kidney Foundation, and others use those clothing donations to fundraise their missions. While selling used clothes can be a source of revenue, textile recycling is a cost, so charities ask only for clothing donations good enough for reuse. This keeps the percentage of donated clothing low and misses a great deal of clothing that needs recycling. Out of all post-consumer textile waste in North America, only 15 percent are being diverted from the waste stream. Half of the donated material (7.5 percent) is in such bad condition that it requires recycling. The other 7.5 percent are sold as second-hand garments (Council for Textile Recycling, 2014). This suggests that most consumers in North America are not aware of the opportunity of

textile recycling. Hawley concluded that "much of the discarded clothing and textile waste in the USA fails to reach the recycling pipeline" (Hawley, 2009, p. 9).

5.4.2.1 Lack of Recycling Facilities

There are very few textile recycling facilities in North America. This means that materials usually end up in landfills. Additional hurdles exist. Textile recycling, as a service, produces costs, and it is more expensive than landfilling. To foster recycling, it is necessary that laws and regulations support recycling and that markets for recycled textile products are developed to make it worthwhile to recycle the textile material.

5.4.3 Textile Recycling

Different possibilities for textile recycling exist. Unwanted garments can be used as a source for fabric or garment parts. If garments can be upcycled into new clothes, this offers an opportunity to produce new products with high value. However, there is limited knowledge and technology to upcycle garments in an industrial way. This leads to a lot of manual sorting, cutting, and remanufacturing. As a result, most upcycling operations produce one-of-a-kind products, which are difficult to duplicate in volume orders. Because of these idiosyncratic approaches, these businesses often remain in niches.

Garments can be repurposed by cutting the garment apart in a mechanical process to produce fabric parts for cleaning rags. This extension of the garment lifecycle is sometimes done by consumers to extend the use of their garments, but it is also a common practice in the textile recycling industry, often conducted in sorting facilities if they can find markets for rags. This kind of recycling is limited to garments made of cellulosic materials since synthetics are not suitable as rags.

Shredding is another mechanical recycling process. Used garments and textiles are mechanically torn apart. In this process, the fibres are broken with cardigan machines and create a shorter length of fibre material. This shredding weakens the strength of the fibre. Therefore, shredding is seen as a down-cycling process.[4] The advantage of shredding is that every fibre material can be shredded, but at the same time, an inhomogeneous fibre material is created, which is rich in short fibres but also in pieces of shred and fabrics (Gulich, 2006). Shredded material is often used as stuffing materials for upholstery or in the automobile sector, but the material is also suitable to make nonwovens and yarns (Gulich, 2006, p. 117). When natural fibres are recycled in a mechanical process, the length of the reclaimed fibres is often too short to undergo the spinning process, and must be mixed with virgin fibres to produce quality yarns (Fletcher, 2013).

Other uses of reclaimed fibres are in densified nonwovens, which are made directly from fibres without the production of yarns. Instead of being woven or knitted, nonwoven fabrics are produced with needle-punched felt techniques or thermal bonding. In the fashion industry, nonwoven fabrics are mainly used as fusing or interlinings; they are moderately stable and, therefore, not used as shell fabrics (Eberle *et al.*, 2004). The resulting reclaimed felt products are used as insulation materials, mats, blankets, or other products.

5.4.3.1 Innovation and Green Technologies

Although shredding is an established way to recycle textiles, there is a lack of shredding facilities and companies in North America. This is mainly because there are not enough end-markets for shredded materials in North America. Since products made from shredded material are often

[4] The use of the terms “down cycling” and “upcycling” accords with the SAC Recycling study. Down cycling describes an open loop process where products of minor value are generated because the product does not fully utilise the material properties of the fibre. Upcycling is a closed loop process which results in products of equal or greater value (Morley, Parker, Slater, Symington, & Waugh, 2014).

considered to be of little value, shredding is seen as a downcycling process. There is a need to find new innovative applications for shredded materials. One creative example is the company Shear composites, which uses shredded fabrics and turns them into countertops and work surfaces, flooring, and other architectural applications (Shear Composites, 2018).

To “close the loop”, used garments must be recycled into reclaimed fibres and yarns. This can be partly achieved with mechanical recycling but also with chemical recycling processes when the fabric is solved into a pulp at the macro level and then re-spun. Chemical recycling is dependent on the fibre composition of the fabric and whether it is a pure or blended material; this determines the solvent and the technology for the recycling process. Although chemical recycling is seen as the most promising recycling opportunity, there are still gaps in the knowledge about how to do it. To develop this knowledge, some fashion brands have provided grants to research institutes to develop technology for specific materials. For example, the fashion brand Hennes & Mauritz (H&M) funded the Hong Kong Research Institute of Textiles and Apparel with an estimate of 5.8 million Euros to develop technology to recycle textiles made of blended fibre material (H&M Foundation, 2017).

There are some companies, such as Victor Innovates Inc., Unifi, Inc., and Teijin K.K., which are recycling polyester and nylon materials Although these companies can produce high quality generated polyester fibres, it remains rare to see garments made of these reclaimed fibres in the market. According to the Textile Exchange’s Preferred Fibre & Materials Report 2017, “less than four million MT4, recycled polyester (which is the key fibre in preferred synthetics) makes up an estimated seven percent of polyester fibre produced — these fibres are largely used in carpets, blankets, clothing and other textile applications” (Textile Exchange, 2017, p. 29). Even though the use of recycled polyester helps to make the fashion system circular, the advantage that recycled polyester offers is that it has the same quality as polyester made of virgin materials but requires up to 30 percent less energy (Victor Group Inc, 2008). This means that recycled synthetic fibres have lower environmental impacts than fibres made from virgin materials. Although there is a lack of research comparing all textile fibres in terms of their entire life cycle assessment or

individual phases (Muthu, 2014), since fibre production has high environmental impacts in the lifecycle of a garment (Walsh and Brown, 1995), recycling of fibres is a means to significantly reducing the overall environmental impacts of clothing.

Textile recycling at the macro level is more challenging with natural fibres such as cotton or linen, or blended materials, and special fibres such as Elastane.[5] There is a lack of knowledge and technology about how to recycle these fibres at the macro level. There is, for example, a research group at Aalto University, Finland that is working on a way to recycle post-consumer textile waste. The group uses an ionic liquid — 1,5-diazabicyclo[4.3.0]non-5-ene acetate — to dissolve cellulose from wood pulp (Haslinger & Sixta, 2018). Also, the start-up company Evrnu (from Seattle) offers a suite of technologies that transform post-consumer cotton waste into a high-quality new fibre source that can be used for textile creation (Flynn, 2017). Another company working on recycled cellulosic fibres is Lenzing in Austria. In 2016, Lenzing and the Spanish Company Inditex, more commonly known by their retail brand name Zara, have announced a collaboration to transform textile waste into new fibres. Based on Lenzing's Tencel technology, they developed a new fibre called Refibra Lyocell, and began marketing it in 2017. The new material uses cotton offcuts from Zara's garment production — the scraps leftover after garment parts are cut from a fabric layer — mixed with wood pulp. Lenzing is the first manufacturer worldwide to offer manmade cellulosic fibres incorporating recycled materials on a commercial scale (Innovation in Textiles, 2016). However, by using Zara's offcuts, Lenzing eliminates the risk of unknown chemicals in the production process of the materials or any post-consumer chemicals. While this technology remains promising, it is currently limited to pre-consumer textile waste.

Recycling natural fibres at the macro level into new fibres creates reclaimed cellulosic manmade fibres. Their characteristics are like cellulosic manmade fibres, all of which can be

[5] Blended fibres are different fibres mixed into one material. Often natural and synthetic fibres are mixed to combine the attributes of different fibres and to change specific fibre characteristics or properties.

classified based on the solvent system, production process, and the cellulosic raw material used. The most common cellulosic generic manmade fibres are Viscose, Modal, Cupro, Acetate, and Lyocell (Eberle *et al.*, 2004). Although each generic fibre has different properties, all share similar characteristics with other natural (cellulosic) fibres like cotton, such as softness or moisture absorption.

In summary, textiles can be recycled in various ways, including product upcycling, downcycling, or closed-loop recycling. With mechanical and chemical recycling processes, unwanted textiles can be recycled into reclaimed fibres or yarn; the process, however, often requires virgin materials to increase fibre strength (Fletcher, 2008; Lum Kasey, 2016). The recycling of natural fibres on the macro level is not yet available on a large scale. A lack of knowledge and technical innovation remains. Although the current trends in global fibre production show that recycled synthetic materials, such as polyester or nylon, are available at scale; nevertheless, the percentage of the produced recycled synthetics compared to the overall production output of synthetics is small. This raises the question of why more textiles are not being recycled.

5.4.3.2 Infrastructure

The Material Exchange Report provides an overview of companies that produce reclaimed fibres. Out of 28 fibre/fabric suppliers that produce recycled polyester and nylon, only two suppliers are located in the United States; six suppliers have a production facility in the U.S., and 20 suppliers are outside the U.S. (Textile Exchange, 2017). This statistic shows that there are some companies working on textile recycling in the U.S., but that most companies are located outside North America. No matter where fibre mills recycle textile waste, it can be assumed that textile waste will be shipped across national borders. Since shipping waste to different countries is a political issue, this emphasises the need to connect municipalities with traders and fabric mills. Diverting textile waste from the waste stream requires an infrastructure to transport textile waste to textile recycling facilities.

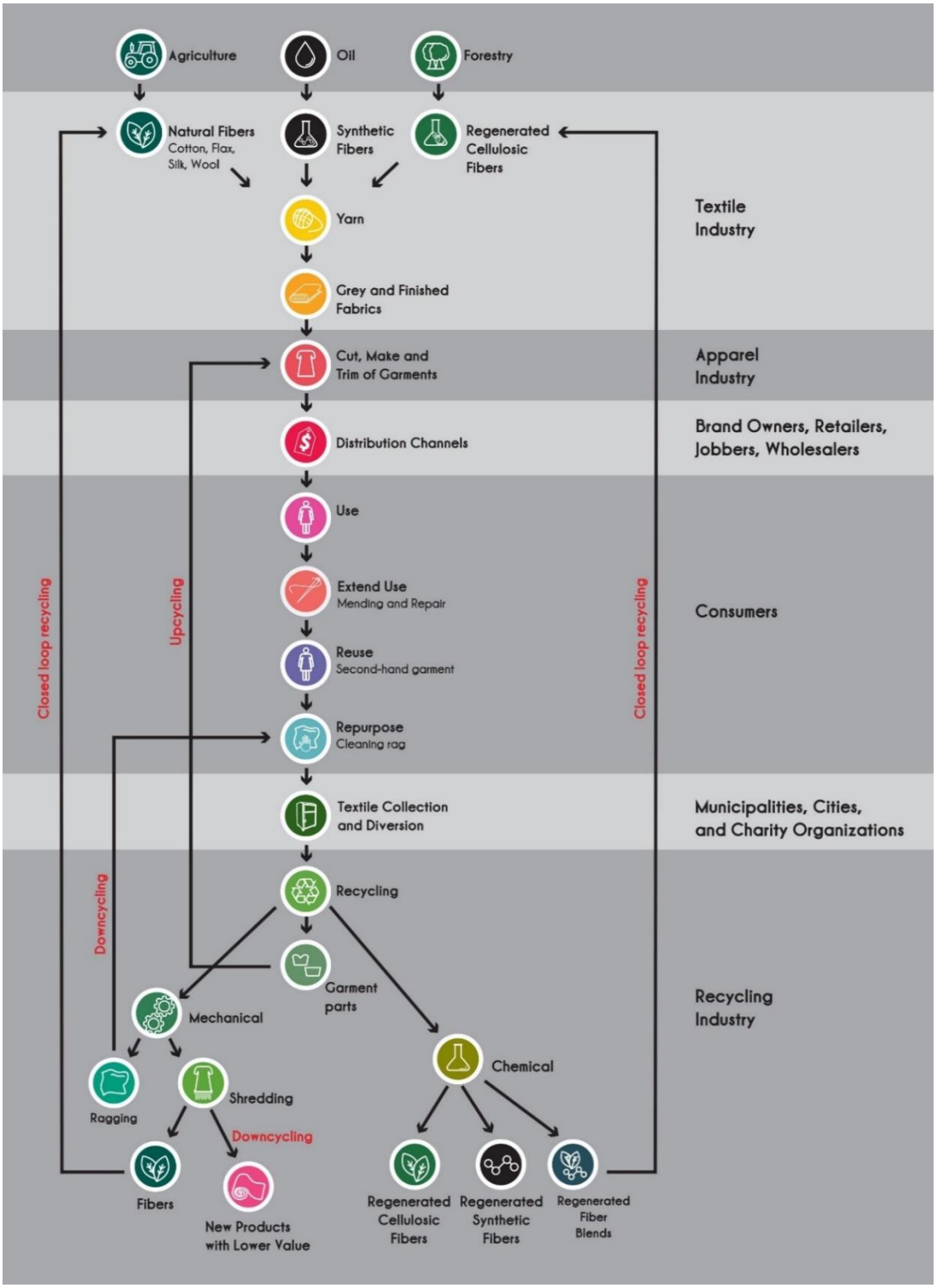

Figure 17: A Circular Fashion System

Source: Created by the author

Figure 17 shows an ideal fashion system: from the creation of a garment, its use phase and the possibilities for textile recycling. The figure also serves as a table to display the various industry sectors and stakeholders involved in the fashion system.

According to Michael Godet, systems maintain a certain permanence because of their structure (Godet, 1986). The structure of a system is dependent on the relationships of the factors. Achieving system change requires understanding the relationships of factors of the system (Godet, 1986). Formulating recommendations for specific actions to increase textile recycling requires a better understanding of the relationships between factors that keep the fashion system in its linear trajectory.

5.5 Methods

A structural analysis of the fashion system is presented to examine the structure of the relationships between factors describing the fashion system. According to Godet (1986), a structural analysis has two complementary objectives. First, the analysis creates a detailed description of the system. Second, it reduces systemic complexity to its main factors. Therefore, structural analyses can help in decision-making processes by identifying influential factors and objectives, as well as in forecasting by identifying direct and indirect influences (Godet, 1986).

The structural analysis will follow the three stages suggested by Godet. First, the factors are listed and explained, which define the fashion system and its environment. Next, in a systematic questioning procedure, the direct influences between the factors are described, and these influences are qualitatively evaluated using a 4-point Likert scale with an influence range from 0 to 3. This evaluation then leads to a structural analysis matrix. Finally, the MICMAC method is used to determine the indirect influences of these factors to identify the key influential impact factors (Godet, 1986). The structural analysis was conducted using the LIPSOR EPITA_MICMAC- Software by Godet (2010).

5.6 Analysis

Based on the description of the textile system above, the following seven factors related to textile recycling and its environment were identified and used to analyse the structure of the fashion system:

1. **Textile Diversion programs run by municipalities:** To recycle textiles, enough textile material that requires recycling must be diverted from the waste stream. This means municipalities in North America must create textile diversion programs. It is assumed that clothing consumption remains high and that enough unwanted garments can be diverted from the waste stream.
2. **Infrastructure:** Municipalities can divert textiles from landfills, but the diverted material must somehow reach fibre mills, these fibre mills might be outside the country. Connecting municipalities with fibre mills requires infrastructure and logistics, but also trade relations among the stakeholders.
3. **Fibre mills:** This study assumes that fibre mills have the know-how and technology to recycle textile waste into reclaimed fibres on a large scale and that the reclaimed fibres are comparable in quality to virgin fibres (e.g., in terms of fibre strength). As already defined, fibre mills represent the textile industry and might include vertically integrated facilities that produce yarn or fabrics. While many possibilities exist to recycle textiles, fibre mills are the preferred recycling option for unwanted textiles in achieving a circular fashion system.
4. **Markets for reclaimed fibres:** Fibre mills must be able to sell yarn and fabrics made from reclaimed fibres to apparel manufacturers and brand owners. This means brand owners must support circularity in the fashion industry. The global fashion agenda predicts that global garment production will increase by 63 percent by 2030 — based on an overall high consumption rate of clothing in North America and Europe plus expected global population growth (Watson, Miljø, Eder-Hansen, & Tärneberg, 2017). More garments require more fibres. This suggests a strong market for fibres which will positively influence the market for reclaimed fibres.

5. **Price for reclaimed fibres:** Consumers are accustomed to low garment prices. This puts pressure on prices for fibres to remain low. For reclaimed fibres to become widespread, they must be comparable in price to virgin fibres, so that the price of a garment made of reclaimed fibres is comparable to a price for a garment made of new materials.
6. **Fashion Consumers:** Fashion consumers are mainly involved in textile recycling as participants of local textile diversion programs. It is assumed that fashion consumption remains high and that consumers purchase garments and not fibres. Hence, their purchase decisions are not based on whether virgin or reclaimed material are used. It is assumed that consumers have no repercussions in purchasing garments made of recycled textiles since consumers are accustomed to recycled products.
7. **Political environment:** For the purposes of this analysis, the political environment focuses on Canadian legislation and describes government actions from the national and provincial levels. In terms of textile waste, the federal government is responsible for implementing international agreements aimed at monitoring and controlling transboundary movements of textile waste. The provincial role is to set policy for waste management. Further, it needs to be considered that the political environment also affects the operations of companies and businesses.

The following short labels for the factors are used:

1. Municipalities
2. Infrastructure
3. Fibre mills
4. Markets
5. Price
6. Consumers
7. Political environment

5.6.1 Matrix of Direct Influences

The following section models the interpretive structure of the identified factors. Therefore, the direct influences between the factors are described and evaluated. The influences range from 0 to 3: 0 = no influence, 1 = weak, 2 = moderate, and 3 = strong influence. The methodology for assigning specific values is provided in the Appendix.

The following matrix of direct influences (MDI) (see Table 4) shows all the factors and all values given for each direct influence between factors. Further, the MDI shows the sums in the rows and columns that can be interpreted as activity and passivity of the factors.

Table 4: Matrix of Direct Influences (MDI)

	1. Municipalities	2. Infrastructure	3. Fibre mills	4. Markets	5. Price	6. Consumer	7. Political Env.	**Row Sum**
1. Municipalities	0	3	2	0	1	3	1	**10**
2. Infrastructure	3	0	2	0	3	0	1	**9**
3. Fibre mills	2	2	0	2	3	0	1	**10**
4. Markets	2	2	3	0	3	0	1	**11**
5. Price	2	2	3	3	0	0	1	**11**
6. Consumer	3	0	0	1	1	0	3	**8**
7. Political Env.	2	2	1	3	3	2	0	**13**
Colum Sum	**14**	**11**	**11**	**9**	**14**	**5**	**8**	72

Source: Compiled by the author

The sums of the row scores show which factors have the strongest potentially direct influence on other factors. The strongest direct influence is the political environment (13), followed by price for reclaimed fibres (11) and markets for reclaimed fibres (11), while fibre mills (10) and municipalities (10) have less influence on other factors. Infrastructure (9) and consumers (8) have the weakest influence on other factors in the fashion system with regard to textile recycling.

Likewise, the sums of the column scores show which factors experience the strongest influence on other factors. In this case, municipalities (14) and price (14) experience the strongest influence on other factors, followed by infrastructure (11), fibre mills (11), markets (9), and the political environment (8). The lowest sum is the fashion consumer (5), meaning that the fashion consumer is the least dependent factor of all factors.

To make the direct influences and dependencies more visible, the MDI is displayed in the Map of Direct Influence/Dependency (see Figure 18). Each factor is described as a function of its impact and its dependence relative to the other factors. The impact is determined through the number of paths and loops of length arising from a factor (Godet, 1986) and its dependence relative to other factors.

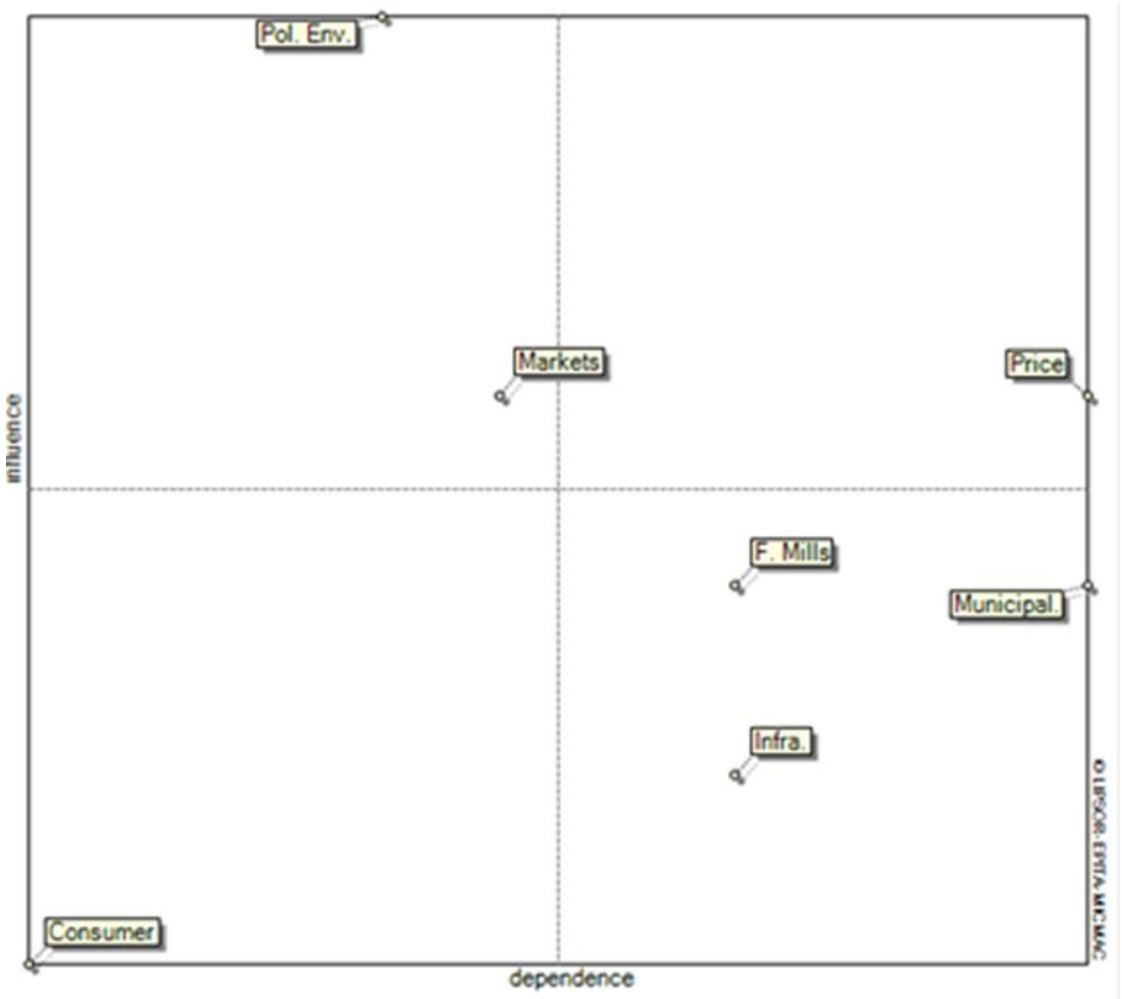

Figure 18: Map of direct influences

Source: Created by the author using LIPSOR EPITA MICMAC- Software (Godet, 2010)

The map of direct influence and dependency is divided into 4 fields (see Figure 18). In sector 1 (starting at the lower left corner and moving counter clockwise) are factors which are weak drivers. Godet names this group 'autonomous' factors (Godet, 1986). These factors have a weak direct influence on other factors. At the same time, they are weak dependent factors, with points near the origin. In the fashion recycling system, consumers are the least influenced by the other six factors.

Sector 2 shows the dependent variables. In this sector are fibre mills, infrastructure, and municipalities. All of them are weak drivers and strong dependent factors.

Municipalities in sector 2 and price in sector 3 are the most dependent factors in the system. In fact, price is a strong driver but also a strongly dependent factor.

In sector 4 are factors which are strong independent impacts. This means they have a strong influence on other factors and a weak dependency on other factors. Factors in this field are markets and the political environment. While the political environment has the strongest influence on all factors, markets that have a similar moderate influence, like price, are less dependent on other factors compared to price.

The results from the analysis of direct influences suggest that the strongest variables in the system, which have a direct influence on other variables and are therefore strong drivers, are the political environment and the markets. The political environment has a strong influence on markets and price but is dependent on consumers. Markets have a strong influence on fabric mills and price, but at the same time are dependent on price and markets. The political environment and markets influence the rest of the system, because of their strong impact and an overall weak dependency on other factors.

Price has also a strong impact with a high influence on fabric mills and markets, but is highly dependent on infrastructure, fabric mills, markets, and the political environment. This makes price a naturally unstable factor which must be studied carefully. Any action on price will have impacts on other factors and feedback effects that amplify or suppress the initial characteristic of the factor (Godet, 1986).

While the analysis of direct influences has identified the factors with the greatest direct impact on textile recycling, this does not provide any insights into the indirect influences between the factors. Analysing the hidden influences is necessary because sometimes the indirect

influences play a leading role and can significantly influence a system via indirect impacts. An analysis of the hidden influences can confirm the importance of certain factors, but also reveal other factors which were previously thought to be unimportant (Godet, 1986). Godet makes it even more clear, stating that “it would be wrong” to neglect the drivers based on indirect actions. (Godet, 1986, p. 150).

5.6.2 Matrix of Indirect Influences, MICMAC Classification

In this section, the indirect influences between factors are determined. The initial point is the Matrix of Direct Influences (MDI), then the MICMAC method is applied which uses matrix multiplication to identify influence chains and reaction loops. Godet describes: “A common matrix comprising several dozens of variables can include several million interactions in the form of chains and loops. The human mind cannot conceive and interpret such a network of relationships” (Godet, 1986, p. 147). For instance, the political environment can have an indirect influence on fibre mills by influencing price. To use the MICMAC method, matrix multiplication is conducted to study the diffusion of impacts through reaction paths and loops. It is assumed that all indirect impacts are calculated when another matrix multiplication does not influence the stability of the row and column sums. The method produces a Matrix of Indirect Influences (MII), which corresponds to the Matrix of Direct Influences (MDI) but is more powerful through successive iterations. Following this matrix, a new classification of the factors emphasizes the most important factors of the system (see Table 5).

Table 5: Matrix of Indirect Influences (MII)

	1. Municipalities	2 Infrastructure	3. Fibre Mills	4. Markets	5. Price	6. Consumer	7. Political Env.	**Row Sum**
1. Municipalities	148	196	185	130	166	108	84	1017
2. Infrastructure	200	140	158	103	206	52	110	969
3. Fibre Mills	202	178	168	134	215	72	113	1082
4. Markets	216	192	204	134	226	80	120	1172
5. Price	216	192	204	161	199	80	120	1172
6. Consumer	196	124	144	105	178	40	116	903
7. Political Env.	234	234	214	175	260	112	125	1354
Column Sum	1412	1256	1277	942	1450	544	788	7669

Source: Compiled by the author based on calculations by the LIPSOR EPITA_MICMAC- Software (Godet, 2010)

The sums of the row scores in Table 5, generated by matrix multiplications, show which factors have the strongest indirect influence on other factors. The strongest indirect influence is the political environment (1354), followed by price (1172) and markets (1172), while fibre mills (1082) and municipalities (1017) have less influence on other factors. Infrastructure (969) and consumers (903) have the weakest indirect influence on other factors with regard to textile recycling.

A comparison of the ranking of the list of factors using direct and indirect influences shows that nearly all factors kept their position. This means that factors that have strong direct influences have also strong indirect influences. Only fibre mills and municipalities have exchanged their ranking. Municipalities have a stronger direct influence while fibre mills have a stronger indirect influence.

A look at the sums of the column scores show which factors are influenced by other factors. Price (1450) is the most influenced factor in the system followed by municipalities (1412). Fibre mills (1277) and infrastructure (1256) also experience a strong indirect influence, while markets (942) and political environment (788) experience little indirect influence. Consumers experience the lowest indirect influence (544).

To make the indirect influences and dependencies more visible, they are displayed in the Map of Direct Influence/Dependency (Figure 19). Each factor is described as a function of its influence, and its dependency relative to other factors.

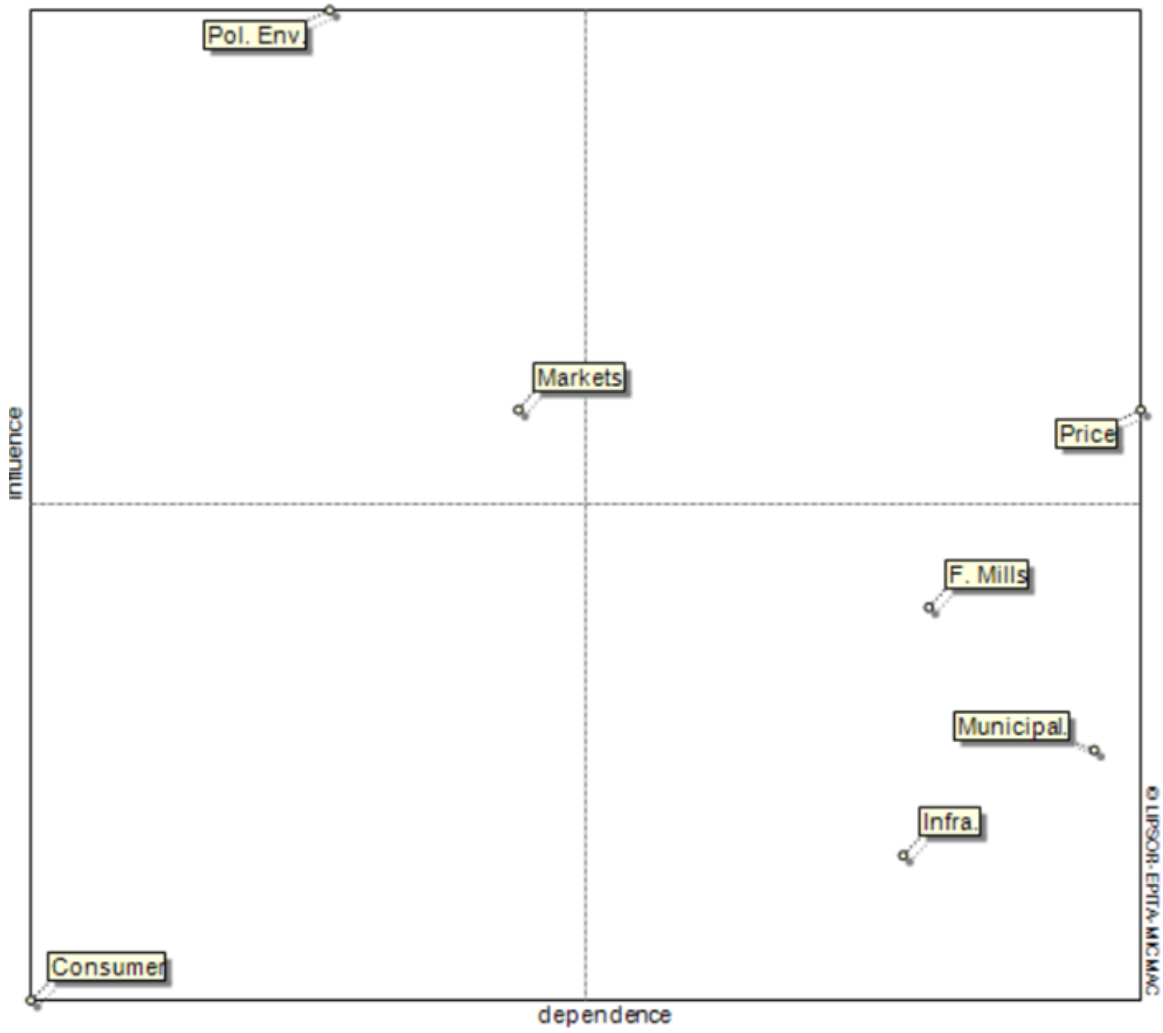

Figure 19: Map of indirect influences

Source: Created by the author using LIPSOR EPITA_MICMAC- Software (Godet, 2010)

Comparing the map of direct influences with the map of indirect influences reveals that all factors remain in the same sector with very similar positions. There is no hidden driver which has a strong indirect influence, and influences are rather direct. This result confirms the importance of the political environment and markets as leading factors of the system. Both factors have a strong direct and indirect influence on other factors and a low dependency on direct and indirect influences.

The political environment has a strong direct influence on markets (3) and price (3) and a relatively strong influence on municipalities (2), infrastructure (2), and consumers (2) (Table 4). Further, the political environment has a strong indirect influence on price (260) and a relatively strong indirect influence on municipalities (234), infrastructure (234), and fibre mills (214) (Table 5).

Markets have a strong direct influence on fibre mills (3) and price (3) and a relatively strong influence on municipalities (2) and infrastructure (2) (Table 4). Markets have a relatively strong indirect influence on price and a relatively strong indirect influence on municipalities (216), and a weak indirect influence on fibre mills (204) (Table 5).

Price is also confirmed as a strong driver with a high direct influence on fabric mills and markets. However, price remains a naturally unstable factor that is highly dependent on direct and indirect influences of fibre mills, the political environment, infrastructure, and markets. Any action on price will impact other factors with feedback effects.

Consumers keep their autonomous position; they remain weak drivers which experience the least direct and indirect influence from other factors. This is interesting because in many systems, consumers are often a key driver. It is important to remember that consumers purchase clothing and not fibres. Furthermore, a purchase decision is not made because the garment is made of reclaimed or virgin fibres, but because it suits the customer.

Infrastructure, municipalities, and fibre mills are dependent on factors such as the political environment and markets. While price is also dependent on the political environment and markets, it also has an influence on the infrastructure, municipalities, and fibre mills. This means these factors will adapt if other factors change, but do not have the power to cause change because their direct or indirect influence on other factors is too weak.

5.7 Conclusions

The structural analysis of the fashion system with a focus on textile recycling reveals the political environment and markets as the key factors of the system. Consequently, activities should focus on these two impact factors.

To move the fashion system towards circularity, governments should strengthen the markets to include reclaimed fibres. This could be achieved by demanding procurement departments prefer textile products made from reclaimed fibres (e.g., uniforms, linens). Governments could also provide brand owners with incentives to use reclaimed fibres in their products; for example, by lowering import duty for products made from reclaimed fibres. Governments in charge of waste policies could include textiles in their waste management plans to encourage municipalities to start textile diversion programs. Introducing textile diversion programs to consumers also offers the opportunity to educate consumers about textile recycling. One problem, however, seems to be that consumers are quite independent. Hence, convincing policies must be developed to integrate consumers into the system. Further, the government could encourage fibre mills to start recycling fibres with specific programs to invest in green technology.

A key factor in textile recycling is generating and cultivating markets for reclaimed fibres. This means brand owners should use as much reclaimed fibres in their products as possible. Brand owners who start to use reclaimed fibres can create supply chains that can provide them with a first mover advantage if prices for virgin materials increase due to fibre shortage. Since the use of reclaimed fibres is currently low, it is necessary to increase its use to make prices for reclaimed fibres attractive and to have enough material on stock to satisfy demand.

Furthermore, it is important that brand owners and apparel manufacturers work closely together with fibre mills to encourage them to further invest in technology for textile recycling. To make sure that unwanted textiles do not end up in the waste stream, it is necessary that brand

owners take on responsibility for textile waste, and either start with their own take-back programs or reach out to municipalities and charities. To summarize, a circular economy in the textile system depends more on public policies and markets than it does on the introduction of innovative technologies. Therefore, a promising strategy would be to influence markets through the creation of incentives and taxes like carbon pricing.

This paper has sought to contribute to the knowledge on how to achieve a circular economy in the fashion system by identifying key factors and recommending actions that increase textile recycling. This research contributes to a more elaborate model of the circular fashion system and can be used to guide strategic choices in progressing the system towards circularity. The recommended actions and identified variables can be further used for forecasting the future of the fashion industry. However, further research is needed to develop scenarios for what a possible future of the fashion system could look like if specific actions are undertaken or neglected. Since there are many possible futures, it is desirable to foster discussions among experts to clarify the systemic ramifications of actions to develop more sustainable strategies, or at least to be prepared for a global fibre gap.

5.8 Limitations of this Study

A structural analysis is a method used to structure the relationships between factors which characterise a system; it is a tool to help experts stimulate thoughts and generate ideas for action by asking questions in a structured way. There is no clear result. This means participants come up with their own conclusion. The limitations are in the list of factors chosen to describe the system and in the evaluation of values to describe the influences between factors. Both subjects are dependent on the perceived reality and knowledge by the researcher. According to Godet, 80 percent of the results obtained from the analysis confirm that initial intuition, often seen as common-sense, is logical and obvious, but that 20 percent of the results reflect ‘counter-intuitive’ results which are an essential requirement and should also receive further study (Godet, 1986, pp. 156–157). MANUSCRIPT ENDS

CHAPTER 6: A Circular Economy Approach in the Luxury Fashion Industry: Eileen Fisher Case Study

MANUSCRIPT BEGINS: Weber, S. (2019). A circular economy approach in the luxury fashion industry: A case study of Eileen Fisher. In M. A. Gardetti & S. S. Muthu (Eds.), Sustainable Luxury (pp. 127-160). Berlin, Germany: Springer

6.1 Introduction

Today's luxury fashion is presented on the catwalks and in the glossy pages of glamour magazines as dream-like visions. However, fashion has a real effect on the environment, and luxury fashion companies are increasingly cognizant of the substantial need for sustainable innovation.

One of the luxury fashion brands that has taken on a leading role in environmental justice and sustainable development is Eileen Fisher, New York (hereafter EF). The company is committed to minimising waste and to developing a sustainable, low carbon, resource efficient, and competitive business. Human rights and sustainability are part of everyday decisions and not limited to special projects or specific products.

The company launched its Green Eileen initiative in 2009, now called Eileen Fisher Renew, to offer a take-back program for used EF clothing. This unique program sorts gently used items and cleans them professionally before reselling them in Renew stores. The program is sustainable because it extends the lifespan of the textile product through further use, an entrepreneurial interpretation of extended producer responsibility since the company sells its products twice. If garments come back damaged and are not good enough to be resold under the Eileen Fisher Renew program—because they are stained, have holes, or show strong signs of use—the

company prepares them for reuse with various techniques (i.e., mending, overdyeing [overdye[6]], resewing and felting). The work, which is done in its new factory in Irvington, New York, focuses on reuse and re-manufacturing. In 2016, the factory processed about 170,000 pieces, accounting for about 2 percent of its total annual EF production.

Since there are few luxury fashion companies that follow a circular economy model, a case study approach was chosen to see and describe how the company has sought to achieve a circular economy model in the luxury fashion industry. EF represents a financially successful fashion business model committed to its values, which are: environmental sustainability, human rights, women, and girl empowerment (Director of Social Consciousness) The company became a certified B Corporation[7] in December 2015 (Eileen Fisher, 2015). EF offers a useful case study to observe the opportunities and challenges of a circular economy model. Since the examination of a circular economy requires a holistic approach, one that considers the entire lifecycle of each garment, this chapter explores multiple issues related to a circular economy (i.e., reducing, reusing, and remanufacturing or recycling).

6.2 Map of Book Chapter

This chapter first presents a literature research on the current fashion system as well as on the circular economy approaches to the fashion industry that integrate reducing, reusing, and recycling (See sections: “The Current Fashion System”; “Cultivating a Circular Economy in the Luxury Fashion Industry by Reducing Consumption”; “Challenges for a Circular Economy in the

[6] Eileen Fisher uses the term *overdye* to mean the process of redyeing garments that have already been dyed (redyeing means dyeing a second time). This process is typically done to conceal stains and other discolourations from extended use.

[7] B Corps are for-profit companies that are determined to conduct business as a source for good. The non-profit B Lab is certifying these businesses in regard to social and environmental performance, accountability, and transparency (B-Corporations).

Fashion Industry"; "Two Common Circular Business Models"). Next, it presents the results of the semi-structured interviews with employees from EF, representing different departments and operating at various functions in the company (See "Significance of this Study"; "Methods"). It will introduce the Eileen Fisher company (See "The Eileen Fisher, Inc. Enterprise"; "Profile of the Company and its Founder"). Then it shows the findings of an observational study of EF's recycling factory, with special attention paid to its operational practices (See "What Factors Contribute to or Challenge EF's Circular Economy Approach"; "Entrepreneurship and Innovation"; "An Analysis of the Operation of the take-back Program"; "Operational Steps of the EF take-back Program"). The objective of the chapter is to reflect the multiple perspectives of a circular economy approach and to collect information about this company's progression towards a circular economy. Attention is also paid to the achievements and challenges that remain (See "Next Steps"). In the context of the luxury fashion industry, there is a lack of research on the key features of a circular economy model. The goals of the chapter are to show how a circular economy model can be put into practice and to establish a guiding conceptual framework for other luxury fashion brands seeking to transform business towards a more circular economy.

6.3 The Current Fashion System

The current fashion system in North America is a linear economy predicated on buying, using, and disposing, with little diversion or reuse of unwanted textiles. In the 21st century, consumers purchase more garments than in any other period in history. According to the American Apparel and Footwear Association, the average consumer purchases 62 garments per year (The American Apparel & Footwear Association, 2012). Garments are frequently worn during the first year of purchase, but by the second year, fewer than half of the garments are still worn on a regular basis (J. Smith, 2012). A study in the Netherlands found that the average consumer gets rid of its garments after three years and five months regardless of wear (Uitdenbogerd, Brouwer, & Groot-Marcus, 1998). While the use phase for garments is short, a garment is worn an average of seven times before disposal (Maybelle, 2015). The result of this consumption and disposal is an average of 37.2 kg of textile waste per person per year in North America (Council for Textile Recycling,

2014). Textiles make up between five to ten percent of landfills in North America (Jensen, 2012; United States Environmental Protection Agency, 2013), producing carbon dioxide (CO2) and methane emissions and contributing to climate change (Fletcher, 2013b).

In North America, about 85 percent of all post-consumer textile waste ends up in landfills (Council for Textile Recycling, 2014) . These include unwanted garments and home textiles such as towels, bedding, and drapery as well as shoes and accessories. Only fifteen percent of all textiles are diverted from the waste stream through textile donations, and only three percent are recycled and reclaimed into new fibres. Four and a half percent are recycled and converted into new products such as desk counters, insulation, or stuffing materials (Council for Textile Recycling, 2014). These numbers show that the current fashion industry is based on a linear business model of buy, use, and dispose.

Why must the fashion system transition towards a circular economy? Fashion industry's current business model relies on limitless growth, but the Global Fashion Agenda describes in its policy brief, "A Call to Action for a Circular Fashion System", that the current fashion business model has reached its physical limits (Watson et al., 2017). Continuous population growth will increase global fibre consumption, leading to a global fibre gap and a continuous increase of the environmental burden. As the Global Fashion Agenda puts it, "With the world's population expected to exceed 8.5 billion people and global garment production to increase by 63 percent by 2030, this [economic] model is reaching its physical limits" (Watson et al., 2017, p. 1). Solving the compound issues of scarcity and environmental degradation requires a shift towards a new sustainable development model towards a circular economy. Therefore, a circular economy is seen as a key driver for sustainability (Bocken, 2016).

6.4 Challenges for a Circular Economy in the Fashion Industry

While definitions of the term "circular economy" vary, this chapter follows the concept offered by the industrial ecology or eco-industrial development. This approach seeks to decouple

economic growth from environmental degradation by suggesting that economic development can be achieved in harmony with the environment through waste reduction and by increasing resource efficiency. Geng and Doberstein described a circular economy as "realization of closed-loop material flow in the whole economic system" (Geng & Doberstein, 2008, p. 232), which Lieder and Rashid (2016) described as "a solution for harmonizing ambitions for economic growth and environmental protection" (p. 37). In other words, a closed-loop material flow of garment production, in which garments are endlessly reused and recycled into new products, decouples economic growth from environmental pressure. In such a system, waste is seen as a by-product of manufacturing processes and used as a resource for other industries (Geng & Doberstein, 2008). Likewise, products at their end-of-life cycle are remanufactured or recycled to become the feedstock for new products. A circular economy aims to design "an industrial economy that is restorative or regenerative by intention and design" (MacArthur, 2013, p. 15). Ghisellini et al. explain that a circular economy includes "the design of radically alternative solutions, over the entire life cycle of any process as well as at the interaction between process and the environment and the economy in which it is embedded" (Ghisellini, Cialani, & Ulgiati, 2016, p. 12). A sustainable economy will require a greater focus on solving textile waste generation and appreciating resource scarcity. While this approach might lead to the assumption that a circular economy is a waste management approach that mainly treats the symptom of waste, a circular economy approach also includes waste prevention. Indeed, most of the literature on the topic of a circular economy is based on the waste management approach of the 3Rs: reduce, reuse, and recycle (Ghisellini et al., 2016). Frequent use and long product life would optimize the value of products and could lead to a reduction of consumption. In an ideal system, materials would circulate infinitely; however, this would require a radical shift in the business operations of the fashion industry.

The common business model in the fashion industry is driven by consumption, not by reduction. The constant desire to change clothing has opened new business opportunities for fashion brands by forgoing the desire for sustained ownership and by making the idea of temporarily owning popular (Stahel, 2016). Instead of purchasing garments, consumers are

renting or borrowing clothes for a fee. Uche Okonkwo (2016) explains that the concept of 'lending' clothes has been practiced in luxury fashion for decades, namely, "when brands were 'lending' clothes and accessories to celebrities for special red carpet events like the American Oscar Awards" (Okonkwo, 2016, p. 232). Temporary ownership represents one form of performance economy, which Stahel explains "goes a step further [than a circular economy] by selling goods (or molecules) as service through rent, lease and share business models" (Stahel, 2016, p. 436). Although a promising concept, performance economy is beyond the scope of this chapter.

6.5 Cultivating a Circular Economy in the Luxury Fashion Industry by Reducing Consumption

There are multiple ways to cultivate a circular economy in the fashion industry. One that offers promise would be to reinvest in luxury fashion since the luxury fashion industry has traditionally aimed to produce clothing intended for frequent use and long product life, with garments that are durable and timeless. Phau and Prendergast outline four attributes of luxury products: brand identity, quality, exclusivity, and customer awareness (Phau & Prendergast, 2000, pp. 349,361). Instead of selling a large quantities of mass fashion, the luxury industry aims to sell fewer garments with higher retail prices, thereby reducing consumption and increasing sustainability. However, the business practices of contemporary luxury fashion companies are increasingly more in line with fast fashion than with sustainable fashion. Sull and Turconi describe fast fashion as a "retail strategy of adapting merchandise assortments to current and emerging trends as quickly and effectively as possible" (Sull & Turconi, 2008, p. 5). Most successful fashion retailers and brands operate under a fast-fashion strategy, relying on fast-changing fashion cycles and trends, and not because they are selling timeless clothing. To keep up with this fast-changing fashion cycle, some luxury fashion brands have even adopted a fast-fashion production cycle. For example, in 2016 Burberry made headlines when it announced that it would show their collections twice a year, but that collections could only be bought directly after the show based

on the concept: “buy now wear now” (Conti, 2016, p. iv). Through this rapid speed-to-market way, consumers can immediately purchase an already made product, rather than waiting the customary six months for garment delivery (Conti, 2016). According to Okonkwo (2016), the economic, social, and technological aspects of the fast fashion industry has led to profound transformations in the luxury fashion industry. While “mass fashion brands have attuned their business strategies to resemble those of luxury brands and now offer similar goods at a lower price”, changes in investment structures in the luxury sector have “increased pressure on luxury brands, for rapid sales and profitability” (226). These changes raise the question of whether luxury fashion will reduce consumption.

The features that characterize fast fashion are new merchandise each week, highly responsive and flexible supply chains, rapid speed-to-market, being highly sensitive to catwalk trends, and the perception of product scarcity (Sull & Turconi, 2008). For many years fast fashion was only associated with mass-retail chains like H&M, Zara, or Forever 21; however, luxury fashion labels are strongly influenced by fast fashion given consumer desire to follow the fashion trends. As a result, “luxury consumers now follow fashion trends religiously [based on] their desire to be always trendy and in some cases, at all costs (Okonkwo, 2016, p. 233).

Fast fashion encompasses highly fashionable clothing. Fast fashion calls for a constant replacement of garments due to new fashion trends and shifts in the fashion identity of its consumers (Smith, 2012). Because fast fashion clothes are worn only a few times (Birtwistle & Moore, 2007), this has led to the consumer habit of ‘disposable’ or ‘throwaway’ fashion (Bhardwaj & Fairhurst, 2010). Luxury fashion differs in several important respects. Luxury products stand for high quality and timeless products, but luxury products also represent innovative and creative product design and always retail at a premium price. However, under investor pressure to adopt fast-fashion production cycles to maximize profitability, luxury fashion brands have introduced mass marketing retail strategies to the luxury fashion scene, in the process creating three distinct categories of luxury fashion: “fashionable luxury”, “common luxury”, and “true luxury” (Okonkwo, 2016). Fashionable luxury refers to the fast-fashion method

of luxury fashion's dependence on ever-shortening cycles, while common luxury refers to cheaper, trendier, and more visible styles than does true luxury, which refers to timeless, durable and rare fashion. As a concept, luxury fashion does not necessarily reduce consumption. Nevertheless, it is more sustainable than fast fashion given how garments are kept and managed at the end of their life. While typical fast-fashion garments will only be kept for a short time before being thrown away, luxury fashion, and even (fast) fashionable luxury garments, will be kept because of the perceived and material value of the garment (determined by factors like brand recognition and garment price).

6.5.1 Influence of Price in a Circular Economy Luxury Fashion System

The price of a garment plays a determinative role in the duration and longevity of its use. In general, consumers keep garments longer when the investment value was high (Bye & McKinney, 2007). As Okonkwo puts it, "Consumers literally cannot afford to adopt the "throwaway fashion" attitude towards luxury goods (Okonkwo, 2016, p. 231). Further, used luxury products remain valuable due to the intrinsic value of the brand. Indeed, even in their afterlife, consumers sell their luxury clothes for substantial amounts of money (Okonkwo, 2016). Additionally, consumers might also donate or pass on their clothes to friends and family. A study from British Columbia, Canada found that the main reasons for donating textiles was to help others (37 percent), to reduce clutter (22 percent), and to find a good home for their valued goods (16 percent) (Vancity, 2016, p. 1). This consumer desire to own, keep, and responsibly manage valuable products offers opportunities for sustainable business practices.

6.6 Two Common Circular Business Models

Per Stahel (2016), there are two circular economy business models: The first promotes reuse and the extension of a product's life cycle while the other focuses on recycling unwanted materials

into new products. In both, the key to success is the people's willingness to transform the system (Stahel, 2016) with the common objective being "to maximize value at each point in a product's life" (Stahel, 2016, p. 436). The value of products can be optimised through frequent use and long product life. Products must be durable, timeless, and repairable to increase opportunities for reuse; and they must also be easy to remanufacture and recycle.

6.6.1 Reuse - Rewear

A 2015 study conducted in Ontario (Canada) by Weber, found that consumers seek to prolong the value of their products. The most common practice to get rid of unwanted garments is to donate them. Most participants, 92 percent, knew of at least one donation box site, or were aware of the opportunity to arrange a pick-up. Roughly 18 percent of the participants said that they swap their used clothing; 38 percent have tried at least once to resell a garment; and a further 12 percent have used take-back programs. In fact, take-back programs are relatively unknown in Canada. Only 31 percent of participants admitted to knowing of a retailer offering a take-back program, and 70 percent of participants though that take-back programs were a great idea (Weber, 2015b, pp. 72-73). This latter result suggests that customers are interested in the possibilities for extending the value of their clothes in ways that would benefit the wider implementation of take-back programs. Although participants had claimed that the time and effort required to resell a garment kept them from practicing it more often, second-hand shopping for clothing has become a fashion trend. A study from British Columbia (BC) confirms the growth of the second-hand economy in BC, with clothing and shoes being the most popular items of the used clothing business (Vancity, 2016).

6.6.2 Recycling

Although all textiles can be recycled in one or other way (Stall-Meadows & Goudeau, 2012), worn textiles are not commonly used as a source of raw material for new products (i.e. recycled into new fibres) in North America or even worldwide. According to the Council for Textile Recycling,

only 3 percent of the collected and diverted Textiles in North America are being recycled into new fibres, and 4.5 percent are being recycled and converted into other products (Council for Textile Recycling, 2014). There are some opportunities for ragging, usually only for garments made of natural fibres, and shredding, but those mechanical recycling opportunities mainly produce products of lower value, such as insulation and stuffing materials, and are therefore considered down-cycling. This kind of recycling can also be called an open-loop recycling process, because the new products are not remade into yarn or fabrics and are therefore not "closing the loop". Only in a closed-loop system will the material flow continue infinitely, because the recycled material becomes the source of a new fibre (this is also referred to as fibre-to-fibre recycling). If natural fibres are recycled in a mechanical process, the fibres become shorter, which requires a mixture with virgin products to produce a decent yarn quality (Fletcher, 2013b). Research into the textile recycling processes for materials at the atomic level has increased in the last few years, seeking to achieve closed-loop recycling. For example, the company Evrnu has developed a technology to dissolve natural fibres into cellulosic pulp which can then be respun into high-quality fibres. This technology is yet to be available on a larger scale.

Today, chemical processes can recycle synthetic fibres without any loss of fibre quality; and producers of recycled polyester and nylon claim that these materials require up to 30 percent less energy in their production (Koh, 2017; Victor Group.Inc, 2008). Nevertheless, the scale is small, and producers are not required to determine and explain the source of recycled material. Consumers can purchase recycled polyester, but it is unclear what percentage is recycled polyester or whether the recycled polyester is made from post-consumer textile waste or recycled plastic bottles. However, with an increased use of recycled fibres in the fashion industry, standards are becoming more important. Organisations like the Textile Exchange and the Scientific Certification Systems (SCS) provide independent third-party verification on the input materials if producers wish to have this information provided (SCS Global Services, 2014; Textile Exchange, 2017). While the SCS Certified Responsible Source™ standard evaluates products made from pre-consumer or post-consumer material diverted from the waste stream, the audit provided by the Textile Exchange for the Recycled Claim Standard and the Global Recycled

Standard require additional verification of the source of recycled materials at the recycling stage (SCS Global Services, 2014; Textile Exchange, 2017). Nevertheless, the biggest challenges in textile recycling remains in scaling the existing recycling methods and in developing recycling processes for fibre blends (Koh, 2017) and other types of material, such as spandex materials, Polyvinyl chlorate (PVC), and Polyurethane (PU). A further challenge for all chemical textile recycling processes is the unknown chemicals added to each garment (Society, 2017).

6.7 Significance of this Study

Literature on sustainability and fashion has explored opportunities and barriers against sustainability in the fashion industry and its supply chain (S. Black, 2012; Fletcher, 2013b; Henninger, Ryding, Alevizou, & Goworek, 2017; Karaosman, 2016; Moon, Lai, Lam, & Chang, 2015; Pedersen & Andersen, 2015; Pedersen & Gwozdz, 2014; Strähle, Shen, & Köksal, 2015). Few studies have focused on textile waste from a consumer's perspective and disposal behaviour regarding clothing (Birtwistle & Moore, 2007; Laitala, 2014; Lang et al., 2013), whereas some studies have explored textile recycling possibilities (JM Hawley, 2009; Zamani, Svanström, Peters, & Rydberg, 2015). Literature on a circular economy approach is often based on design possibilities in the fashion industry (McCourt & Perkins, 2015; P. Smith, Baille, & McHattie, 2017). There is less research, however, on post-retail responsibilities of brand owners to take garments back (Kant Hvass, 2014), and no research on such an approach in the luxury fashion industry. According to Hvass, post-retail responsibilities are an emerging field in the fashion industry with limited best practice studies (Kant Hvass, 2014); and only the Ellen MacArthur Foundation's report, 'A New Textiles Economy: Redesigning Fashion's Future', released in November 2017, outlines a vision for a circular fashion system, claiming that system-level change, collaboration, and innovation is necessary to make the fashion industry more sustainable (Ellen MacArthur Foundation, 2017).

6.8 Methods

The Eileen Fisher company offers a unique case to observe the opportunities and challenges of a circular economy model. Since the examination of a circular economy requires a holistic approach, multiple issues are explored related to a circular economy, such as how a company seeks to integrate reducing, reusing, and remanufacturing or recycling. In the context of the luxury fashion industry, there is a lack of research on the key features required to scale a circular economy.

A case study method was adapted from Curwen, Park, and Sarkar (2013) who used a qualitative method involving in-depth interviews and direct observation adopted from Yin (2013) to conduct a sustainability study on EF's apparel product development.

In November 2017, twelve semi-structured interviews were conducted with employees from EF, representing different departments (see section "Interview Participants"), and who operated various functions in the company. Additionally, respondents were contacted via email and telephone to review answers and provide further clarification. Their responses were analysed to outline EF's approaches to both luxury fashion and a circular economy. In-depth interviews generated rich descriptions that were analysed according to a content analysis method. Further, two EF stores and the recycling factory were visited, and additional data from the company were obtained.

For some of the participants in the study, questions were prepared ahead of time (see Appendix), while for others, questions naturally emerged during the process of the facility visit and the subsequent multi-moment assessment. Questions for the site visits were motivated by an aim to understanding the system processes related to the working steps necessary to sort, wash, deconstruct, store, remake, mend, and/or felt the garment. In short, this study sought to understand how and why EF aimed to implement a take-back program.

For the in-depth interviews, the types and topics of questions asked depended on the role and knowledge of the respondents. A qualitative codebook was generated from a review of the literature to guide the analysis. Content analysis was driven by three fundamental concerns: 1) the challenges and strengths for Eileen Fisher to become circular; 2) how 'closing the loop' affected the various departments – particularly design and retail; and3) how the take-back program was developed and how the company innovated. This codebook was used to categorize responses into distinct topics that allowed for comparison between responses.

This study explores how EF developed its take-back program and how this program led to the development of recycling operations at EF. Results were summarized in an analysis of the strengths, weakness, opportunities, and threats (SWOT) to show advantages and challenges the company faced when introducing the circular economy concept.

While visiting the recycling factory, an evaluation of its processes was conducted. The mode of inquiry was a variation of a multi-moment recording procedure, a method which assesses procedures of a particular operation occurring at a specific place over a specified duration. This method captures what work is completed and in what ways (REFA-Methodenlehre, 1978). The goal of this procedure was to compile a detailed description of the actual processing steps to discover the challenges.

EF interview participants listed by job titles:

- Director for Social Consciousness
- Manager of the Eileen Fisher Reuse Program
- Wholesale Marketing Manager
- Buyer for EF retail stores
- Designer for knitwear EF collection
- Designer for Resewn collection
- Facilitating Manager for Fabric R&D
- Sustainability Leader

- Recycling Operation Manager
- (Three) Sales Associates

Sites visited:

- EF headquarters in New York, NYC and in Irvington, NY
- “The Lab” in Irvington, NY
- EF store in New York, NYC
- EF recycling factory in Irvington, NY

6.9 Eileen Fisher, Inc.

Since its founding in 1984, Eileen Fisher, Inc. has become a USD 500 million USD enterprise which employs 1200 people. Based in Irvington, New York, Eileen Fisher sells women’s business and casual clothing as well as accessories and shoes in its stores throughout North America. Eileen Fisher garments are also offered in specialty stores and department stores in North America, while expanding its international presence to England, Dubai, Kuwait, Kazakhstan, Turkey, and Thailand. New garments typically retail USD 100 for tanks and camisoles; USD 150 for tops and tees; USD 350 for sweaters and cardigans; USD 400 for jackets and vests; USD 200 for pants; USD 180 for skirts.

6.10 Profile of the Company and Its Founder

Eileen Fisher started her career working as an interior designer in New York where she discovered Japanese aesthetics. She was fascinated by the simplicity and the timeless designs of kimonos. Feeling overwhelmed by fashion trends in the 1980s with the constant change in colors, fabrics, and shapes, she started designing clothes which she would like to wear. The result was a line of clothing that was based on simple shapes and comfortable fit, that was charming to the touch, and used a palette of timeless colours. The garments were designed to exist outside of fashion trend cycles and were easy to mix.

EF's strong vision is the driver behind the company's goal in achieving social and environmental justice. As a company, EF's sustainable approach extends to its business operations and corporate culture. Already by the early 1990s, the company recognized the need to commit and improve human rights conditions among its global supply chain partners, with their factories having to introduce international workplace standards of all their facilities. A few years later, the company extended this commitment towards sustainability with a clear obligation towards the environment. The company is motivated by a relentless push towards innovative and sustainable methodologies of design and reuse. In 2005, Eileen Fisher sold parts of the company to her employees under a staff ownership plan. With this step, Eileen Fisher wanted to ensure that the company would remain in the hands of the people and not be sold to investors only interested in the bottom line. Today, 40.5 percent of the company is owned by its employees. From its beginning, the company supported the movement of B corporations and received B-Corp certification in 2015. The B-Corp Declaration Of Interdependence says: "[Conducting business] is purpose-driven and creates benefits for all stakeholders, not just shareholders" (B-Corporations, 2017, n.a.).

EF has pioneered sustainable, true luxury fashion in the industry, and offers a productive model for how the industry might move towards a circular economy. Perhaps the most notable

aspect of EF as a luxury fashion company is its enthusiasm and determination to take back, remake, recycle, and resell their products.

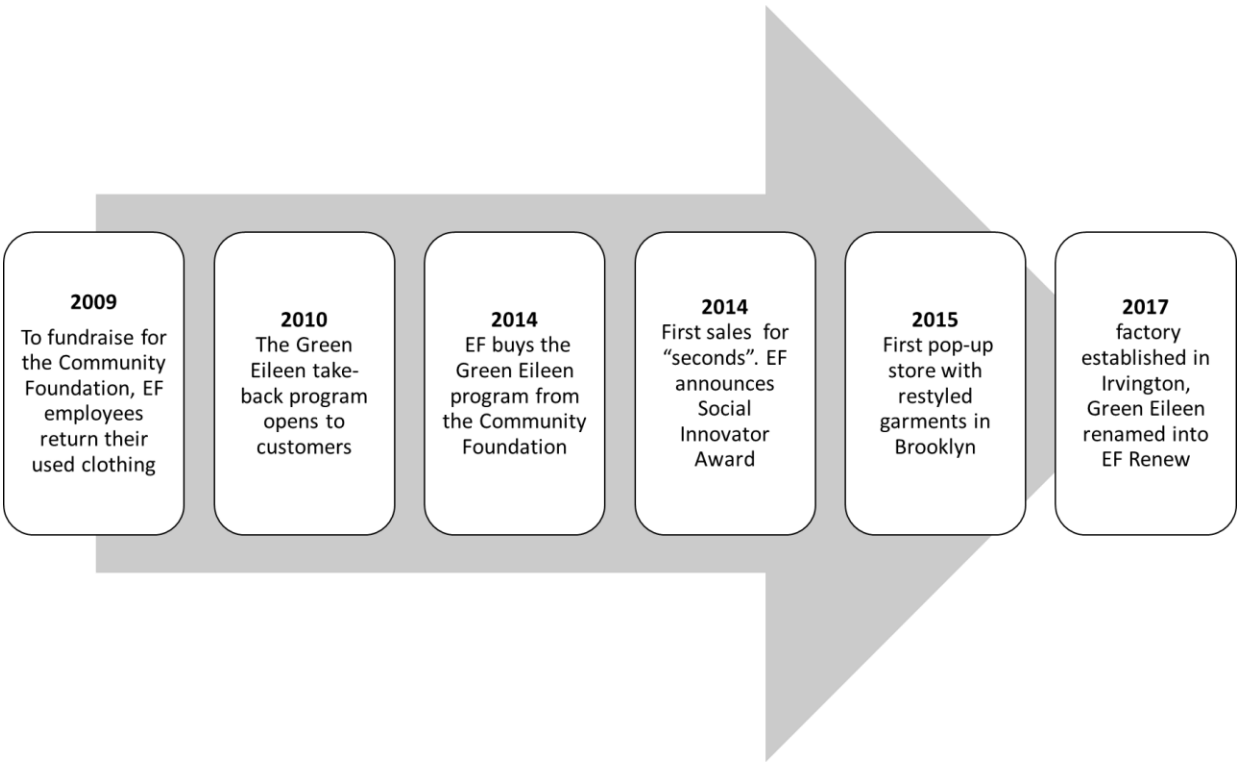

Figure 20: Milestones of Eileen Fisher's take-back program

Source: Created by the author based on information provided by EF employees

6.10.1 The Birth of EF's Take-Back Program – Collecting Garments for Reuse

Around 2008/2009, EF founded two unrelated and separate foundations: one is a private family foundation; the other, a community foundation. By definition, a community foundation has to be funded in part by the community or by other kinds of funders such as other foundations or businesses. Over the next two years, Eileen Fisher and her team held several meetings to discuss sources of income for the community foundation. One employee later recalled the tenor of the discussion as creative and exploratory: "What if we did this? What if we tried this?". An essential

question was asked: “Why not collect our beautiful clothing that we have had now for a long time and sell it? Maybe that income can provide money for the foundation.” Since the company has a very generous clothing allowance, employees had accumulated a lot of clothes in their closets. The program started with just employees bringing in their own, still in perfect condition, and dry-cleaned clothes, and selling them in the EF store in Irvington. The store manager was a big supporter of this initiative and the used clothing sold well.

Later, some of the customers expressed their interest in wanting to participate in this initiative. The funding initiative became the Green Eileen Program. After they began to accept clothing donations from customers, the program quickly grew. “When we opened it up to customers we were totally flooded with clothes,” one employee recalls, “Mountains and mountains of clothes” there. Soon there was more donated clothing than could be processed. This volume required additional storage and retail space. Although the initiative began with a rack of used clothing in the store, soon a little section of the store was apportioned for used clothing. Eventually, the program grew so successful that two standalone stores were added. At this time, all profits were going into the Community Foundation.

The accumulation of thousands of used garments led to a crisis for EF. The company donated some of the garments in good condition, or gave them to local artists working with fabrics, but most of the returned material was stocked. The surplus of material, stored for years, incurred additional costs. The manager of the Reuse Program remembers: “We didn’t have any big sellable solutions for it. We thought it was responsible to hold on to it.” Such challenging goals can be termed an organisation-wide enabling condition for innovation (Nonaka, 1994). Its certified status as a B-Corporation meant that EF was not obligated to maximize profit, which provided the potential to store those garments while determining a more viable long-term solution. EF also relied on its values rooted in sustainability and innovation to guide its solution for the stocked garments.

6.10.2 The Beginning of EF's Recycling Operations

In 2014, EF bought the Green Eileen Program from its foundation (see Figure 20). With the increase of the program, new challenges arose. Thousands of garments were donated, but not all of them could be resold in perfect quality. Many garments, so-called "seconds", were not in perfect condition but were still good enough for reuse There were also many garments which required repair and recycling. With thousands of garments accumulating in storage, the employees of the Green Eileen team started to think about recycling opportunities for the material.

Firstly, additional sales were established for "seconds". During these sales, slightly damaged used garments were sold at low price brackets: USD 15, 20, or 25. These sales attracted so many new customers, including some perhaps who would have otherwise never considered an EF garment within their budget, that they have been maintained as biannual sales events in Seattle. One employee reported: "During those sales lines of women are waiting for hours to buy a piece." According to information from EF during the last sale, it sold about USD 30,000 worth of garments in four hours, roughly 1,500 pieces in four hours, or one garment sold every 0.16 seconds. Such results can only be achieved with luxury products, which maintain a high degree of desirability, even in a "heavily used" condition. The desirability of luxury fashion, dependent on their ability for reuse, makes them the ideal material for a circular economy.

The second outcome was the Eileen Fisher Social Innovator Award. In 2014, EF partnered with The Council of Fashion Designers of America, Inc. (CFDA), a not-for-profit trade association, to implement a one-year long training and mentorship program for three post-graduate fashion designers. During the program, graduates are placed on rotation at EF and work collaboratively on sustainable design challenges. In 2014, the contestants created a 500-piece collection out of returned EF clothes. One employee stated: "We challenged them to make it sellable, to make it beautiful, to make it profitable." The collection was finally sold during a pop-up store event in Brooklyn. The project created tremendous excitement among staff and customers, and all

involved in the project were eager to continue its development. Three techniques were established as possibilities to extend the use of the textile material and to scale the program: Cut it open and sew it back together, overdye it with natural colours, or felt it. Those techniques are the base for the EF Remade collection. While the EF team had plans to start a factory even before the CFDA Social Innovator program, the program shifted EF's emphasis towards the Resewn line. Eventually, EF decided to focus all the factory's efforts on the Resewn line rather than on mending and repairing. Nevertheless, simple garment defects continue to be mended and repaired for further reuse.

Rather than adhering to a formal business plan, developments in this context were incremental, adaptive, and responsive to emergent problems in the system. Solutions were collective, innovative, and reactive.

6.10.3 The Business Case

In 2017, a factory was established next to EF headquarters in Irvington, New York to further explore and develop the repair, resew, and felting techniques. Emphasis was also placed on finding ways to make factory operations financially viable and scalable. EF established a recycling centre next to the retail store in Seattle to focus on the overdye technique. Around the same time, the "Green Eileen" program was renamed into "Eileen Fisher Renew" and the EF Lab store became the first EF store showing the full circular economy concept of the company to its customers.

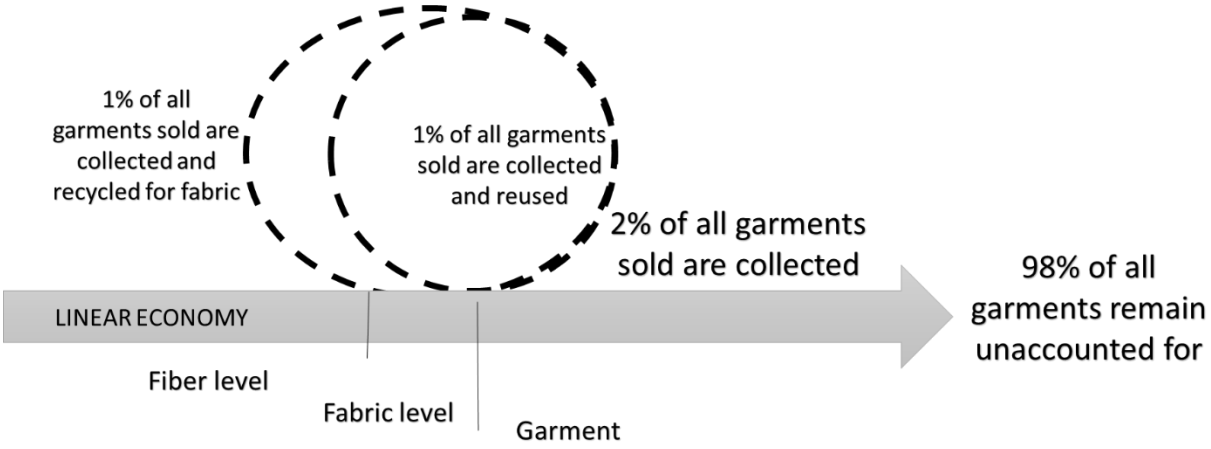

Figure 21: Scope of Eileen Fisher's take-back program

Source: Created by the author based on information provided by EF employees

In 2016, the company received about 170,000 pieces back, about 2 percent of its total annual production (see Figure 21). This translates to, on average, about 3000 garments per week arrive at the two recycling centres in Irvington and Seattle. About half of all garments taken back are in such perfect condition that they can be cleaned and resold; the other half requires recycling. To process all these garments and to coordinate all activities around the circular economy, a new department was established. Including a designer from the Social Innovator Award program, the "Renew team" consists of about forty employees across two recycling centres, two dedicated retail stores, and the factory.

6.11 What Factors Contribute to or Challenge EF's Circular Economy Approach

The interviews were analysed to determine the strengths, weaknesses, opportunities, and threats (SWOT) of EF's circular economy approach. Five key aspects were identified as central to becoming successfully circular: the concept of a true luxury product; garment design; garment manufacturing; distribution channels; and customer base. The following section discusses how

these aspects have benefited or hindered EF's approach as well as how the company has sought to address and overcome internal challenges and external threats.

1. The concept of a true luxury product: EF clothing is not about trend, but about style; garments are timeless and can still be worn years after purchase—the essence of true luxury. The products reflect the company's environmental and social responsibility values. EF garments are made of the highest fabric quality, by artisans whose technical craft makes it possible to wear the product for years. The result is beautiful, functional, and durable clothes. Products are optimised for frequent use and long product life. The buyer explains that the "[EF] customer typically likes the more timeless simple pieces that have a little bit of an edge". The retail price is high, so consumers who cannot afford a new EF garment are still keen on a second-hand piece since the brand is seen as desirable. Since garments are made of high-quality material and are durable, it is possible to use them for a very long time, and this is particularly important when the garment should be sold a second time. The luxury even extends to the reuse line: The take-back Manager claims that the garments resold are "in perfect condition. We have very high standards."

2. Garment design: EF garments are unique fashion products in that they have minimal accessories and are of a loose-fit—unique from an aesthetic standpoint, and vital for their remaking and recycling. The minimal use of accessories also decreases the risk of product damage (lost buttons, broken zippers), which increases product longevity. EF garments are comprised of wide garment panels with higher than usual yardage compared to narrow-fit clothing, so that fabric pieces are easier to remake into new garments. According to the knitwear designer of EF's main fashion line, "The more seams we put into something, the less yardage they can use if they're going to cut and resew something". The knitwear designer is conscious and sensitive to the use of seams and accessories and considers how her garments can be more easily remade. The desire for durability and longevity is encoded into every aspect of the design, starting at the sourcing of the material.

Design at EF is not limited to the garment but includes the "material development" which encompasses the fabrics and yarns. For example, it includes weave and pattern development with mills, print, and other surface design as well as yarn and stitch development. The company's vision is to use only sustainable fibres by 2020 (Fisher, 2017). This means the garment designers seek to use reclaimed fibres for their collection (e.g., reclaimed cashmere fibre) as well as recycled cotton and wool, or recycled polyester and nylon. The material development team works with suppliers to achieve high-quality materials with reclaimed fibres, natural fibres especially, until they can withstand the high requirements for an EF garment (Manager for Fabric R&D). However, there is a lack of available technology to recycle fibre blends when the material is broken down to the monomers, limiting EF's capacity to source recycled fibre material. To overcome this external challenge threatening all fashion companies, EF has joined a brand consortium called the "Circular Innovation Working Group" which has been organized by Cradle-to-Cradle Fashion Positive Institute. Therefore, EF is funding due diligence research into the viability and potential to develop and scale up synthetics (Manager for Fabric R&D). The director for Social Consciousness further explains: "We are looking outside the company for a solution to these very complex fibre challenges that we have." EF remains optimistic about future applications for sustainable design: "Each one of [the external companies] is entrepreneurial, so we are, in effect, funding external entrepreneurs to work on their own fibre technology; perhaps one of them will be the solution we're looking for, we don't know yet."

3. Manufacturing new clothing: Having full control over the supply chain can be a strength for any company because it allows for the highest level of transparency and offers the most possibilities to improve. EF outsources most of its production capacity. The director of Social Consciousness explained that it is difficult for EF to be certain about every production practice, although all manufacturers are nonetheless long-time partners. This sustained relationship provided the opportunity to collaborate towards achieving EF's values. In one instance, a production had produced huge amounts of offcuts (leftover

material that results when garments are cut into piles) in a natural colour. To keep this material from the waste stream, all fabric scraps were opened into yarn and knitted into new fabric. While this was a successful project, the company is no longer involved in how their partners manage fabric scraps or other waste. While leftover yarns and fabrics were sold at the lab store, the operation was very small and could not absorb all the leftover materials caused by the company and its partners.

Manufacturing used clothing: In addition to the lack of fibre recycling technologies available for used textiles, there is little remanufacturing knowledge for used textiles. Partly because the trend is so new, and the field is still emerging, the lack of skilled remanufacturing labourers and sites has led EF to open their own recycling facility which aims to develop and train remanufacturing knowledge and skills. While this is a huge step to becoming a circular economy, it is necessary to develop best practices to remanufacture garments. Interestingly, according to the take-back program manager, the Resewn garments "don't look remade. They just look like brand new clothes. So, in my mind, this could be something where we sell it in our stores, and you do not even make a deal out of it being remade. You just sell it." However, although the products made under the Resewn program are of high value, the remanufacturing and the repairing has not been profitable to date, in contrast with the Reuse Program which is profitable.

4. Distribution channels: EF owns 68 retail stores globally (including two Renew stores, four stores in the UK, and three stores in Canada), this provides EF with enough retail space to showcase their circular economy model, to take used garments back (only in its own retail locations within the US), and to sell reused garments. The director for Social Consciousness describes the opportunities of business expansion through the circular economy model through different price points for reused or restyled clothing: "It's … about growing business reaching out to new customers." One of the ways EF has sought to do so is by cultivating a vintage style as a means of interesting younger and less affluent customers to purchase reused EF clothing. As the director for Social Consciousness puts it: "Our price point is high, so for significantly younger people probably it is not as likely

for them to buy into it, but they would buy re-worn, remade clothing because it's popular right now. The vintage is popular." The manager of the EF Reuse Program explains that while many of EF's wholesale partners are interested in showcasing their Renew line, many operational hurdles remain. Most retail partners are not part of the take-back program, do not sell EF's reuse collection, nor do they emphasize or prioritize EF's circular economy model. To overcome this barrier, EF has implemented special sales events with their partners to communicate their circular business model and products. During one of these events, which occurred at five Nordstrom locations and online in September 2017, Nordstrom sold the main line of EF clothes along with the renewed and the remade EF clothing lines. As the wholesale marketing manager explains, "This is the first time we were able to tell the [sustainability] story in a wholesale environment."

5. Customer base: The success of the take-back program depends on the customer. EF has cultivated a relationship with its clientele who share and support the company's values. Their respect for the brand extends to respect for its clothes. In other words, the people who buy EF clothes are also the people who take care of EF clothes and who treat their garments well. These factors combine to facilitate a successful take-back program. More than 50 percent of the received garments are in perfect condition according to the manager of the EF Reuse Program. Part of this relationship can be attributed to the design ethos of the company. The EF knitwear designer explains that the luxury aspect of the brand derives from "the thoughtfulness that goes into every part of the garment, and the time we take to make sure the thing is curated in a way that's thoughtful. So, anybody that the fibre passes hands through, the factories, the workers, we want to make sure that we are putting out a product that is the best we can do, and the nicest that we can do it." While EF has a strong and loyal customer base, it is also limited to women who can afford these garments. Selling the EF remade, and especially the renewed collection, has allowed the company to extend their business and reach a new customer group. The wholesale marketing manager explains: "We did see a younger customer reacting to the story. Whether or not they bought the product is still here and there, but they definitely

> felt like the story was something that resonated with them." The marketing manager further explained that the promotion with Nordstrom, in September 2017, attracted approximately 2000 new customers in a two-week timeframe. Further, developing a luxury company towards a circular economy extended the brand recognition and its customer base.

A SWOT analysis of EF investigates how the company has addressed the circular economy approach in luxury fashion apparel. Since the company values true luxury as a business concept, quality, timelessness, and durability guide the design and manufacturing of its products. The relationship between the company and its customers plays a significant role in this business model. EF's business concept relies on the customers sharing the same values as the company. The take-back program depends on the customer to bring garments back, but also to purchase used garments or garments made of reclaimed fibres. Loyalty and trust provide the basis for this successful relationship. Challenges include global supply chains, outsourced manufacturing, and variable external sales partners, but EF has sought to address any potential issues through transparency and special projects. In the long run, however, supply chain and sales partners must be fully integrated into the circular economy business model. The main threats to becoming circular are the lack of knowledge in the textile and apparel production sector. The fibre recycling and textile remanufacturing industry remains a niche. EF has recognized this need and has taken on ownership of the textile remanufacturing challenge by developing its own facility while collaborating with others to invest in research for textile fibre recycling. While the EF program reflects a financially successful and highly innovative business model overall, there are nonetheless challenges in the daily operations in the recycling factory that suggest further opportunities for innovation.

While the SWOT analysis provides insights into the key factors which need to be considered when implementing a circular economy approach, the next section explores the company culture at EF in greater detail and considers the factors that enable the company to create and explore sustainable practices.

6.11.1 Entrepreneurship and Innovation

Under the North American Industry Classification System (NAICS), EF is listed as a manufacturer, though over the years the company outsourced most of its production to China, India, or Japan, depending on the required production techniques (e.g., batik, Shibori, or hand knitting). For example, in Peru the company follows a fair trade production model, crafting luxury fully fashioned knitwear sweaters (Curwen et al., 2013). EF has invented a manufacturing method for processing used clothing, an exceptional development in the North American fashion industry. In fact, few facilities in North America are capable of remanufacturing used clothing. Few external experts exist with a background in textile remanufacturing, and no machinery exists specifically suited for the remanufacturing processes. As a result, the whole operation is working on a "learning by doing process", developing its own best practices: generating knowledge and developing its own machinery based on this knowledge. For example, the company has developed the first felting machine for used clothing based on its knowledge of trying to felt fabric scraps and garment pieces. In so doing, EF has become an entrepreneur in textile remanufacturing.

Nonaka describes innovation as follows: "A process in which the organisation creates and defines problems and then actively develops new knowledge to solve them" (Nonaka, 1994, p. 14). How did the company actively develop new knowledge? The Director for Social Consciousness explains: "The company has somehow managed to get this far being very creative all these years and somewhat innovative, without a formal way … without any kind of formal innovation process or system." Though EF abides by no formal innovation procedures, its innovation comes from its company culture. Employees at EF claimed they felt included and empowered to participate in the company's progress; they felt invited to share their ideas, make suggestions, and think about challenges they experience during their work and outside the company. Per Quinn (1987), one of the main barriers to innovation is the bureaucratic barrier when top managers operate in isolation with little contact with employees and customers. By contrast, innovation occurs "when top executives appreciate innovation and manage their

company's value system and atmosphere to support it" (Quinn, 1987, p. 77). In one instance, the manager of the Reuse Program remembered: "There was a woman … from the store. She was obsessed about what we were going to do with these damaged goods, so she would do a lot of research, and she found some machine that would felt fabric." According to Quinn, experts and fanatics are often pioneers in problem-solving (Quinn, 1987). Innovation in this case came from an employee rather than a manager, a bottom-up approach to innovation, in which innovation is suffused in the foundations of the company culture. According to Westley, employee enthusiasm is dependent on their capacity to communicate with their managers (Westley, 1990). The better the communication, the more energetic and empowered the employee. More importantly, "The ability of any organisation to be cohesive depends on the structure and quality of its communication system" (Westley, 1990, p. 337). Communication creates a positive, optimistic energy in the company itself, and it provides employees the possibility to innovate.

6.12 Analysis of the Operation of the Take-Back Program

The recycling factory was visited and analysed according to a variation on a multi-moment observation method to clarify EF's take-back and recycling program at the operational level. The following grid describes each working process of the take-back and recycling process, as well as risks and actions taken. Analyzing the operational level of the EF take-back program details the many steps involved in a take-back program. The aims are to identify key issues and factors which need to be addressed at multiple levels to improve the existing program, and to determine how manufacturers can lay the foundations for adopting their own take-back programs

Table 6: Operational steps of the EF take-back program

Department: Retail Store				
Job	**Challenge**	**Action**	**Effect**	**Risk/Considerations**
Take back clothes from customers	Will customers bring used clothes back?	Customer receives voucher when returning a garment; USD 5 per garment regardless of condition.	Consumers receive non-expiring gift cards; this might lead to the accumulating of gift cards.	Accruing debt with customer credit.
	Where to put/store the returned clothes?	Space in the store is limited, but each EF store has a "systems wall", with some space behind the wall to store material.	Space is further limited by the volume of other material, but regular pick-up has so far avoided major problems.	There might be a risk of seasonal peak for garment donations in fall and at Easter.
	Will the return of used clothing require too much time from sales associates?	So far, this problem has not occurred. Usually, customers bring products back but also want to look in the store for something new.	No effect.	Long processing wait times might deter customers from returning garments or from being assisted in new sales.
	How to ensure used garments do not get in contact with new garments (risking contamination)?	When a customer brings used clothes, they will be put in a plastic bag if they are not already in one. Employees seal the bag.	Additional environmental burden from countless plastic bags.	Might consider reusable bags right from the beginning.
	How to organize the clothing return to the warehouse?	Once the store has compiled a few bins, clothes in their plastic bags will be returned to the warehouse when new shipments arrive.	Additional transportation and handling costs; each store defines when it has enough material to send.	Additional costs and CO2 emissions; stores might have different perceptions of when they have enough material for return.

	How will retail partners participate in the take-back program?	External partners are excluded; garments are only taken back in EF stores.	The program is limited.	Customers who might not be aware that the take-back program is only offered in EF store, might seek out a retail partner and be rebuffed.
	What will be done if customers return products not from EF?	If this is recognized in the store, those garments will be refused.	Additional sorting criteria.	Customer might be offended.
Department: Circular Economy Team Operational Process Facility – Mending area, Recycling Centre, and Warehouse in Irvington				
Job	**Challenge**	**Action**	**Effect**	**Risk/Considerations**
Garments arrive in their plastic bags and are brought into the facility in bins.	How many garments will arrive? Will the number be about the same all year?	The facility began the sorting operation in 2010, the recycling operation in July 2017. There is limited data available for the number of garments arriving per year, per month, per week, and whether the numbers will remain similar in the next years. EF is developing better tracking of weekly incoming and outgoing.	There might be seasonal peaks in garment donations.	Seasonal peaks may require flexible space and labour force. Risk is recognized by EF in their efforts to achieve more accurate tracking.
	Can all the garments which arrive be processed/sorted?	About 2000 garments can be processed per week if more clothes arrive in between required storage; if not enough material donated the labour will be short of work if there is no additional	Garments might pile up and occupy additional space. Without sufficient inventory on stock, employees might have no work.	Even if insufficient material is returned, the facility still needs to be operated, which produces costs. If too much material cannot be processed, additional

		overflow material to process.		space is required, which also produces additional costs.
Bags are opened, garments are taken out and sorted by material, by season, by saleability, and by brand (non-EF garments will be donated).	What is the condition of the returned garments?	The more garments which are not good enough for reuse, the more material needs recycling.	Handling capacity in the recycling section might vary. Garments might remain in the facility over a long period.	Garments of differing quality lead to variable income and increased recycling costs.
	How can marks and defects be determined in the fastest way with minimal oversight?	Each garment is inspected by a trained employee and its condition determined, which is very labour intensive. Defects are not marked since garment will be washed.	The process is time-consuming and labour intensive.	High costs; and might lead to back-up of returned products, requiring additional sorting.
Off-season garments will not be washed but stored as inventory in colour-coded bags, sorted by product groups.	Will there be enough storage space for off-season garments?	The interim storage requires an additional process.	Additional costs for space and labour but it is unclear how much value the garments have.	Since the material is not washed, insects could damage the garments and reduce the value.
In-season garments are laundered in-house or from contractor to clean and remove stains.	Which stains will be removed with the washing process?	Currently no policy in place regarding stains; however, special stain treatments might achieve better results and increase product value. Currently, no data document how much stains will disappear after laundry.	It is questionable if stains can be removed after laundry since the EF customer takes care of her clothes and has probably washed and dry-cleaned them before.	More information and data are required about the stains.
	How much time and handling are necessary for the laundry process? What are the costs?	A fixed laundry process is critical in a smooth operation process. Due to the operation time of each	The process flow is not guaranteed, the volume of garments requiring laundering will vary.	Time and capacity analysis needs to be done to organize the laundry process.

		stage of the washing program, if garments require additional treatment, they will incur additional handling costs.		
Some in-season garments will be dry cleaned if the material or garment is to be resold. Dry cleaning is typically more expensive than laundering and has higher environmental costs. If the garment requires recycling, it will be washed.	Is the dry clean necessary?	Sorting garments for resale to be dry cleaned.	Garments might not be resold.	Criteria for garments requiring dry cleaning must be set, especially if there is no longer a care label affixed to the garment.
Returned garments will require another sorting process. The condition of every garment will need to be determined.	How to define the level of use for a garment?	Workers must be trained to understand the required level of perfection.	The level of perfection requires standards.	Guidelines and standards have to be developed.
	Will the inspection accurately determine whether a garment is in perfect condition or if it is a “second”? How is damage determined?	Since there is only one inspection, there is nothing else which can be done, except adding another inspection before delivery.	Adding another inspection requires time and increases costs.	Since another inspection might be too costly, stores require information for what to do in case they receive a damaged garment.
	Does the garment still have its labels?	Labels might need to be replaced but require product knowledge.	Risk of adding incorrect labels.	Might lead to false care from consumer or disappointment.
Garments with little defects will be mended.	How can the mending be done so that the garment becomes a sellable product?	Repairing the garment with the best possible mending technique.	Some garments will turn out well and sell, others are mended but not sellable.	Important to connect with sales and find out what kind of mending produces sellable

				garments. Ex., should the mending thread be dyed to match or contrast? Develop standards.
Damaged garments (with little/big holes) will be processed in the maker space.	How obvious is the damage? How can the defect be made visible?	If the damage is not obvious, the next sorting process must search again for the damage.	Little defects might require additional time in the sorting process.	Spending too much time in sorting; consider marking the defects.
Garments in perfect condition and "seconds" will be separated and will be stored in the "warehouse section".	How long will these garments be stored in the warehouse before they can be delivered to a store?	Stores request used clothing or pick it up themselves depending on their proximity to storage facility.	The longer garments are stored, the greater the costs. Stores might be sent material that the clientele of that particular store do not seek.	Additional storage time increases the risk of damage to garments. Ex., some garments might lose shape if hanging too long.
	What is on stock in the warehouse? How to know what is available?	Currently, products are organized by product groups, size, colour. The system is visually sorted by humans without an online system using product numbers.	Since the warehouse is organized, an employee with retail experience can select pieces manually.	Deliverable clothing volumes remain to be calculated. The wrong material might be sent to stores that does not sell, requiring the product to be reprocessed.
Deliveries for stores with perfect garments will be put together for shipment.	What kind of products should be chosen for resale?	Garments are put together and are waiting for next delivery to store—referred to as 'picking'.	Since the warehouse is organized, an employee with retail experience can select pieces manually. This includes the risk of picking the wrong garments for sales. Who is responsible for putting the deliveries together?	What are the criteria: Ex., will the garments be picked by season? Is it better to have the same style in a few sizes? Relying on skilled pickers might create a bottleneck in distribution.
"Seconds" are sold during warehouse sales a few times per	How long will the seconds be stored before they can be sold?	Organizing and Logistic of bringing the "Seconds" to Seattle.	Additional time for handling and costs for transport.	Although seconds sell well, there might not be enough revenue due to

year, currently only in Seattle location.	How much space will they require?			the costs of handling, transport, and storage.
Department: Circular Economy Team Operational Process Facility – Sorting area, Recycling Centre, and Warehouse in Irvington				
Job	**Challenge**	**Action**	**Effect**	**Risk/Considerations**
Garments with stains and holes arrive at the sorting space and are organized by the fabric content (or fabric groups, because in some categories there is very little material), style, color, and occasionally size. The material groups are put together in batches, come in bags, and are stored.	Will there be enough similar material with matching colors?	Insufficient matching material requires additional searching for new material, further complicating the process.	Different piles require additional space and time for sorting. Additional costs for plastic bags for pre-sorted materials	The various piles might become disorganized.
	At which place of the garment is the hole or stain; can the standard pattern be applied?	Finding the right pattern or searching for additional material.	Search for a pattern and additional material requires additional time.	Without a workflow, the process cannot scale into an industrial production.
If designated for Resewn, the garment is deconstructed (seams are opened, each single garment piece is cut and sewn together).	How can the seams be opened, the pieces cut and sewn together in the fastest way while still producing an attractive garment?	Currently, there is not enough labour, so the work is done well but not in an industrial way.	Little output and high costs.	Without a workflow, the process cannot scale into an industrial production.
Labelling and storage of resewn garments.	For which season are those garments made? How do they blend in the store with the new deliveries?	75,000 pieces are held in clear plastic bags on stock.	Although EF has a large stockpile, they currently produce a small volume of resewn garments, limiting their distribution to every store. Stores might not get	The produced garments might be too expensive and not financially viable. If not, enough garments are delivered, sales are limited.

			enough material, limiting visibility for the resewn concept.	
Department: Circular Economy Team Operational Process Facility – Felting area, Recycling Centre in Irvington				
Job	**Challenge**	**Action**	**Effect**	**Risk/Considerations**
Deconstructed garment pieces are felted together; tests with fabric scraps are being conducted.	How can the pieces be felted together in the fastest and most beautiful way?	A trained designer puts the layers together and prepares the textile for felting. The process takes a long time.	If a highly trained person is doing this, job costs remain high, and the existing two machines will not be used to full capacity.	Not enough output; costly machinery. Consider training of workers with lower education.

Source: Created by the author through observations and interviews at EF

6.13 Next Steps

The results of the multi-moment analysis show that although EF has established a successful and functional take-back program, many issues remain to be addressed at an operational level. However, most of EF's challenges could be improved with a few main actions presented in this next section. These steps could be taken proactively by any company seeking to integrate circular economy principles into its business.

6.13.1 Barcode Technology

The most time-intensive aspect of the process is the time it takes to manually sort the returned garments. Barcode technology containing metadata optimized for sorting, such as garment size, shape, colour, fabric, and production year, would optimize the processing logistics, allowing inventory to be collected, sorted, managed, and transported. This embedded data offers opportunities for innovative companies to develop sophisticated barcode technology, which could either be proprietary for each company, or industry-wide, better facilitating any future take-back programs.

6.13.2 Defining Reusability Standards and Criteria

While mending is generally preferable to recycling, because the garment is kept longer at a higher level of use, this process is only practical when the garment can be sold for reuse after the mending. Therefore, criteria must be developed to guide whether and how a garment should be mended. Clear guidelines for the sorting criteria of the received materials are also needed.

6.13.3 Making the Recycling Program Financially Viable

Scaling the recycling initiative increases costs. While the reselling of the used garments is a great source for revenue and is promising due to an overall growth rate of the second-hand market, the main challenge in the future might be to collect more used garments good enough for reuse. A helpful strategy could be to convince partners to expand the EF take-back program to retail partners and specialty stores. Further, this emphasises the need to have the take-back program financially independent from the Reuse Program. Therefore, recycling operations must be optimised and scaled appropriately for the company to at least break even.

6.13.4 Measuring the Environmental Success

Since EF is driven to realize a circular economy approach and to reduce its environmental footprint, it is important to assess the environmental impacts of its take-back program. A circular business model is based on reducing, reusing, and recycling; and each of these goals, according to Bocken et al. (2016), can be examined according to their slowing, narrowing, and closing effects on the environmental impact. The main effect of EF's take-back program is to extend the life cycle of the garments – which slows consumption and resource need, but it is unclear to what degree this reduces consumption. The narrowing effect, which is based on manufacturing efficiencies, can be applied in various ways (e.g., in the production process of the new garment). The line has an environmental impact because it requires energy and is, therefore, an increase in environmental burden. The current process for each garment involves washing and cleaning upon arrival at the recycling facility, but often consumers have washed their garments before donating. Skipping this process might provide opportunities to reduce environmental impacts. To determine the effect of the washing and dry cleaning operation, including the transportation between the various facilities, an environmental assessment is needed.

The felting operation comes closest to closing the loop because the process produces a new fabric. Closing the loop would entail the making of a new fibre from the recycled garments

(fibre to fibre recycling). However, felting also requires energy and new machinery. It prevents material from going into the waste stream, which is a clear environmental benefit, but it also entails environmental costs. The Resewn line represents a new manufacturing process, the environmental effects of which remain to be assessed.

6.14 Conclusion

EF is an industry leader in its circular economy approach to luxury fashion apparel. While it faces daily challenges at the operational level, EF's approach to a circular economy business model has changed the entire EF enterprise. Fundamental changes in one area of the business have led to a profound restructuring in operations of the whole company. Per Amit and Zott, new business models often affect the entire enterprise (Amit & Zott, 2001). EF's circular economy approach led the company to innovate in all five types of innovation described by Schumpeter (1982): First, EF developed new products such as pillows and purses made of felted materials; second, EF developed new production methods such as the overdying of silk garments with natural dyes; third, the sourcing team sought new suppliers for reclaimed fibres and eventually exchanged fibres like Rayon with Tencel, which can be produced in a closed loop; fourth, EF reorganized the business to incorporate a take-back program in the development of its circular store, the Lab and forthcoming Brooklyn store. Finally, EF gained new customers and access to new markets by offering EF clothing at discounted (though nonetheless profitable) prices. Going forward, the company should seek to expand the program to all partners in the supply chain and retail channels.

A circular economy approach aims to increase economic growth without environmental degradation. For EF, a circular economy approach has increased business through unique products aimed at loyal and new customers, requiring a limited number of additional resources. The EF Renew program has expanded the product line of EF with affordable luxury garments for the mass market and with new felted products for the luxury consumer. However, the full environmental benefit remains unclear. While the company collects about 170,000 garments per

year, this represents only two percent of the total garments sold each year by the company. Even EF's business model remains linear until scaled. Moreover, collecting and diverting the material from the landfill is not a net saving for the environment, since new operations require energy and produce waste. Therefore, further environmental assessment is necessary. The biggest opportunity in this new business model to extend the business without increasing resource scarcity and environmental degradation has been achieved, but further research is necessary to assess and evaluate the environmental benefits. Some strategic decisions could also help to make the program more efficient and more financially viable, such as new barcode technology, the development of standards and criteria to evaluate the received material, better production planning, and manufacturing processes.

A sustainable circular fashion economy requires socially conscious companies led by strong entrepreneurship that are invested in innovation at every level of the company structure. To develop a circular fashion economy, companies must strive to integrate several aspects under a sustainable approach: the business model, the product, the design, the manufacturing, the customer base, and the retail operations.

MANUSCRIPT ENDS

CHAPTER 7: Social Innovation in Fashion

Social innovation theories have been applied to fields like healthcare, education, environmental management, social sciences, and others. Still, little research has considered social innovation and fashion, and there is even less research that explored social innovation as a tool to achieve broader systems change in the fashion industry. For instance, a Scopus database search for the keywords fashion or textiles or clothes and social innovation in the heading, abstract, or as keywords found only 15 studies that were published between 2010 and 2020. The papers were reviewed, and most studies miss connecting the proposed cases with social innovation theory to determine if the described case meets the requirements for social innovation.

This chapter presents a literature review to describe social innovation's key characteristics. Next, it offers an assessment tool that defines the requirements in identifying social innovation cases. Then, to better characterise and analyse a social innovation case and its capacity to shift the system towards sustainability, I introduce social innovation terminology, namely, the concepts of Social and System Entrepreneurship and Cross-Scale Dynamics.

Finally, I describe the case of a sustainable fashion entrepreneur, Safia Minney, and her company, People Tree, and apply the assessment tool to determine whether social innovation exists in the fashion system and consider its transformative potential.

7.1 Social Innovation

As its name implies, social innovation addresses complex social problems and often starts by recognizing a need and then developing an idea to address it (Mulgan, 2006). While some scholars argue that all innovations have a social dimension because all innovations require social participation and impact people's lives in some way (Nicholls & Murdock, 2012), social innovation aims to increase human wellbeing directly and is increasingly used to address sustainability challenges (Repo & Matschoss, 2020).

Antadze and Westley (2012) provided a more comprehensive definition of social innovation that considers the broader systems in which change occurs. They described social innovation as “a complex process that produces new programs, processes, platforms, or products that profoundly change the basic routines, resources and authority flow or beliefs of the social system” in which it is introduced (Antadze & Westley, 2012, p. 133). The definition as a “process” emphasizes that a series of different actions are required to achieve a particular goal. Hence, it is less likely that one single action will lead to the desired outcome, instead multiple changes are required. Per Nicholls and Murdock (2012, p. 4) “systems-level change demands a variety of types and levels of—often interrelated—innovation across time”.

Successful social innovations have transformative impacts (Avelino et al., 2019). Avelino et al. (2019, p. 196) defined transformative as irreversible, a “persistent adjustment in social values, outlooks and behaviours”. A transformative impact on a system describes the change, alteration or replacement of a currently undesirable system with a new one. Walker et al. defined transformation in a social-ecological system (SES) as “[t]he capacity to create a fundamentally new system when ecological, economic, or social (including political) conditions make the existing system untenable” (Walker et al., 2004, p. 5).

Social innovation can be transformative because it addresses the system's fundamental problems (Westley et al., 2013) and ultimately shifts the power structure to change the system that created the problem in the first place (Westley, 2017). Social innovation is more than introducing innovations with some benefits for societal niches; it can transform the broader social system. However, if the root of the problem is not addressed, the underlying patterns keep a system on its current trajectory and system change cannot be achieved (Westley, Zimmerman, & Patton, 2009). Therefore, the scope of the effort required to change an entire system makes it unlikely that one person or organisation can do it alone. Social innovation requires a variety of actors who are committed to changing the system and who work collectively or separately on the root of the problem (Westley & Antadze, 2010).

Transformation requires collaboration, partnerships, and the creation of networks. Social innovation caters to social needs and creates "new social relationships or collaborations, that are both good for society and enhance society's capacity to act" (Mulgan, 2006, p. 35) by creating "new practices …, methods, processes and regulations" (Butzin et al., 2014, p. 11). Put another way, social innovation is a process of collective learning through social relations such as collaborations and conflict. The members of a particular joint group learn, invent and lay out new rules for the common goal (Crozier & Friedberg, 1993). Group members learn new social practices in the collective learning process and acquire the necessary cognitive, rational, and organisational skills (Crozier & Friedberg, 1993). This description emphasizes the collective learning process as the source for new ideas which can change or disrupt a system. Nicholls and Murdock (2012) further claimed that an innovation needs not only be new, it can also be a renewal of a pre-existing process.

Even if a system is transformed, however, it does not mean the achieved changes will be permanent or stable. As Westley and Antadze (2010) pointed out, successful social innovation is not only transformative, but also requires *durability* and *scale*. The *scale* describes the impact of the innovation; *durability* means an innovation moves across scales and transforms the legal, economic, and political regime of a system (Westley, Antadze, Riddell, Robinson, & Geobey, 2014). Moore et al. differentiated between large scale change in social innovation, which involves "changes to rules, resource flows, cultural beliefs and relationships in a social system" and large-scale change in social enterprises or social entrepreneurship, which describes "the diffusion or replication of a programme, product, or organisational model in multiple geographic locations and contexts" (Moore, Riddell, & Vocisano, 2015, p. 71). Hence, scale in social innovation means more than increasing the number of people that demand the innovation; it means scaling the transformative impact—a more complex and diverse process than just increasing demand (Moore et al., 2015).

Consequently, high-impact change in social innovation "demands innovation across multiple scales" (Westley et al., 2011, p. 767), a concept described by Walker et al. as panarchies

(2009). Therefore, a high-impact change occurs when a transformed system is scaled. Depending on its dynamics and pathways, an innovation can involve several levels of scaling. Westley et al. differentiate between '*scaling out*' and '*scaling up*' (Westley et al., 2014, p. 237). *Scaling out* uses replication and diffusion to impact more people and reach larger geographic areas; *scaling up* targets all people who need the social innovation by addressing the larger institutional roots of a problem (Westley et al., 2014, p. 237). Scaling up, therefore, implies changing institutions through policies, rules, and laws. Moore et al. add another path to increase scale: 'scaling deep' (Moore et al., 2015, p. 74). Scaling deep is based on the idea that durable change requires transforming people's values, cultural practices, and relationships (Moore et al., 2015). While changing a person's values and cultural milieu is complicated, achieving this change has a high impact on effectiveness because many decisions are determined by culture and beliefs.

To summarize, there are different requirements and criteria that define a social innovation.

- Firstly, regarding the social innovation itself: a) It must address a complex problem and seek to change or disrupt the system that caused the problem; b) it must increase human well-being or address an environmental problem; c) it requires novelty; and d) a product, process, or platform with a transformative impact is created.
- Secondly, for an innovation to achieve durability, it must be implemented across multiple scales. This means innovation must reach a larger group of people (scaling out), but it also requires change in policies, rules, and laws (scaling-up) as well as a change in people's values and culture (scaling deep). The highest impact of an innovation is achieved when it is scaled up, wide, and deep.

Table 7 provides an overview of all the requirements that must be met to make a social innovation. The table can be used to assess whether an innovation meets the criteria of social innovation and identify areas where innovations lack scale, durability, and transformative impact of the broader system.

Table 7: Assessment tool for the requirements of social innovation

Requirements that must be met	**Yes/No**
The innovation addresses a complex system (Antadze & Westley, 2012).	
The innovation addresses social or environmental problems to directly increase human wellbeing (Nicholls & Murdock, 2012).	
The innovation creates programs, processes, platforms, products, or systems (Antadze & Westley, 2012).	
The innovation has a transformative impact. It profoundly changes the basic routines, resources, and authority flow or beliefs of the social system (Westley et al., 2013).	
Scale: At least one of the following requirements must be met	
Innovation is scaled out. Scaling out means replicating and diffusing the innovation to impact more people and reach larger geographic areas (Westley et al., 2014).	
Innovation is scaled up. Scaling up implies changing institutions through policies, rules, and laws (Westley et al., 2014).	
Innovation is scaled deep. Scaling deep transforms people's values, cultural practices, and relationships (Moore et al., 2015).	
Innovation has high durability (desirable, but not a requirement)	
Innovation encompasses multiple scales: out, up, deep (Westley et al., 2014).	

Source: The individual sources are provided after each condition

7.1.1 Agency in Social Innovation

The previous section outlined what social innovation is and the criteria for successful social innovation; however, every social innovation comes with a story and agencies that spark the creation of a new product, process, or platform. Actors use agency at an individual or organisational level and leverage network interactions to change the system (Olsen, 2017).

Individual agents can play a crucial role in enabling system change (Westley et al., 2013). In the literature, the individuals who initiate social innovations are referred to by various terms. For example, Gilmour, Walkerden, and Scandol (1999) called them 'champions', Crawford, Kasmidi, Korompis, and Pollnac (2006) used the term 'change agents', and Butzin and Terstriep (2018) called them 'actors'. I adopt the term 'social innovator' from Westley et al. (2009).

Butzin and Terstriep (2018) further outlined that social innovation initiatives require different skill sets; these require various actors and networks in different roles and functions. These actors can be a developer, promoter, supporter, or knowledge provider. Hence, social innovators can collaborate on social innovation to access the required skillsets. Therefore, social innovations can include different individuals, organisations, or institutions. Another reason why social innovations often need team effort or significant personal engagement is that these agencies are operating with limited resources (Terstriep, Kleverbeck, Deserti, & Rizzo, 2015). Hence, they must possess various characteristics, values, and skillsets or be able to access these skills from multiple sources. Such skills include creativity, willingness to collaborate, ability to create relationships and networks, a talent for improvisation to overcome the resource gap, and knowledge about the subject. In other words, they must be 'all-rounders', or be so driven by their goal that they can activate resources they never thought they could possess (Westley et al., 2009).

McGowan, Westley, and Tjoernbo (2017) describe actors who create a social innovation idea as social entrepreneurs. This means that in addition to identifying a social problem and its root causes, they recognize an opportunity to develop a solution to this problem to establish a new, stable system that improves the life of the targeted group. If resources are needed to secure and scale a social innovation, which is often the case, the social entrepreneur can turn into an *institutional entrepreneur*—also known as a *system entrepreneur*. The social entrepreneur and the institutional entrepreneur may be the same person but may also be different people operating at different phases of the innovation (McGowan et al., 2017). Butzin and Terstriep (2018) noted that there is no clear boundary between the roles of entrepreneurs and that one

person can have more than one role. Maguire, Hardy, and Lawrence (2004) claimed that institutional entrepreneurs are concerned about the institutionalization of the innovations and try to implement these new practices, processes, or platforms by connecting them with the routines and values of different stakeholders in the system to scale the innovation. Hence, institutional/system entrepreneurs play a significant role in scaling social innovation.

Going forward, I use the term *social innovato*r as a general term for people or agencies that have created a social innovation. Suppose the social innovator is working on systems change. In that case, I use the term systems entrepreneur (rather than *institutional entrepreneurs*); and I use the term *social entrepreneur* when there is a market or business orientation to the innovation.

7.1.1.1 The Role of the Social Innovator

Social innovators have different roles and functions in the social innovation process (Butzin & Terstriep, 2018). Based on the literature, I have identified two prominent roles around which all activities are clustered. The first one is, initializing the social innovation process; the second is, creating the condition for the innovation to grow (see Figure 22).

The multiple cases described in the book *Getting to Maybe (Westley et al., 2009)* reveal how the individual social innovator is a driving force that initiates a social innovation process. Part of a social innovator's role in initializing the social innovation process is to receive a *call-to-action*. The *call-to-action* often comes from an individual's strong emotional reaction to an incident or event. Per Westley et al. (2009), it can start out of despair, frustration, feeling overwhelmed, or when enough people reach a personal tipping point. Social innovators can experience this call after something momentous happens. They have the feeling they can no longer tolerate the situation, so must do something; at the same time, they recognize an opportunity and have an idea of how to intervene to help the targeted group (Westley et al., 2009). Sometimes it can take years from the time a social innovator has identified a dilemma

before taking action. However, once a social innovator has understood how the system works, why and what causes the problems in the first place, and has an idea of how to change it, they might initialize a social innovation process. Once a social innovation is invented, the innovator's role is to create the condition for the innovation to grow.

A social innovator should not be imagined as a superhero, but rather as a person trying to navigate the challenge (Westley et al., 2009) by creating the conditions for social innovation to grow. Also, not every person who feels a call to action will start a process of social innovation. Various activities are necessary to put the idea of social innovation into practice and to create and implement an innovation to establish a new system over time that improves the life of the targeted group. Once the innovation has transformed the old system and a new system is created, it needs durability, and the innovation must be scaled (out, up, and deep).

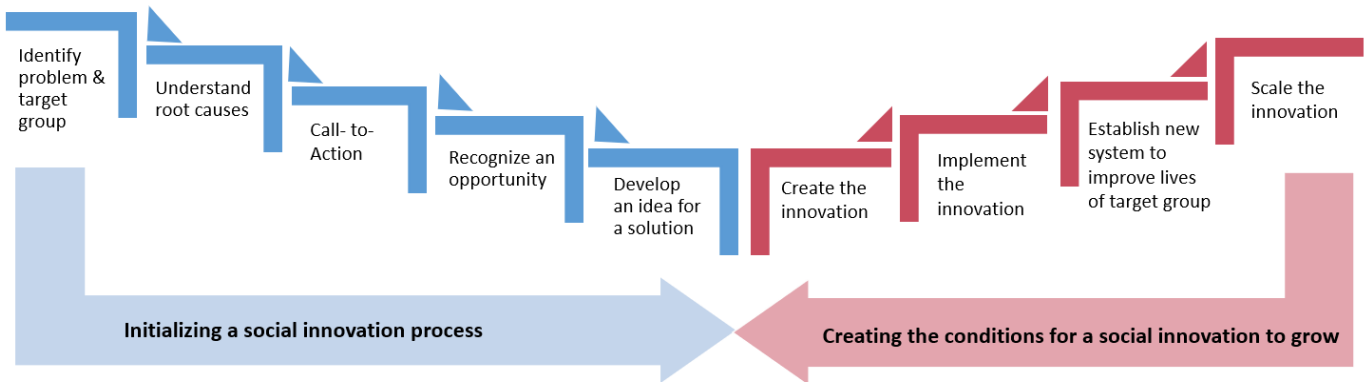

Figure 22: Role of the innovator in the social innovation process

Source: Compiled by the author based on the book Getting to Maybe (Westley et al., 2009)

7.1.2 Cross-Scale Dynamics

Once a social innovation case is identified, its durability and scale must be evaluated. The assessment tool (see Table 7) provides a framework if the innovation is scaled (out, up, or deep), but its purpose is not to clarify how the different scales interact, or to evaluate the various stages of a complex transition process. As McGowan et al. (2017, p. 10) pointed out, there remains a

need for a framework that "visualize[s] the unfolding of social innovation over time." I use the Multi-Level Perspective (MLP) framework by Geels (2002) to show cross-scale dynamics (scaling innovations across multiple scales) in the fashion industry, which are essential to understanding transitions of scale better, thereby recognizing which actors and actions can directly lead to systems change (see Figure 2 and Figure 23). This knowledge can then be used to develop strategies in how to support actors and foster systems change. Geels and Schot (2010) described transitions as a multi-level process, as nested hierarchies consisting of niches, regimes, and landscapes. The micro-scale of individual interactions are niches that require a lot of work from their innovators because they are unstable and have limited structures that face much uncertainty (Geels & Schot, 2010). On the other hand, niches operate in a safe space and have the freedom to invent and create. Niches are outside the mainstream market. Geels and Schot (2010, p. 22) described niches as "incubation rooms" that create and protect novelty. For example, a niche in sustainable fashion is Preloved, a Canadian company/brand that upcycles unique pieces with vintage and deadstock materials and sells its products exclusively online (Preloved, 2021).

Regimes are more stable than niches; the networks are larger and more structured. In this hierarchy level, rules and regulations are articulated. Regimes involve legal and policy institutions, industries, markets, organisations, or communities, or as Moore puts it: "regimes involve … how we organize ourselves as humans – in communities, in organisations, and in governance processes" (Moore, 2017, p. 219). Geels further outlines: "The rules of socio-technical regimes account for the stability and locking of socio-technical systems" (Geels & Schot, 2010, p. 20). This means companies and organisations are often resistant to transformative change because they are tight in contracts with buyers or suppliers, or must stick to specific technical standards embedded in the regime level (Tushman & Romanelli, 1985). The company Joe Fresh is a typical fast-fashion company that reflects the mainstream fashion industry and is part of the regime.

Finally, the landscape involves the broader social, cultural, economic, and political environment (Moore, 2017) and cannot be influenced directly by the regime or the niche actors (Geels & Schot, 2010). Part of the fashion landscape is the market system which is based on privately-owned companies striving for profit maximization to accumulate capital. The market is highly competitive and price-driven. Geels and Schot (2010) argued that the transition comes from the interactions between the processes at different hierarchy levels; when there is a window of opportunity, and the landscape creates pressure on existing regimes, then niche innovations have a chance. This theory emphasizes that despite networks and novel innovations, niches can only solve the problems of regimes if regimes become unstable due to pressure from landscapes; otherwise, a system remains stuck in its conditions. Figure 23 shows the multiple levels of a system consisting of niches, regimes, and landscapes. It shows how niches can develop a patchwork of regimes that can further scale and form a new landscape. Next to the framework is a description of the different hierarchies applied to the fashion system.

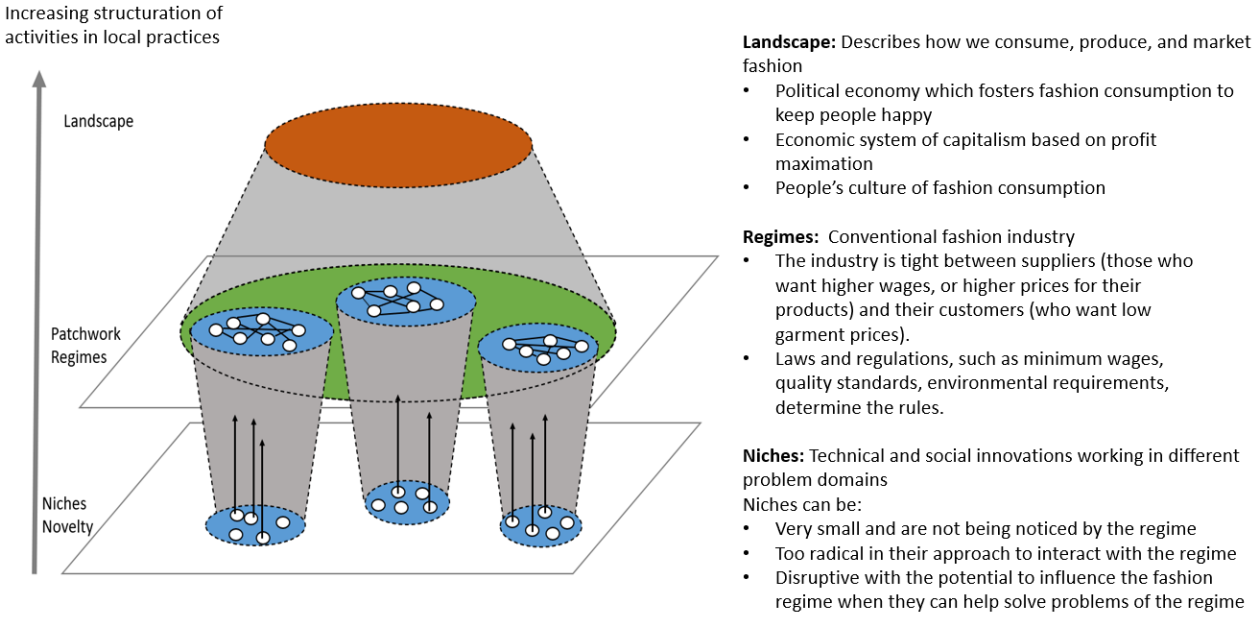

Figure 23: Multiple levels as a nested hierarchy (Geels, 2002) applied to the fashion industry by the author

7.2 Social Innovation in the Fashion Industry

While social innovation is increasingly used to address sustainability (Repo & Matschoss, 2020), it is also suited to change complex systems by implementing new processes and products that systematically transform the system (Antadze & Westley, 2012). Since the fashion industry is a complex system (see Chapter 4), social innovation can theoretically occur. However, the industry's resistance to transformative change would suggest that it lacks social innovation, or that the social innovations that have been implemented remain at the niche level without scale, or that the innovation did not target or achieve sustainability; otherwise, why is the industry still unsustainable?

I present a potential social innovation case which I evaluate with the social innovation assessment tool to answer the research question of whether social innovation exists in the fashion industry. Further, I analyse the cross-scale dynamics of this case to understand its transformative impact. Since social innovation can be a lengthy process that takes years to address intractable problem domains and create lasting change (Westley, 2017), I looked for an innovation case that has existed for many years. I selected Safia Minney, founder of the social enterprise People Tree, a privately-owned business established in 1991 that was the first to create and market its own fair trade fashion collection (Minney, 2016a). While Minney is undoubtedly a successful social entrepreneur, I wanted to find out if she is also a systems entrepreneur who can change the broader fashion system by mobilizing resources.

7.2.1 Approach to the Study

I developed a semi-structured interview protocol with questions based on cases of social innovators described in the book *Getting to Maybe (see Appendix D).* The interview's primary focus was to get more background information and to complement my literature review. The Safia Minney's whole life story can be found in Appendix E; however, the main points of her story are summarized in this chapter.

7.2.2 Safia Minney and People Tree

From an early age, Safia Minney recognized the unfair pattern in fashion production and decided that she would not support it. When she could not find any sustainable clothes while living in Japan, she started her company *People Tree*. Its business strategy placed sustainable fashion at its core: garments renowned for their fashionability—with many artistic details, such as hand embroidery and traditional Japanese Shibori dyes, for their sustainability.

While other sustainable fashion companies often lack the fashion aspect, People Tree has proven different. A standout highlight was when People Tree brought sustainable fashion to the cover of *Vogue* magazine, showing that sustainable fashion can be stylish. Also successful was the cooperation with model and actress Emma Watson to produce and connect with a younger audience with fair trade clothing (Milligan, 2010). Today, fashion from People Tree can be purchased in more than 200 physical stores around Europe and from stores online.

Minney introduced fair trade practices by creating unique supply chains based on partnerships rather than on the lowest purchasing price. People Tree's business practice contrasts with most other fashion companies that do not treat the workers in their supply chain as employees they must be responsible for, thus allowing for their exploitation. While fair trade has been around since the 1950s, the introduction of fair trade to fashion is somewhat novel. In 2014, the company was the first fashion company to receive the label of certified fair trade in its entire supply chain from the World Fair Trade Organisation (WFTO). Through her work and her company, Minney pays hundreds of workers a living wage and demonstrates that sustainability in the fashion industry is possible.[8]

[8] Fair trade does not pay living wages, but minimum wages with a premium amount for community projects.

To achieve her goal of sustainable fashion, Minney introduced innovations to cotton production that made organic cotton available for fashion products as an alternative and more sustainable fibre option. She engaged with farmers to share best practices on revitalising and preparing organic agricultural land. Her dream was to produce organic cotton in Bangladesh and India, but she doubted if it would ever be possible (Minney, 2016a). Today, India accounts for 51% of the global organic cotton supply and is the largest producer of organic cotton, with 23,251 hectares (Barsley et al., 2021). A lot of this success goes back to Minney's work, helping farmers to convert their land.

People Tree has demonstrated that it is possible to produce sustainable fashion and that the fashion system can be transformed when the ethical roots of the problems are addressed (labour exploitation and environmental degradation). While many people would be satisfied with this success, Minney has sought to address the issues on a larger scale. She has started working as a consultant to help mainstream fashion companies include organic cotton and scale-out organic cotton production.

Safia Minney believes that governments are responsible for holding businesses accountable, and that governments should follow the UK's lead by signing the Modern Slavery Act. She is an advocate who lobbies for and supports this act in the UK and globally. The act requires that each company, medium- to large-sized, with businesses of thirty-six million British pounds turnover or more, be legally obligated to report on what they are doing to eradicate slavery from their supply chains. Minney wants to change the mainstream fashion industry by putting pressure on governments. She is keen to scale up labour rights and change laws and regulations.

Further, she asks that consumers promote slow fashion, focusing on reduced fashion consumption and fair wages for garment and textile workers (see Section 4.3.1). Her social innovations to connect with consumers include videos, films and, published books that explain how to put sustainability in fashion into practice. While she crowdfunded her book Slave to

Fashion, she used it to demonstrate on the one hand how millions of workers are caught up in slavery, while on the other hand, to share best practices of brands and designers to improve the situation for garment workers (Minney, 2016a). With an appearance in the documentary *True Cost*, she reached millions of consumers and encouraged them to change consumption patterns.

Applying the assessment tool presented at the start of this chapter to Minney's case shows that all requirements for social innovation are fulfilled. Hence, I can conclude that social innovation exists in the fashion industry. While Safia Minney has successfully scaled out her innovation, she is still working to scale it up and deep. The table shows that her innovations are not scaled on all levels; hence, scaling remains a challenge (see Table 8).

Table 8: Evaluation of Safia Minney's case based on the social innovation assessment tool.

Requirements to be met	**Minney's innovation**	**Yes/No**
The innovation addresses a complex system (Antadze & Westley, 2012).	Addresses the fashion system, which is complex (see chapter 4)	Yes
The innovation addresses social or environmental problems to directly increase human wellbeing (Nicholls & Murdock, 2012).	• Addresses workers' wellbeing directly by paying garment workers living wages and by helping to provide job security. • Addresses farmers' wellbeing by ensuring farmers are not exposed to toxic or hazardous chemicals, transforming and sharing knowledge on how to convert land for organic agriculture.	Yes
The innovation creates programs, processes, platforms, products, or systems (Antadze & Westley, 2012).	• Sustainable fashion, not just sustainable clothes: People Tree's style is based on artistic details, fair trade and organic cotton. • Fair trade fashion without hazardous chemicals, a sustainable alternative to fast fashion. • Created a process on how to transform the land from conventional to organic cotton production.	Yes
The innovation has novelty; it is new, original, or unusual (Antadze & Westley, 2012;	• Until recently, both sustainable fashion and fair trade were rare concepts in the fashion	Yes

Requirements to be met	Minney's innovation	Yes/No
Butzin et al., 2014; Mulgan, 2006b).	industry; and certainly in 1991, these ideas were novel and highly unusual. • She is a 'one-of-a-kind' expert in transforming land from conventional cotton production to an organic one and has implemented the technique in different countries.	
The innovation has a transformative impact. It profoundly changes the basic routines, resources, and authority flow or beliefs of the social system (Westley et al., 2013).	• People Tree profoundly changed how garments were produced, by using no pesticides and herbicides in crop production for fibres, and by paying workers a living wage. This transformative impact is felt in the communities producing the crops and the garments.	Yes
Scale: At least one of the following requirements must be met		
Innovation is scaled out. Scaling out means replicating and diffusing the innovation to impact more people and reach larger geographic areas (Westley et al., 2014).	• The company has grown to a remarkable size in terms of revenue, number of customers and supported workers. • There are over 200 stores across Europe. • Minney has extended the supply chain of People Tree to different countries.	Yes
Innovation is scaled up. Scaling up implies changing institutions through policies, rules, and laws (Westley et al., 2014).	• Minney has helped in starting organic cotton production in India and works with the mainstream fashion industry as a consultant on how to transform land for organic agriculture. • While she successfully advocated for the Modern Slavery Act in the UK, other countries need to follow. • Although she uses speaking opportunities, like World Economic Forum's meetings in Davos, to promote her vision of sustainable fashion and to conduct business for the benefit of consumers and suppliers, fair trade is still not mainstream.	in progress
Innovation is scaled deep. Scaling deep transforms people's values, cultural	• She cooperated with Vogue to present fair trade fashion to change the consumer perspective that sustainable fashion is not fashionable.	in progress

Requirements to be met	Minney's innovation	Yes/No
practices, and relationships (Moore et al., 2015).	• Wants to change customer values, calling for a change in consumption patterns; has written various books about slow fashion and slave labour in the fashion industry; has been featured in international outreach like *True Cost.* • Although Safia Minney has become one of the most prominent leaders in the sustainable fashion movement and has contributed to transitioning the industry; however, the culture of the industry is still unsustainable.	
Innovation has high durability (desirable, but not a requirement)		
The innovation encompasses multiple scales: out, up, deep (Westley et al., 2014).	• Although the company is a remarkable size, there is a constant battle to compete against fast fashion's low prices. While the mainstream industry increasingly uses organic cotton, it has become a competition. Despite significant efforts, there is still a need to scale the innovation up and deep to achieve cross-scale dynamics. The lack of having the innovation scaled at multiple levels means it remains vulnerable.	No

Source: The author compiled the table through the literature review and the interview with Safia Minney (2016a)

Minney is a social innovator who operates as both a social and systems entrepreneur. As such, she wants to scale her innovations out, up, and deep. Her actions extend beyond her social enterprise; she targets the entire fashion system. She creates networks, collaborates with others, builds partnerships, lobbies, and educates others to improve the life of textile and apparel workers.

By showing that actors can be social entrepreneurs and system entrepreneurs at the same time, this case supports the findings from Howaldt, Kaletka, and Schröder (2016); namely, that a

social entrepreneur can constitute a social innovation. As the case of Safia Minney underlines, social entrepreneurs must act like system entrepreneurs to establish their innovation. However, although Minney is both social entrepreneur and systems entrepreneur, she works on the same social and environmental problems, albeit in different ways. Further, she experiences similar challenges. In the interview, she stated that business has become even more challenging over time, because even the mid-market is interested in fast fashion; hence, the competition has become stronger, and garment prices are lower than ever. None of her innovations have scaled up and deep to change consumer culture or made all governments sign and enforce the Modern Slavery Act. This deficit means her innovations remain vulnerable, and that it will remain a constant fight for her company to stay in business.

7.2.3 Summary and Discussion

To more broadly clarify the transformative role of People Tree in the growth of sustainable fashion in the industry, I use Figure 15 from section 3.3 to illustrate changes related to fashion prices and consumption in the fashion industry over the past forty years. The red line shows how garment prices have steadily declined since globalisation began in the 1980s, which has led to an increase in fashion consumption (the blue line). The founding of People Tree in 1991 has led to growing consumer awareness of sustainable fashion, which has been further amplified by the Rana Plaza collapse in 2013 (green line). As the disaster has drawn further recognition to People Tree's efforts to create positive change in the industry, overall demand for sustainable fashion has significantly increased (see Figure 24).

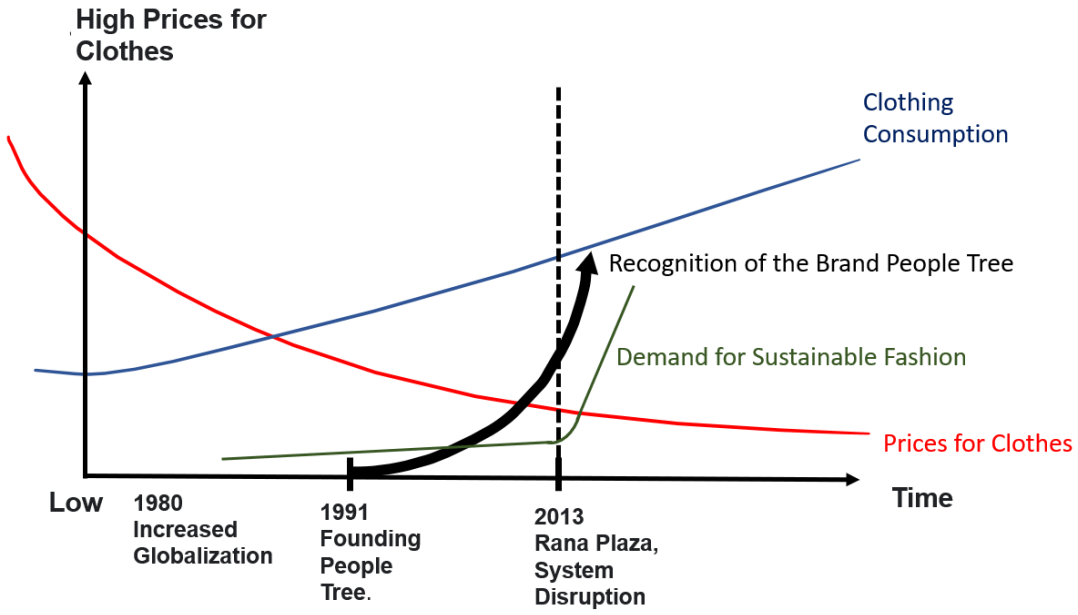

Figure 24: People Tree as a disrupter in the fashion system

Source: Created by the author

Minney's case shows that social innovation in the fashion industry exists in the fair trade niche. Her company and work disrupted the fashion system by showing that fair trade can be economically successful. However, Minney's guiding principles for fair trade are too radical to become mainstream. For example, a call to pay textile workers fair wages rather than minimum wages and introduce fair trade to stop labour exploitation remain at the niche level and are not supported by the regime of the mainstream fashion industry. As A. Smith (2007, p. 430) concluded, niches alone are unlikely to transform systems "since they demand too many (structural) changes … In practice, success is most likely when robust niches are compatible with the regime". This difference might be why even thirty years after the founding of People Tree, few fashion companies rely solely on fair trade.

On the other hand, catastrophic incidents like the Rana Plaza accident in 2013 initiated new opportunities for fair trade. Moore (2017) pointed out that crises or disturbances can

provide opportunities for niches. However, niches do not necessarily benefit directly or cross scales because of crises. While the Rana Plaza accident provided a window of opportunity, it did not influence the landscape to pressure the regime to change its business practices. Nevertheless, many fashion start-ups began their enterprise based on fair trade; and some fashion companies like Eileen Fisher began implementing fair trade into their collections. In 2015, the Wall Street Journal proclaimed, "'Fair Trade' Becomes a Fashion Trend" (Cheng, 2015). However, although fair trade was further scaled out, it did not become mainstream and remained a fashion niche. In other words, the lack of pressure from the landscape on the regime kept the mainstream fashion industry stuck in its conditions of producing garments based on labour exploitation.

The same cannot be said for organic cotton, which has become a mainstream innovation thanks in part to Minney's efforts. People Tree's niche for organic cotton has altered the fashion regime, as organic cotton has become a well-known means for mainstream fashion companies to demonstrate their sustainability efforts to consumers. Today, an increasing number of established fashion companies use organic cotton, and large retail organisations such as Walmart or H&M purchase more organic cotton than People Tree. Minney's work around cultivating organic cotton is compatible with mainstream fashion industry's interests and has helped transition the regime towards sustainability. In this case, Minney scaled her innovation out with the process of scaling up underway. She provided the basis for a transitioning process of the broader regime of organic cotton production.

This positive trend nonetheless involves risk for People Tree. Should the mainstream industry adopt organic cotton on a large scale, it will increase competition for her enterprise. Firstly, People Tree may face more problems purchasing organic cotton due to increased demand; secondly, the company will experience more competition because organic cotton becomes less unique and widely available. If this happens, Minney might lose business. While Grin, Rotmans, Schot, Geels, and Loorbach (2010) claimed that niches operate in safe spaces, Moore (2017) pointed out that there is no guarantee for niches, but instead they can be fragile.

Grin et al. (2010, p. 26) further outlined that “the diffusion into mainstream markets leads to competition with the existing regime.”

Safia Minney is in a difficult situation. To scale her innovation up and deep she needs to change the regime of the mainstream fashion industry, the landscape of the political economy, the capitalistic economic system, and people’s culture of fashion consumption. Geels and Schot (2010), who developed the concept of the MLP, stated that niches cannot directly change regimes or landscapes; instead, the researchers argued that the transition must come from the landscape’s pressure, windows of opportunities and tensions or processes that work across scales. This theory gives Safia Minney little room to act. Hence, Minney’s action should be to grow and sustain her niche business, collaborate with other niches, or interact with the mainstream fashion industry. She needs to create more robust networks, negotiate agendas, create alliances to work together, lobby for better laws and regulations, build up pressure, create disturbances, and produce a window of opportunity. However, there is no guarantee that all these actions will achieve the desired goal. Geels and Schot (2010) referred to a system resistant to transformation as “locked-in”. Locked-in means transitions do not come easy if systems are stabilized in many ways (Geels & Schot, 2010). This theory might suggest that the fashion industry could be locked-in, making it resistant to radical change despite social innovations.

7.3 Conclusion and Main Findings of Chapter 7

Chapter 7 presented an assessment tool to determine what is required for social innovation. The tool was then used to evaluate Minney's case as an example of social innovation. Further, this chapter presented an overview of the role of the innovator as the agent who initializes a social innovation process and the person who creates the environment in which the innovation can grow.

Minney's case shows that social innovation in the fashion industry exists at the niche level of fair trade. While she has shown that her innovation has transformed the lives of thousands of textile and garment workers, fair trade is too radical in its approach to transform the mainstream fashion industry. Hence, her innovation could not change the regime and landscape of the fashion system. The case supports Smith's (2007) findings from social innovations in other industries such as Eco-Housing and Organic Food in that green niches can be successful but are often too radical to change the entire system. The situation is different for her organic cotton innovation, where the mainstream fashion industry started to integrate organic cotton products and uses Minney's solution to solve some of its problems.

Finally, this chapter confirms that a person can take on different roles in the social innovation process and can be a social entrepreneur and system entrepreneur at the same time.

CHAPTER 8: Social Innovation in Textile Recycling and Fibre Production

The previous chapter outlined the requirements for successful social innovation and distinguished between social entrepreneurship and systems entrepreneurship, illustrating these concepts with a case to demonstrate that social innovation exists in the fashion industry and can have a transformative impact, even at a niche level.

This chapter ties all chapters of this dissertation together to address the overall research question and contribute to a better understanding of how to transition the fashion industry towards sustainability in the problem domain of consumption and the resulting textile waste through social innovation. However, before I address the overall research question, I will answer which social innovations exist around textile recycling and sustainable fibre production and what has been the role of social entrepreneurs and system entrepreneurs in building these innovations. I introduce three social innovation cases working in this problem domain to conduct a comparative case study to gain insights into the nature and characteristics of the cases and the role of the innovator in establishing and scaling these innovations out, up, or deep. Next, I use the assessment tool for the requirements of social innovation developed in Chapter 7, Table 7 to evaluate each case.

Two of the cases (the first and third) are promising because the innovators are still trying to establish their innovation; hence, it is unclear whether they will become innovations. The second case is recognized by Ashoka[9] as a social innovation.

[9] Ashoka is a network organisation that identifies social innovations with the goal to help accelerate them by creating cross-sector communities (Ashoka Canada, 2021).

1. The first case concerns social entrepreneur Stacy Flynn, who created Evrnu, a start-up that recycles cotton waste back into reclaimed cellulosic fibres. This social enterprise is a privately-owned, for-profit company that combines business interest with social interests.
2. The second case describes the innovation of Nicole Rycroft, founder of Canopy, an organisation committed to conserving ancient forests by creating market commitments for sustainably produced cellulosic fibres. This case relates to sustainable fibre production.
3. The third case introduces an initiative that I co-founded, the *Ontario Textile Diversion Collaborative (*OTDC*)*. This multi-stakeholder collaboration works with municipalities and charities to get textiles out of landfills by ensuring they are managed correctly.

Approach and Method

I began by searching for novel innovations in the fields of textile recycling and sustainable fibre production. Next, I conducted general literature research in public resources, such as organisation websites and articles, about potential cases. Finally, I sought first-hand information from the innovators themselves: I spoke with Stacy Flynn during the WEAR conference in Toronto, in October 2017, and with Nicole Rycroft during the WEAR conference in October 2018, in Toronto. To experience social innovation firsthand, I conducted a participatory research project which led to the OTDC and is described as the third case.

Based on the cases, the following ten actions were identified as ways innovators try to find support to foster their innovations (see Table 9). These actions can be grouped into five categories based on the type of support they target: financial, human, knowledge, market, power (see Table 9). All three cases are analysed according to these ten actions. The following sections describe how these ten actions have been deducted from the research.

Table 9: Support sought by innovators to foster their innovations

Activity	Targeted Support
Finding funding	**Financial**
Gathering capital	
Finding partners and participants	**Human**
Creating networks	
Investing in research	**Knowledge**
Adjusting goals	
Educating consumers and changing behaviour	**Market**
Creating end-markets	
Using power to set up pressure	**Power**
Lobbying for supportive policies	

Source: Compiled by the author based on the cases Evrnu, Canopy, and OTDC

8.1 Case 1: Stacy Flynn and Evrnu

After obtaining a Bachelor's of Science Degree in Textile Development & Marketing from the Fashion Institute of Technology, New York, in 1998 (Flynn, 2017d), Stacy Flynn worked several years in the fashion industry as a specialist in textiles and textile manufacturing for well-known brands. In 2010, while working for the start-up Rethink Fabrics, a company determined to make

textile products out of recycled plastic bottles, Flynn visited one of their Chinese subcontractors. During this business trip, she had a pivotal moment when she experienced a severe air pollution event, and felt that “something” needed to change (Flynn, 2017c). This moment of recognition was so intense that Flynn could not ignore or dismiss it—she was called to act. Most social innovators remember such life-changing moments (Westley, Zimmerman, & Patton, 2009). Flynn (2017b) recalls: “My colleague and I got out of the car and couldn't see one another through the thick cloud. I travelled for 30 days around the country, and the conditions did not improve. It made me think about how many yards of fabric I had personally created. So, my theory was: If one person can do so much damage unintentionally, what can the same person do to turn it around?”

Flynn returned to Presidio Graduate School, in Seattle; she wanted to learn more about sustainable systems to gain a new perspective on how to improve the environmental degradation of global fibre production (Morrow, 2020). During her studies, she developed the idea of textile recycling and made the necessary connections with other people to plan a start-up. Flynn became a social entrepreneur.

8.1.1 The Role of the Social Entrepreneur

1. Creating the innovation: In 2014, Stacy Flynn founded Evrnu with Christopher Stanev (Flynn, 2017). Evrnu is a start-up located in Seattle that addresses a fundamental problem that hinders a circular fashion system: the lack of technology to recycle textile waste into fibres for remanufacturing.

The company created a closed-loop recycling process: Textiles made from cotton material are broken down at the macro-level with shredding, depolymerized with solvents to produce pulp, and then extruded back into a re-generated cellulosic fibre (Evrnu, 2017). This recycling process is a novel technology that has a transformative impact because it makes it possible to turn textile waste into new high-quality fibres.

However, the company is not a fibre factory; instead, it sells to fibre factories the technical knowledge of how to recycle textile materials with this particular process.

What makes Evrnu*'s* technology unique is not that it solves cotton material — this technology existed already — instead, the novelty is found in the solvent system and the way Evrnu is able to engineer the fibre through the extrusion. The resulting material can be spun into new fibres, which makes it possible to regenerate material of a high quality. Evrnu's reclaimed fibre has a finer denier than silk and is stronger than cotton (Flynn, 2017b). The generated filaments can be further processed, including bleached, softened, or cut into stable fibres.

Evrnu can recycle its fibre up to five times before the cellulose polymers disintegrate into glucose molecules with this production process. Hence, this new type of fibre is already developed to be recycled. Moreover, it can be produced "with 98% less water than it takes to make traditional cotton fibre, and with 90% reduced CO2 emissions compared to polyester production" (Flynn, 2017b).

2. **Finding funding to commercialize the technology:** Since its inception, Evrnu founders sought to demonstrate their technical innovation with a pilot test. Moreover, the company sought funding to invest in additional research and development. The efforts were successful because Flynn convinced funders, exciting them by the novelty of the innovation, the scalability of the business concept, and most importantly, the transformative potential to make the fashion system circular. Finally, in spring 2016, Evrnu partnered with Levi Strauss and Co. to regenerate jeans for the first time in the world (Levi Strauss & Co., 2016). This pilot helped to find further investors.

While the pilot showed that the technology works, it still had to prove it was suitable at an industrial scale. Flynn worked tirelessly to gather further funding to set up a processing plant. She won various prizes such as the *Social Purpose Corp Prize* funded

by C&A Foundation. She was announced finalist of the *Closed Loop Partners (CLP)* and honoured as Woman in Innovation at the *World Economic Forum* in Davos, Switzerland (Flynn, 2017a). All prizes and publicity helped the company to scale its innovation to the level where it now owns a commercial line to meet all its fibre tests before the material is further processed to fabric factories for further application. However, despite a pilot, media attention, funding, numerous partnerships with brand owners, commercialized technology, interest from fabric mills in different countries, and the great potential of Evrnu*'s* innovation, the start-up has still not achieved its goal to become an established company. It remains unclear whether it will have a successful transformative impact on the fashion industry

Evrnu needs to find customers, namely, existing textile mills willing to purchase and work with this technology. In other words, Evrnu needs a diffusion or replication of its technology in multiple geographic locations; it needs to scale-out and establish itself as a tech company to achieve large-scale change.

3. **Gather capital:** Without Flynn's expertise, passion, and network from working more than twenty years in the fashion industry, this enterprise could not exist. However, even six years after its founding, the start-up is still not an established company. Flynn has constantly managed to bridge the funding gaps, but now she needs to find investors to scale out the business model. However, unlocking capital to finance the innovation is a challenge. A recent report released by *Fashion for Good* and *Boston Consulting Group* describes the situation in the fashion industry as follows: "Despite abundant innovation and untapped value, the need for investment remains unmet, slowing the commercialization of new technologies in the fashion industry" (Ley et al., 2020, p. 2). Since investments in the fashion sector are limited, Flynn's personal commitment is even more critical, as all the pressure is on her to keep things running. Westley et al. (2011) confirmed that the ability to diffuse an innovation depends on financial capital and

personal engagement to convince the established structures to change business practices so that transformation can occur (Westley et al., 2011).

4. **Create end-markets for reclaimed fibres:** While the funding is an urgent matter, there is also a need to find customers for Evrnu's technology. However, before fibre mills (Evrnu's potential customers) will invest in such a technology, they want commitments from apparel manufacturers and brand owners that they will purchase regenerated cellulosic fibres for their proposed fashion styles. Further, these commitments must include accepting higher fabric fibre prices because reclaimed fibres cost more than virgin fibres. In short, a market for reclaimed cellulosic fibres must be created, and Flynn needs to help build up this market; otherwise, Evrnu will not be able to scale out and sell its technology to fibre mills.
5. **Lobbying for supporting policies:** Companies using Evrnu*'s* technology will produce a fibre that costs more than any virgin fibre for two reasons. First, the recycling process is expensive and adds to the fibre costs; and second, high cotton subsidies in the US and China further reduce the price for virgin cotton fibres. Hence, Evrnu's technology would benefit from a policy change that would either remove subsidies for cotton or introduce policies that foster recycled materials. While Evrnu is still trying to establish its company, Flynn needs to start lobbying for policy change to scale up this technology.
6. **Educating consumers and changing behaviour:** Even if brand owners are willing to pay more for Evrnu*'s* re-generated cellulosic fibre, the higher fibre costs will create higher prices for the garments. This price increase must be supported by the end consumers' willingness to pay more for their clothes if they are made of Evrnu*'s* reclaimed fibre. However, this requires that consumers be able to recognize this fibre.

Evrnu developed a fibre that differs from other regenerated cellulosic fibres in various ways: production process, solvent, and materials used. Therefore, the company could apply for a Federal Trade Commission (FTC) code for its invention to protect the copyright and market the fibre as a new generic fibre. While receiving a permanent code can take years, it would be a strong sales argument. Still, consumers need to be convinced to spend more and demand a regenerated cellulosic fibre. In 2020, the global market

share for cellulosic extracted fibres was 6.4 percent. The market has increased over the last several years and continues to grow but remains small (Opperskalski, Siew, Tan, & Truscott, 2020). Evrnu*'s* technology has the potential for transformative impact, but consumer education needs to go along with business development. For successful long-term business growth, Evrnu needs to address consumer behaviour and convince consumers of the advantages of its new generic fibre. Hence, scaling deep will become mandatory.

An overview of the evaluation of the case, based on the social innovation assessment tool, is presented in Table 10.

Table 10: Evaluation of Evrnu *based on the social innovation assessment tool*

Requirements to be met	**The Startup Evrnu**	**Yes/ No**
The innovation addresses a complex system (Antadze & Westley, 2012).	The fashion industry is a complex system, and textile recycling is part of this industry.	Yes
The innovation addresses social or environmental problems to directly increase human wellbeing (Nicholls & Murdock, 2012).	Evrnu's technology reduces the amount of solid textile waste directly, and reduces resource depletion of land, water, and energy indirectly.	Yes
The innovation creates programs, processes, platforms, products, or systems (Antadze & Westley, 2012).	The company sells the technology needed to recycle cotton fibres. The technology is based on a unique solvent system for cotton fabrics that engineers the fibre through extrusion into a high quality regenerated cellulosic fibre.	Yes
The innovation has novelty; it is new, original, or unusual (Antadze & Westley, 2012; Butzin et al., 2014; Mulgan, 2006b).	This is a novel technology which produces a new generic fibre type.	Yes
The innovation has a transformative impact. It profoundly changes the basic routines, resources, and authority flow or beliefs of the social system (Westley et al., 2013).	The innovation makes closed-loop recycling for cotton fibres possible while achieving a high-quality fibre, thereby reducing the number of virgin fibre materials.	Yes

Scale: At least one of the following requirements must be met		
Innovation is scaled out. Scaling out means replicating and diffusing the innovation to impact more people and reach larger geographic areas (Westley et al., 2014).	Founded in 2014, the company established a pilot; further, it owns a commercial line to make all the tests before the material can be further processed. However, the company still needs to sell its technology to fibre mills.	In pro-gress
Innovation is scaled up. Scaling up implies changing institutions through policies, rules, and laws (Westley et al., 2014).	So far, the start-up is not working on institutional change.	No
Innovation is scaled deep. Scaling deep transforms people's values, cultural practices, and relationships (Moore et al., 2015).	So far, the start-up does not address people's values or culture. However, if the company receives an FTC code, consumer education becomes a must.	No
Innovation has high durability (desirable, but not a requirement)		
The innovation encompasses multiple scales: out, up, deep (Westley et al., 2014).	No, Evrnu is not an innovation yet.	No

Source: The author compiled the table through the literature review

8.2 Case 2: Nicole Rycroft and Canopy

Nicole Rycroft started as an activist, blocking roads to keep loggers out of ancient forests. One rainy morning on a mountainside in Clayoquot Sound, while trying to protect old-growth rainforests in British Columbia, she recognized that blocking roads to keep loggers out of the forests was not a solution (Ashoka, 2019, n.a.). She recognized that the logger was not the fundamental problem; it was those who had sent the logger. This was the moment when she realized that she had to come up with an innovation that addressed the roots of the problem. Shortly afterwards, Rycroft started to examine the markets for logged trees and founded Canopy in 1999. Rycroft became a systems entrepreneur and later an Ashoka fellow.

8.2.1 The Role of the Systems Entrepreneur

1. **Creating the innovation:** The environmental NGO Canopy strives to protect ancient forests and to safeguard their biodiversity (Canopy, 2019b). To achieve this goal, Canopy works with the paper and fashion industry to find sustainable sources for their products instead of using ancient forests. By shifting the industry demand towards sustainably sourced materials, Canopy is creating a new market for environmentally friendly alternatives.

   Instead of trying to convince billions of consumers to become aware of the fibre material used for their garments, and only buy garments made from sustainably sourced fibres, Rycroft chose a different approach novel to the fashion industry. Canopy*'s* innovation addressed a fundamental problem of supply chains, with numerous companies working together to produce one product. Each member of the supply chain has only a specific function. It must satisfy the demand of the next chain member. All chain members are connected and follow the same principles, making it difficult to change suppliers in a supply chain without changing the one who is placing the order (see Section 4.1). Canopy*'s* approach did not target the producers of the fibres; instead, it focused on the brand owners in the fashion industry that determine the materials for their orders (see Chapter 6). Rycroft understood the relationship between these stakeholders and recognized the complexity of the issue, which is a typical social innovator's skill (Westley, Zimmerman, & Patton, 2009).

   If the organisation recognises an unsustainable practice, it approaches the fibre mill. Still, if a fibre producer is not interested in switching to a sustainable fibre source, Rycroft contacts the most successful customers of this fibre producer (usually a fashion brand). Canopy tries to work with the brand owners to transform their supply chain. If the targeted fashion brand commits to the required requests, it receives Canopy*'s* public support with printed ads in magazines advertised as Fashion loved by Forests. If Canopy does not receive the support, the organisation blames them in public. The fear of being castigated in public and receiving a negative reputation puts so much pressure on brand owners that they investigate their

supply chains and require change. Rycroft's approach is transformative because it addresses how these sectors work. She targets the origin of the problems and facilitates change in the entire supply chain.

2. **Creating markets:** Further, she uses the economy of scale to create market demand for sustainably produced products and to stimulate investment into sustainable production methods (Ashoka, 2019). She does so by actively addressing the brand owners, convincing companies like H&M, Marks and Spencer, Levi Strauss and Co., and Patagonia to sign a contract to become a signatory company and to commit to phasing out their use of products from ancient forests (Canopy, 2019a). When she has their commitment, she puts pressure on fibre producers.
3. **Creating networks:** Out of a grassroots initiative, funded by some environmental organisations with a few hundred dollars, she started her not-for-profit organisation and worked full time on markets initiatives (Ashoka, 2019). Rycroft succeeded in realizing her vision despite limited resources because she started networking and addressed the people who had the power to make the decisions.
4. **Using power to set up the pressure:** In addition to pressuring businesses to ensure that the fibre supplier uses raw material from sustainable sources (Ashoka, 2019), the NGO conducts audits to ensure companies keep their promises (Fraenkel-Eidse, 2018). With this market power, Rycroft was able to push Lenzing, one of the biggest producers of cellulosic extruded fibres, to commit to no longer using ancient rain forests for their products (Lenzing, 2019). This result shows that Rycroft successfully transformed large institutions at the macro scale. Rycroft kept scaling out her innovation. To date, 70 percent of the global cellulosic extruded fibre producers (Fraenkel-Eidse, 2018) and an additional 105 fashion brands, representing USD 130 billion in annual revenue, or 5% of the global fashion market, have formally committed to stop sourcing from ancient rain forests (Wicker, 2017).

5. **Invest in research:** Although Rycroft has successfully scaled out her innovation, she still wants to convince more brand owners to commit to purchasing cellulosic extracted fibres from

sustainably produced sources. However, to further scale out her innovation and support the producers, she has invested in research and innovative product development (Ashoka 2019). Rycroft recommends that the fashion industry use textile waste and agricultural residues, which can be used like other cellulosic materials (Canopy, 2019a). These initiatives will nonetheless require technology to do so, which is not yet available on the scale. Rycroft will reach a limit where she cannot further scale out her innovation unless there is an acceptable raw material as a supplement on the market.

6. **Lobbying for supportive policies:** In the meantime, Rycroft is also well connected to other international non-profit organisations working to protect ancient forests. Together, they have built a coalition on sharing best practices and supporting each other. Rycroft uses her organisation and her partners' power to pressure governments and to lobby for, and develop, policies to stop using endangered forests for fibre or paper products (Canopy, 2019b). Scaling up is critical: Only through institutional change can ancient rainforests be protected, but at the same time, it is incredibly challenging to implement such change, no matter if it is in Canada, Brazil, or Indonesia.
7. **Educating consumers to achieve behaviour change:** While working on scaling up the innovation, it is also desirable to scale it deep. Rycroft might be able to create a market for recycled fibres, but without a change in the culture of consumption and an increased global population, there will always be pressure to overcome the global fibre gap. So far, Canopy has been extremely successful: “25 million acres of forests have been protected or placed under logging moratorium; 25% of the world's viscose is verified as low risk of being sourced from ancient and endangered forests,” but at the same time, fibre resource use is predicted to double by 2030 (UBS, 2019). If customers do not care whether the raw material for their clothes come from an ancient rainforest, then this demand will intensify the pressure on ancient rainforests. Hence, there is a need to change consumer behaviour to scale the innovation deep and make eco-conscious fashion a social norm.

An overview of the evaluation of the case based on the social innovation assessment tool is presented in Table 11.

Table 11: Evaluation of Canopy *based on the social innovation assessment tool*

Requirements to be met	**The NGO Canopy**	**Yes/ No**
The innovation addresses a complex system (Antadze & Westley, 2012).	The fashion industry is a complex system, and producing responsible fibres is part of this system.	Yes
The innovation addresses social or environmental problems to directly increase human wellbeing (Nicholls & Murdock, 2012).	Canopy saves ancient rainforests from logging and safeguards their biodiversity.	Yes
The innovation creates programs, processes, platforms, products, or systems (Antadze & Westley, 2012).	The company works with the industry to find sustainable sources for their products instead of using ancient forests. It created a system to put pressure on brand-owners to force them to control their suppliers for fibres.	Yes
The innovation has novelty; it is new, original, or unusual (Antadze & Westley, 2012; Butzin et al., 2014; Mulgan, 2006b).	This innovation has a novel approach to saving ancient rainforests.	Yes
The innovation has a transformative impact. It profoundly changes the basic routines, resources, and authority flow or beliefs of the social system (Westley et al., 2013).	The innovation changed the source of raw materials for viscose production away from ancient rainforests towards sustainably managed forests.	Yes
Scale: At least one of the following requirements must be met		
Innovation is scaled out. Scaling out means replicating and diffusing the innovation to impact more people and reach larger geographic areas (Westley et al., 2014).	Today, seventy percent of the global cellulosic extruded fibre producers have formally committed to stop sourcing from ancient rain-forests (Fraenkel-Eidse, 2018). Further, an additional 105 fashion brands representing USD 130 billion in annual revenue, or 5% of the global fashion market have formally committed to stop sourcing from ancient rain-forests(Wicker, 2017).	Yes
Innovation is scaled up. Scaling up implies changing institutions through policies, rules, and laws (Westley et al., 2014).	Rycroft uses her organisation and her partners' power to pressure governments, and to lobby for, and develop, policies to stop using the endangered forest for fibre or paper products (Canopy, 2019b). The NGO is working on expanding the acreage of forests protected or	Partly achieved

	placed under logging moratorium. (So far 25 million acres have been protected) (UBS, 2019).	
Innovation has high durability (desirable, but not a requirement)		
Innovation is scaled deep. Scaling deep transforms people's values, cultural practices, and relationships (Moore et al., 2015).	While Canopy advertises brand owner commitment to support Canopy itself, the global fibre demand is expected to double by 2030 (UBS, 2019). This puts enormous pressure on the NGO. This development also shows the importance of scaling mindsets.	In pro- gress

Source: The author compiled the through the literature review

8.3 Case 3: A Collaboration of Actors and OTDC

After working almost twenty years in the European fashion industry as a product developer and international buyer, I moved to Canada in 2009. While teaching at a college, I was asked to teach the course *Sustainable Fashion*. I accepted the challenge and fell in love with the material, but two questions kept bothering me: "Why did I not know about the unsustainable business practices of my industry? And, if 72% of all textiles in the UK are going into landfill, what is the percentage for Canada?" I decided to return to school to conduct a master's degree at the University of Waterloo in Environment and Resources Management to learn more about sustainability. As a topic, I picked textile waste because I thought that waste had the highest environmental impact on this industry in Canada. I addressed the problem from a social marketing perspective, and after graduating founded a company. My first consulting project was to help the city of Markham set up its textile diversion program. This led to the organisation of the *Tip of The Iceberg Textile Diversion Symposium*. It was a coincidence that I volunteered at a student event at the University of Waterloo and ended up as a guest in a social innovation course. One year later, I started the PhD program in Environment and Resources Management at the University of Waterloo.

In spring 2017, after finishing a course in process facilitating, I sought to begin a participatory research project on social innovation with a not-for-profit partner to tackle the

problem of textile waste in Ontario, Canada. I reached out to Kelly Drennan, founder of Fashion Takes Action, and we agreed to facilitate a process of change to reduce the amount of textile material going into landfill while ensuring the material would be efficiently reused, repurposed, or recycled. We gathered the main players in the field of textile waste. With the funding we received from the *Ontario Trillium Foundation*, we hired a facilitator and organized workshops to develop a theory of change.

8.3.1 The Role of the Systems Entrepreneurs

1. **Creating the innovation:** To determine the roots of the problems and develop a strategy, people from different sectors with various backgrounds and knowledge from different organisations must collaborate. In our case, we had more than 40 stakeholders, municipalities, textile collectors, retailers, industry, and various organisations. When conducting the workshops, we learned about hidden or little-known practices that hinder sustainable development. For example, Ontario's *New Material Only* regulation forbids recycled textiles from being used in new garments or as stuffing in the province. After completing these workshops, the participants wanted to continue the work and joined the Ontario Textile Diversion Collaborative (OTDC). The OTDC platform was not founded by a social innovator who had recognized a problem and had an idea for a solution; instead, a group of people shared the idea of ensuring textiles no longer went into landfills, and they committed to work on solutions to make textile diversion a broader movement. OTDC established four working groups: (1) Laws and regulations, (2) communication and social marketing, (3) textile recycling and infrastructure, and finally, (4) data generation. Our working groups operated under a leadership committee which developed campaigns and policy positions based on research, discussions, workshops, and experience. Our positions are committed to the environment while considering feasibility and economic prosperity.
2. **Finding partners and participants:** The communication group convinced an advertisement agency to create a pro-bono marketing campaign for the need to donate rather than dispose of clothes. This campaign was developed with different municipalities to inform residents

and textile collectors about ways to effectively manage textile waste. OTDC convinced all big charities and for-profit companies to accept the same conditions of textile material suited for textile collection. Likewise, all municipalities that agreed to work with OTDC also agreed to use the same advertising message across Ontario. Having the same waste practices in Ontario for a specific kind of waste is unique in waste diversion where each municipality typically creates its own waste programs. To reach many municipalities, OTDC offers the informational material for free, and users can add their own logos to the creative. Since the launch of the campaign on October 29, 2019, ten organisations have signed up to use it, forming a positive start to scaling out the innovation.

3. **Educating consumers to achieve behavioural change:** The idea for the social marketing campaign was not only that municipalities use it, but that citizens learn about textile diversion and change their practices towards donating instead of throwing their clothes into the waste. This means OTDC was trying to scale deep. Furthermore, initiatives were planned to engage consumers and additional municipalities.
4. **Lobbying for supportive policies:** The laws and regulation group mainly turned into a lobby group that wrote various letters and discussion papers to the provincial and federal government. OTDC successfully invited representatives to its events; for example, the textile symposium in spring 2019. In spring 2020, OTDC conducted a workshop on Extended Producer Responsibility to explore regulation possibilities and to continue during the pandemic with webinars. One primary goal was to make textiles part of Ontario's environmental plan and a designated waste material. In this case, all municipalities in Ontario would have to track their textile waste and develop textile diversion programs. Hence, scaling up the initiative would be the most efficient way to achieve textile waste diversion rather than relying on voluntary commitments. OTDC applied to an environmental law organisation and was accepted to receive support to explore the duty payback regulation. OTDC then further reached out with a pro bono lawyer to the federal government to lobby against the duty drawback regulation. To have a stronger voice, OTDC connected with like-minded stakeholders across the country, for example, the Canadian Apparel Federation and the Retail Council of Canada. One success was achieved with the removal of

the *New Material Only Regulation* in Ontario. This law forbids the use of reclaimed fibres or recycled down in clothing. Now this law only remains in the provinces of Quebec and Manitoba.

5. **Invest in research:** Since textiles are not a designated waste material in Ontario, it is impossible to obtain valuable data about how much textiles are in the waste stream; municipalities only know if their budget is large enough to afford tracking this waste source. However, without knowing how much textiles are in the waste stream, it is difficult to argue why textile waste is a problem. To find a solution to this gap, the data group successfully partnered up with a company that specializes in waste audits. This research helped to resolve the lack of available textile waste data. Knowing how much textiles are in the waste stream gave OTDC the opportunity to make a stronger case in lobbying and promoting textile diversion.
6. **Adjusting goals:** The recycling group was the only working group which was struggling. No group member had a commercial interest in creating a recycling facility. The lack of technology, the huge investment costs, and no market for recycled textile products made it difficult to conduct a feasibility study or set up a pilot. The OTDC representatives pitched some of the technical challenges at universities, but the desire to solve a social enterprise problem does not make an enterprise. A new strategy was required to address the problem of entrepreneurship in regard to textile waste.
7. **Finding funding:** With a new government in place, funding was cut, and in 2020 OTDC was unable to continue the work. Additionally, the COVID-19 pandemic caused a lot of uncertainty in the textile diversion system, making restructuring of the organisation almost impossible. Despite a lot of valuable work, OTDC did not become a case of social innovation. It was not possible to change the system fundamentally; millions of textiles were still going into landfills. Changing a complex system is a process that requires time and resources. Funding remains limited and uncertain. Funders would like to see results in the course of a year, but laws and regulations are difficult to change in a short time. OTDC was not able to fulfill its mission due to lack of funds and time. Although textile recycling expertise is lacking

in Ontario, it would be too expensive to hire a consultant from outside Ontario to work on this problem.

8. **Finding partners and participants:** According to Westall (2007), innovations can only achieve a significant impact when they are supported within the framework in which they operate. OTDC*'s* work has been between the waste management sector of municipalities, which operate under cost minimization, and textile collectors—mainly charities—which strive to maximize profits to fundraise their missions. A fundamental change would have been to pay municipalities by the amount of material they divert rather than by the amount of waste they manage, or at least to include textiles in their waste diversion strategies. Likewise, a fundamental change for charities would have been to collect all textiles to determine the quality and take on the responsibility for recycling the low-quality materials instead of selling these to a grader. Textile graders operate in the shadows, and not one was willing to become a member of OTDC. However, all textile collectors work with graders; hence there must have been an opportunity to integrate them.

   However, fundamental shifts of a system are only possible if the stakeholders support them. Likewise, the interests of some of the stakeholders contradicted one another in many ways. For example, charities wanted to collect only the valuable materials to make money, but municipalities needed partners that collect everything regardless of the condition. Without any political support, and relying exclusively on voluntary commitment from stakeholders, it was difficult to impact and scale-out the textile diversion innovation across Ontario significantly. Except for a few exceptions, people in Ontario can still throw their textiles into the garbage without consequences. Even worse, throwing textiles in the garbage remains the official Ontario policy. Recognizing this, OTDC has put a lot of energy into lobbying (scaling-up), for example, to make textiles a designated waste material which would require waste diversion programs and tracking of waste material. Westley et al. (2014) claimed that non-profit organisations facing institutional barriers must become institutional entrepreneurs to challenge the broader institutional rules that created the problem. However, even institutional entrepreneurs require time. Funding timelines may not support them. Hence, not every invention becomes an innovation.

9. **Finding funding:** With a new government in Ontario in 2020, funding was discontinued, and OTDC stopped its operation. However, in 2018 Canada's federal government launched an Ocean Plastics Charter as part of its G7 presidency to develop strategies to combat plastic waste on land and in oceans. All of a sudden there was a new window of opportunity to find financial support for textile diversion since seven percent of all plastics in Canadian landfills are textiles, making textiles the third-largest sub-category of plastic waste in absolute numbers after packaging (47 percent) and automotive (nine percent) (Deloitte, 2019). Innovators must be flexible and able to improvise to bridge the funding gap (see Table 12).

Table 12: Evaluation of OTDC based on the social innovation assessment tool

Requirements to be met	OTDC	**Yes/ No**
The innovation addresses a complex system (Antadze & Westley, 2012).	The fashion industry is a complex system with municipalities, textile collectors, and graders.	Yes
The innovation addresses social or environmental problems to directly increase human wellbeing (Nicholls & Murdock, 2012).	A successful textile diversion program by a municipality reduces landfill space and greenhouse gas emissions caused by textile waste. Further, it reduces environmental impacts through the possibilities of reuse and recycling from diverted clothes.	Yes
The innovation creates programs, processes, platforms, products, or systems (Antadze & Westley, 2012).	OTDC created a new platform to bring stakeholders with different backgrounds together and created four working groups to address the challenge from all angles. (One group discussed the lack of data, another developed a social marketing campaign, another looked at laws and regulations, and the last group developed textile recycling strategies.)	Yes
The innovation has novelty; it is new, original, or unusual (Antadze & Westley, 2012; Butzin et al., 2014; Mulgan, 2006b).	Developing one textile diversion strategy and messaging across different municipalities and textile collectors is new to Canadian waste management.	Yes
The innovation has a transformative impact. It profoundly changes the basic	The innovation makes municipalities use the same waste diversion message. Ontarians	Yes

routines, resources, and authority flow or beliefs of the social system (Westley et al., 2013).	donate all their textiles by diverting them from the waste stream.	
Scale: At least one of the following requirements must be met		
Innovation is scaled out. Scaling out means replicating and diffusing the innovation to impact more people and reach larger geographic areas (Westley et al., 2014).	Founded in 2017, the organisation ran out of funding in 2019. Scaling the OTDC platform outreach to all municipalities across Ontario or other provinces was not achieved.	No
Innovation is scaled up. Scaling up implies changing institutions through policies, rules, and laws (Westley et al., 2014).	While the *New Material Only Regulation* was removed in Ontario (yes), textiles are still not a designated waste material (no). The *Federal Duty Payback* regulation is still in place and needs alteration (no).	Partly
Innovation is scaled deep. Scaling deep transforms people's values, cultural practices, and relationships (Moore et al., 2015).	The culture to throw clothes in the garbage has not changed. People continue to do so.	No
Innovation has high durability (desirable, but not a requirement)		
The innovation encompasses multiple scales: out, up, deep (Westley et al., 2014).	No, OTDC could not scale its innovation; hence, it is not a social innovation.	No

Source: The author compiled the table

8.4. Discussion

The objectives of this chapter were to show that promising social innovation cases exist in textile recycling and sustainable fibre production. While these cases may not seem related, the opposite is the case. The success of one social innovation can support the success of others, which can then feedback and feedforward into further support. Figure 25 shows the three cases and their relationship. In an ideal world where OTDC is successful, and textiles are being separated from the waste stream, the materials could then be recycled with Evrnu's technology into new fibres, reducing the demand for virgin fibres and removing pressure from ancient rainforests. While Canopy helps create markets for sustainably produced products, it also stimulates investment into sustainable production methods, benefitting Evrnu. The increased demand for sustainable

materials increases the value of the separated textiles from the landfill, which would support municipalities and help to compensate for collection costs while reducing required landfill space (see Figure 25). All three organisations will benefit if they join forces and lobby for changes in laws and regulations, and if they continue to work on customer education and behavioural change.

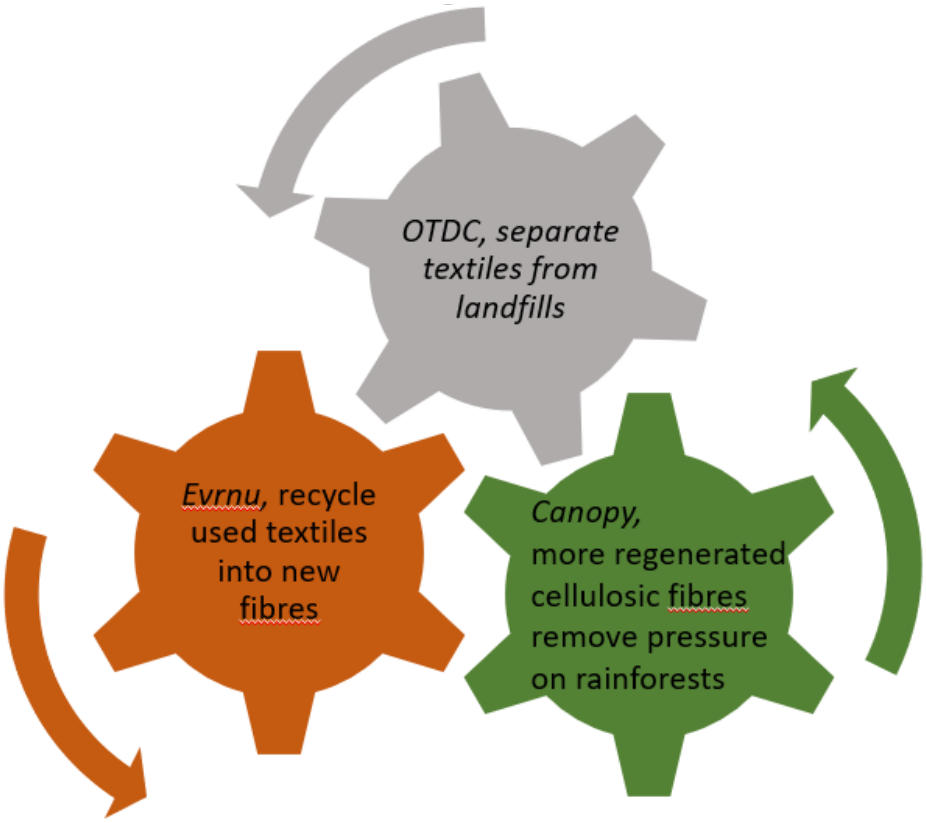

Figure 25: The relationship between the three social innovation cases

Source: Created by the author based on the study

The chapters in this dissertation have sought to contribute to a better understanding of how to transition the fashion industry towards sustainability in the problem domain of fashion consumption and its contributions to textile waste through social innovation.

This dissertation describes various innovations along the supply chain of fashion (see Figure 26), including:

- Canopy, fighting for more sustainable fibre acquisition
- Evrnu, revolutionising fibre and fabric production
- Eileen Fisher, taking back garments and selling them alongside new ones in their circular economy store
- Safia Minney, turning her focus towards the consumer and promoting slow fashion to reduce consumption
- OTDC, seeking to ensure textiles do not end up in landfills

While each innovation has novelty and seeks to achieve systems change, the question remains: Which one(s) will change the system dynamics that created the problems in the first place? The combination of all these innovations may also destabilize the mainstream fashion industry and create a window of opportunity.

This latter possibility is aided by the fact that, although these innovators operate in different countries and niches, they know each other and are connected through conferences, such as the Copenhagen Fashion Summit, and through organisations, such as Textile Exchange, the Sustainable Apparel Coalition, Fashion for Good, or the Ellen MacArthur Foundation. Many of these organisations, mainly NGOs, bring innovators together to foster information exchange while encouraging collaboration and research, producing interactions between the niches. While these activities do not necessarily change the regime (the mainstream fashion industry), it strengthens the positions of these niches and their innovations by framing a common agenda that connects them.

Further, the different innovations of these niches reinforce one another, and in some cases even provide the requirements for another innovation's growth. The result of this mutual interdependence is what I call a "patchwork niche", which is capable of offering a sustainable

alternative to the conventional fashion industry in each step of the supply chain. Patchwork niches are larger than niches; they consist of many niches – which have not just a round shape, as described in the MLP, but have edges and corners where other niches can tie in. They are characterized through diversity and multiple innovations but share a shared vision to replace the mainstream fashion industry. Each niche offers a piece of the larger puzzle that, when assembled, produces a complete picture of sustainability in fashion (see Figure 26). Further research is needed to determine whether patchwork niches are strong enough to create a dynamic tension in the system that can produce a disorder that will allow for its re-organisation.

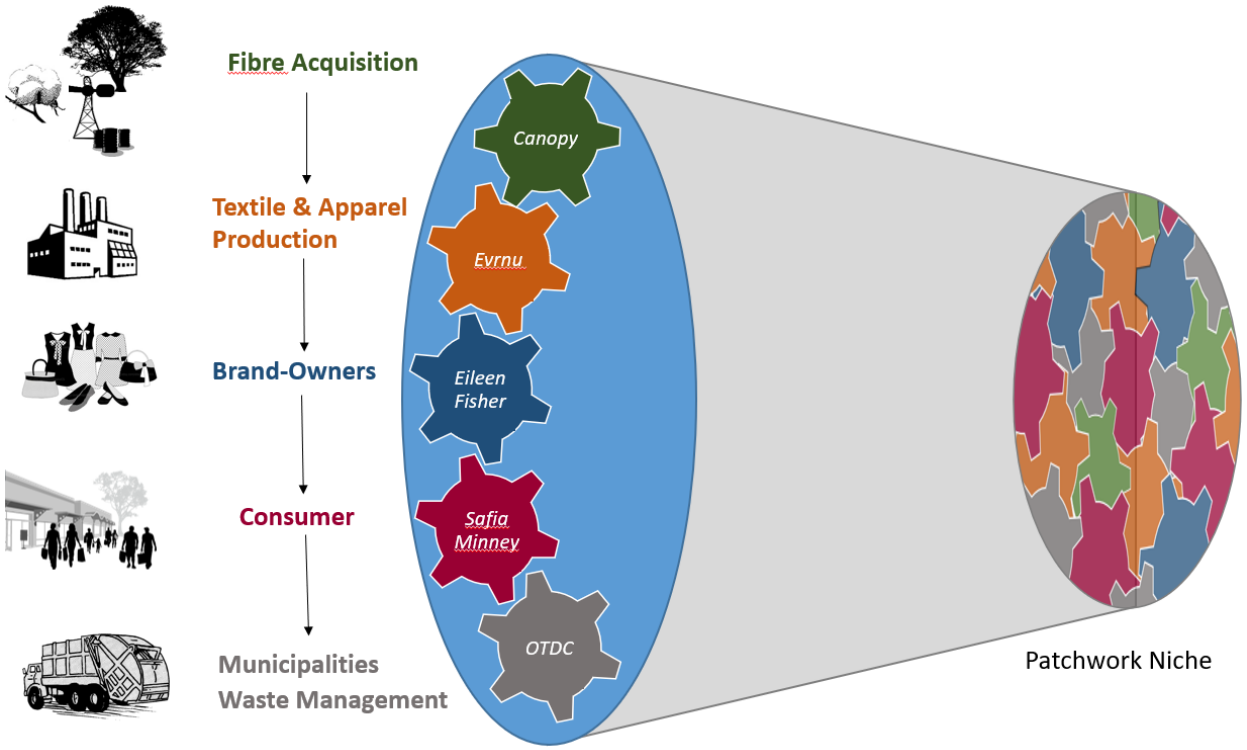

Figure 26: Innovations along the fashion supply chain creating a patchwork niche

Source: Compiled by the author with images from the Clipart Library (Clipart Library, 2021a, 2021b, 2021c, 2021d, 2021e, 2021f, 2021g)

8.5 Summary Conclusion and Main Findings of Chapter 8

The role of social innovator is crucial to the innovation process, as shown through the three case studies. Not only does the social innovator begin the process, but also creates the conditions for the social innovation to grow. The role of agency and how the individual might initiate a social innovation process has already been mapped out in Chapter 7, as were the requirements to recognizing a successful social innovation. Chapter 8 now focuses on the role of the innovator in creating an enabling environment for the innovation while still using the assessment tool to clarify the scale of the innovation.

The three cases show that innovations can and must have different approaches and forms to change a system. Although the three examples work on different aspects of textile waste, they are directly or indirectly connected, and success in one innovation benefits the others. However, the examples also show that change in one problem domain, such as waste, requires multiple innovations. It can only be assumed how many innovations are needed to change the entire fashion system with so many different problem domains.

It is interesting to see how easily policies can disrupt positive innovations in a system. The subsidies of cotton and polyester fibres, which aim to give a country a competitive advantage, cause other countries to respond and support their cotton production with child and forced labour. The cheap fibres that make it possible to produce a more affordable t-shirt also enhance consumption, increase textile waste, and put textile recycling start-ups under price pressure. In an interview, Luke Henning, Chief Financial Officer from the start-up company Circ, stated that the company needs to mix their reclaimed fibres with virgin fibres, not to increase product quality, but to produce a reclaimed fibre material that is competitive in price (Weber & Drennan, 2021). Unless there is a radical shift in politics to change the misaligned incentives, the entire system will struggle to find investors (Ley et al., 2020). The example of OTDC shows how a difference in government provided a window of opportunity for change. It was possible to get rid of the *New Material Only* regulation because the government was interested in deregulations,

which prevented textiles from becoming a designated waste material and being regulated. Social innovation researchers in Europe analysed more than 1,000 cases and found that between 14 and 17 percent of the cases experienced barriers and challenges with legal restrictions and insufficient political support (Howaldt, Schröder, Kaletka, Rehfeld, & Terstriep, 2016). Like the example of the cotton subsidies, finding the origin of a barrier requires a good understanding of the problem because many barriers are indirect and difficult to notice.

Another challenge in scaling is funding—a barrier experienced by both social entrepreneurs and systems entrepreneurs. Howaldt, Schröder, et al. (2016) reported that more than half of the cases of social innovation in Europe lacked sufficient funding to scale their innovations. A funding issue such as this is not exclusively a European challenge: A lack of funding caused OTDC to stop their operations and prevented Evrnu from scaling its technology.

Another barrier reported in the EU-FP7 project is that one-third of the social innovation initiatives lack qualified personnel knowledge (Howaldt, Schröder, et al., 2016). For OTDC, this was not an issue since the innovation began with mutual learning workshops to understand the problem and to collaborate with others to close potential knowledge gaps. On the other hand, every invention requires new knowledge, and without qualified personnel the potential of sustainable innovation remains uncertain. In the case of Evrnu, where the start-up is based on creating new technology, the start-up would not exist without the founder's skills and knowledge.

A fundamental problem in the fashion system is that it is built on mass consumption of garments produced for the lowest price. Changing consumer behaviour to invest in their clothes remains the big challenge. Markets can support but also hinder social innovations. If customers are willing to spend more, this will cause a trickle-down effect, and markets for textile and fibres will change, ultimately helping Evrnu.

Rycroft has found a way to use the power structure of supply chains in her favour as she puts pressure on fibre mills by putting pressure on brand owners. In the case of Evrnu, the

support of brand owners is not enough to change fibre mills partly because of their own business practices. Since the 1980s, the manufacturing sector operates under enormous price pressure. Brand owners do not commit to suppliers; instead, if price targets cannot be met, orders will not be placed, which has eroded the manufacturing sector. Now manufacturers should commit to investments from which they get little benefit without a commitment from brand owners to help finance the investments (Ley et al., 2020). OTDC was able to put pressure on textile collectors to collect all textile materials – not only garments in good condition. However, the collaborative could not put pressure on the graders through the textile collectors to find a solution for managing or recycling low-quality material. Any innovation in the fashion system requires multiple stakeholders because of its long, complicated supply chains.

In most cases, the role of social innovators is to find possibilities to overcome barriers and challenges while creating the conditions for the innovation to grow. Out of the three examples, only Nicole Rycroft and her organisation Canopy is a successful social innovation, showing that social innovation nonetheless exists in the fashion system and can have a transformative and sustainable impact. The OTDC was not a successful social innovation because it could not fundamentally change the system during its funding period. It remains to be determined if Evrnu can scale its innovation to become a successful social enterprise. This shows that time is one of the most determining factors for scaling innovation. For an established company, six months might not be long, but for a start-up it can mean the difference between financial solvency and bankruptcy. This is important to consider since it takes years to receive a Federal Trade Commission (FTC) code.

Even a successful social innovation like Canopy shows how difficult it is to scale an innovation since it requires constant adjustments to keep up with the ever-changing environment. The infographic in Figure 27 shows the direct (the bold darts) and indirect influence (the dashed darts) social innovators use to scale their innovations. OTDC directly tried to influence the behaviour of municipalities and textiles collectors and also reached out to governments and consumers to receive their support. Canopy wants to change the behaviour of

fibre/fabric mills and tries to receive support from brand owners, government, and consumers. While Evrnu also tries to change the behaviour of fibre/fabric mills, it only uses brand owners for support. Sooner or later, Evrnu might need to address consumers to find more support for its fibre. Looking at Figure 27, it becomes apparent the big challenge in implementing social innovations in the fashion system is the "scale".

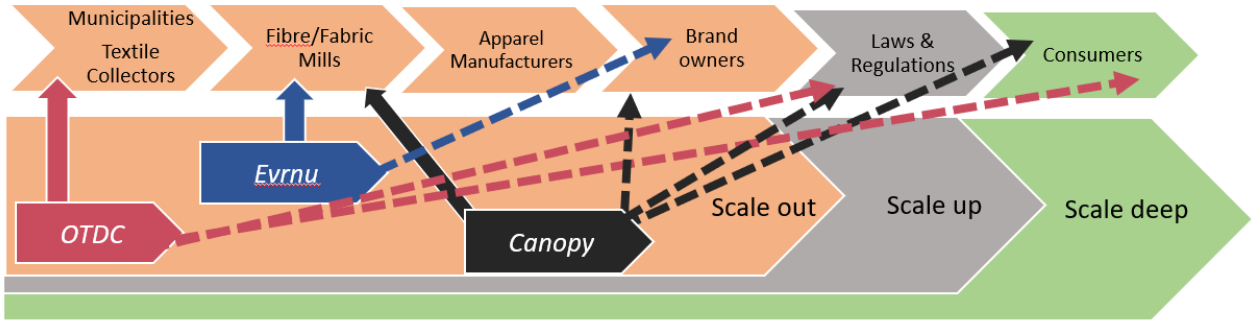

Figure 27: Social innovations and their efforts to scale innovations (out, up, and deep)

Source: Compiled by the author based on the study results

This dissertation introduced various innovations and social innovations along the supply chain of fashion (see Figure 26) to show that a system's change requires multiple innovations. As outlined in Chapters 6, 7, and 8, the challenge for all innovations in the problem domain of textile waste remains scaling. However, innovations can create patchwork niches based on their networks and their mutual dependency. Patchwork niches are larger than niches and have more power to create disturbances in the mainstream fashion industry and can create a window of opportunity, leading to the reorganizing of the system. Hence, successful social innovation can help transition the fashion industry towards sustainability by disrupting the conventional fashion industry and providing sustainable solutions.

8.5.1 Limits and Opportunities for Social Innovation

Many researchers acknowledge how difficult it is to predict if an initiative will be successful and achieve its goal. About seven out of ten innovations fail (Mulder, 2016; Sauser, Reilly, & Shenhar, 2009). Per McGowan et al., "The failure of social innovations to have a long-lasting impact is common" (McGowan et al., 2017, p. 5) and not every social innovation achieves its desired outcome. Van de Ven (2017) further elaborated: The successful outcome of an innovation is difficult to predict because the progress of the innovation processes is non-linear and often includes evolving properties and incidents. Hence, social innovations can fail despite best efforts.

There are different ways in which a system can reinvent after a successful innovation. A concept first introduced by Kauffman (2000) (i.e., 'adjacent possible') and further described by Johnson (2010) as a 'shadow future' is the uncertainty in how the future will develop with all the possibilities caused by the innovation. Any social innovation includes both limits and opportunities for possible change. This uncertainty also inherits the risk that the implemented innovation achieves the opposite of the intended outcome. Supposing all three social innovations were to succeed, would this solve the problem of textile waste and sustainable fibre production, or would the ability to fully recycle textiles make consumers less concerned about consuming more?

CHAPTER 9: Discussion

Chapter 9 provides a synopsis of all the chapters, highlights the contributions to the knowledge, discusses overall findings and limitations, and provides direction for further research.

9.1 Summary of the Research

This dissertation addresses the lack of terminology regarding the difference between fashion and clothes (Loschek, 2009); it does so by exploring the differences between these terms to better understand the drivers of clothing consumption . However, this difference between fashion and clothes is often overlooked by scholars who mainly describe fast fashion (Barnes & Lea-Greenwood, 2010; Bhardwaj & Fairhurst, 2010; Hill & Lee, 2015), yet is essential to consider when developing strategies to reducing consumption. This dissertation presents a validated fashion scale to provide a tool that measures a person's fashion interest. As a result, a person's fashion interest can be used as a criterion to segment markets.

This dissertation outlines the political environment, how globalisation has changed peoples' relationship to clothes, how the system depends on low garment prices, leading to a further increase of consumption and a decrease in garment utilisation. Acknowledging the system's social and environmental impacts (Fletcher, 2008; Lavergne, 2015; Rinaldi & Testa, 2017), it also describes how the fashion system works and how it has adapted over time to become a resilient but unsustainable complex network of suppliers, vendors, and services.

While presenting a framework that connects the drivers of clothing consumption with the industry's different problem domains, this dissertation shows how the system is tied together by low garment prices and low garment utilization. The different types of sustainable fashion are described and built on research from other scholars to enhance sustainable fashion concepts and contribute to the literature (K. Black, 2015; S. Black, 2012; Fletcher, 2010; Minney, 2016b).

The thesis also explores textile waste. A Mic Mac analysis was conducted to examine the various factors that directly and indirectly influence textile recycling. Results were used to develop a strategy on how to encourage textile recycling. Brand owners are the most powerful group in the fashion system and must play a critical role in creating a market for recycled textiles. This dissertation analyses Eileen Fisher's take-back program to better understand how brand owners can contribute to a circular economy and reduce the amount of textile material going into landfill. Results of numerous semi-structured interviews indicated that incorporating sustainability into business offerings provided new opportunities for business development. However, Eileen Fisher's take-back program requires further scaling. Moreover, a few fashion companies acting sustainably does not necessarily lead to larger systems change; such a change would require social innovation.

Social innovation is a process that can fundamentally transform complex systems by introducing new products or processes (Westley et al., 2009). I conducted a literature review on the criteria that must be met to determine social innovation before presenting an assessment tool to evaluate social innovation. This tool's focus is on scaling innovations out, up, and deep; it is built on research by Westley et al. (2014) and Moore et al. (2015). The social innovator's importance is highlighted in the description of Minney's case. This case shows that social innovation exists in the fashion industry at the niche level of fair trade.

Finally, other promising social innovation cases from the fashion industry that were outlined address textile recycling and sustainable fibre production. It is difficult to predict whether an initiative will become a successful innovation (Mulder, 2016; Sauser et al., 2009) and not every case introduced was successful. As the Canopy case demonstrates, however, it has a transformative impact if social innovation is scaled out and up. Since all three cases are from the same problem domain, any single innovation's success can positively impact another's. Unfortunately, all three instances also experience similar challenges. The role of the innovator is to create the solution of the problem and initiate the transformative process. Still, the innovator

must create the condition so that the social innovation can grow and mobilize the financial, human, knowledge, market, and power support needed to create change across scales.

9.2 Academic Contributions

Seven novel contributions have been identified throughout this dissertation:

First, my dissertation presents a validated tool to measure a person's fashion interest. Fashion interest describes how familiar a person is with fashion and how much a person knows about fashion. O'Cass (2004) claimed, that customers gain this fashion knowledge through experiences with previous fashion purchases or through interaction with others communicating about fashion. Since fashion is a significant driver of clothing consumption, there is extensive research into fashion interest (Dhurup, 2014; Kim, 2005; Weber, 2015b), fashion involvement (Hourigan & Bougoure, 2012; O'Cass, 2004), trend sensitivity (Lang et al., 2013), and fashion orientation (Gam, 2011). However, there was no validated questionnaire to determine fashion interest. The Ellen MacArthur Foundation (2017) claimed that transforming the fashion industry requires much knowledge about the motives customers have for using and buying clothes. The fashion interest scale provides each person with a fashion index and insights into why a person is motivated to purchase fashion or clothes. Since the validated fashion interest scale allows the differentiation between clothes and fashion consumption, it can be used to find out what customers are looking for to better serve customers' wants and needs. Hence, this study contributes to a better understanding of the drivers of clothing consumption, and it can be used to develop strategies on how to reduce fashion or clothing consumption. However, a person's fashion index can also be related to other attitudes and behaviours. For example, Weber et al. (2017) found that people with a high fashion interest manage their clothes more sustainability at the end of the garments' life than do people with low fashion interest. The validated fashion interest scale can be used to relate fashion interest with fashion rental services, or second-hand shopping practices, and provide more information about market trends.

Second, my dissertation provides a novel contribution to sustainable fashion literature by introducing the concept of fashion with a conscience. Sustainable fashion, as a term, has become too broad ranging. Still, by acknowledging that all fashion companies are somehow sustainable, we can compare their sustainability commitment and differentiate between different sustainable fashion concepts: slow, eco, and fashion with a conscience. There is extensive research on slow fashion (Fletcher, 2010; Hall, 2018; Minney, 2016b; Nakano, 2009) and eco-fashion (K. Black, 2015; Pookulangara & Shephard, 2013) that must be better integrated with the mainstream fashion industry's sustainability efforts. For an organisation to be truly sustainable, it must have a holistic approach that includes all products, services, and relationships with customers and suppliers, including its business model and how it addresses consumption. Including all sustainability concepts in the literature helps to better reflect the industry's transition towards sustainability, and it helps to clarify differences. This research provides a novel approach that contributes to the sustainable fashion literature by introducing fashion with a conscience to analyse and define the most coherent, sustainable fashion concept.

Third, I used a structural impact analysis to understand why textile recycling is still not the standard in the fashion industry, even though all garments can be recycled in some way (Stall-Meadows & Goudeau, 2012). Structural impact analysis is a method to create a detailed description of a system and reduces systemic complexity to its main factors (Godet, 2010). While textile waste studies often concentrate "on disposal channels, behavioural motivations, disposal reasons and demographics of consumers that behave in specified ways" (Laitala, 2014, p. 44), there is "a lack of research examining the broader system factors that impact recycling" (Ellen MacArthur Foundation, 2017, p. 30). Conducting a structural impact analysis for textile recycling is a new application of this method and specifies the actors' interactions. Findings from the fashion system's structural research have shown that the political environment and the markets are the key factors in encouraging textile recycling. Hence, if governments want to encourage textile recycling, they must purchase their products made from reclaimed fibres, or motivate brand owners to do the same. While consumers have a central role in many systems, and power over their purchasing decisions, this is not the case for reclaimed fibres. We can assume that

customers have no repercussions to purchasing garments made of recycled textiles. Still, it is also less likely that they are buying garments because they are made of reclaimed fibres. This is because customers purchase garments, not fibres. Customers must therefore have a good variety of products to choose from, all made of recycled fibres. My research reduced the system's complexity by looking at the most active factors to increase textile recycling; this is a new approach in the literature on textile waste which, in the past, more often focused on consumers or the technical solutions to recycling textiles but overlooked the importance of markets.

Fourth, a case study (i.e., Eileen Fisher) explored the company's circular economy approach in the luxury fashion industry to highlight the importance and power of brand owners in making fashion circular. Identifying such key actors and showing how they operate is a starting point for change and essential to moving the fashion industry towards a new circular textile economy (Ellen MacArthur Foundation, 2017). While the company's actual environmental benefit remains to be determined, the research shows that implementing circularity can increase business revenue. Most research around clothing take-back programs has focused on consumers' perceptions and participation to support take-back programs (Clary, 2020; Vezzoli, Ceschin, Diehl, & Kohtala, 2015). No research, to date, has explored take-back programs from a brand owner perspective nor has shown how the brand owner manages the program without selling the used clothes to the global second-hand market. Eileen Fisher's approach to embracing circularity has changed the entire enterprise. It has led to the development of new products, created new production methods, changed suppliers, reorganized the business to incorporate new programs and operations, and finally has helped the company gain new customers. For Eileen Fisher scaling its take-back program remains an issue, however. Further investments are necessary in order to increase the program's efficiency, such as including barcode technology, developing standards and criteria to evaluate the received material, and better production processes. While this case provides an example of how a company can implement a circular economy strategy, it can function as a possible example to stimulate imitation by other companies. Still widely unknown is how to put circularity in the fashion system into practice; however, the research findings

contribute to the literature on the circular economy in the luxury fashion sector by examining a company's take-back program.

Fifth, research on social innovation has been applied to various fields and topics but is a new fashion industry approach. I conducted a literature review to describe the criteria that must be met to classify a social innovation case. I follow Antadze and Westley (2012, p. 133) definition of social innovation as "a complex process that produces new programs, processes, platforms, or products that profoundly change the basic routines, resources, and authority flows or beliefs of the social system." Further, social innovation must be scaled out, up, and deep to become durable (Moore et al., 2015; Westley et al., 2014).

Sixth, my research contributes to the literature on social innovation by providing a social innovation assessment tool. It also presents a social innovation case in the fashion industry to show that social innovation exists in fashion as fair trade and that it has a transformative impact. Echoing findings from A. Smith (2007), who looked at fair trade in food and housing, this research shows that fair trade as a concept for the mainstream fashion industry is too radical to become widely accepted. However, if niches can solve the problems of the conventional fashion industry, as the organic cotton example shows, then mainstream fashion companies will implement them. My research aligns with other researchers who have highlighted the importance of a social innovator as the person that catalyzes resources to make change happen (Butzin & Terstriep, 2018; Crawford et al., 2006; Gilmour et al., 1999; Westley et al., 2009).

Seventh, my research presents three promising social innovation cases that are working on textile recycling and sustainable fibre production, and it outlines the social innovators' role and importance while describing challenges in scaling these innovations successfully. This confirms findings from Howaldt, Schröder, et al. (2016) that legal restrictions, insufficient political support, and lack of funding are significant barriers to scaling innovations. However, the Canopy case also shows that successful social innovation can have a transformative impact.

9.3 Discussion and Practical Implications

This dissertation has explored how to transition the fashion industry towards sustainability in the problem domain of textile waste through social innovation.

The first approach in tackling the symptom of textile waste is to reduce clothing consumption. My dissertation outlined the drivers of clothing consumption to demonstrate how difficult it is to minimize fashion consumption since people use fashion to show their individuality and group belonging. Moreover, because of the political economy and new cheaper global production opportunities, customers have lost the skills to make garments themselves and even to conduct minor alterations and changes. As a result, customers can no longer appreciate the work and the resources required to produce a garment.

Cheap fashion has become throw-away fashion and has led to vast amounts of textile waste. Likewise, fast fashion mass-produced garments are often used as retail therapy or as a means to overcome boredom, turning fashion into the consumption of “meaningless” clothes that typify people's unending pursuit of happiness (Bernays & Miller, 1928). This is a reason why sustainable fashion is often unattractive to consumers since it requires that they buy less but pay more. To increase sustainable fashion consumption, customers want more variety; sustainable fashion should follow the same fashion cycle as fast fashion, which is counterintuitive to sustainability. To make fashion sustainable, customers must change their consumption behaviour and overcome their clothing addiction, while governments need to stop pushing their citizens to shop unsustainable garment options. Sustainable fashion is a shared responsibility; this means consumers, governments, and the fashion industry need to change.

My dissertation outlined how the fashion industry became one of the world's largest industries, a complex network of suppliers and vendors eager to produce, even for the lowest price, while trying to resist the enormous pressure and competition on all levels of supply and distribution channels. Despite reform efforts, it remains an industry where labour exploitation

and environmental degradation is common in keeping prices low and consumption high. However, there is an increased global awareness of the industry's negative impact that puts pressure on brand owners to change business practices.

The new vision for the fashion industry is a circular economy approach. By becoming circular, the industry aims to decrease resource use and environmental degradation; textile recycling has become a means to solving the industry's problems. However, currently, there is no fibre-to-fibre recycling available on a scale, so there is indeed a need for technical and social innovations to make fashion circular.

Helping to bridge the gap between the industry's wish to become circular and the required innovations, how brand owners can innovate, and what governments can do to foster textile recycling are outlined in this dissertation. However, to transform the entire system, large systems change is required. Such change can be achieved with social innovation. While social innovation, such as fair trade, exists in fashion, these innovations remain niche, since the necessary changes are so radical the mainstream fashion system cannot adopt and scale these approaches. Likewise, the Canopy case has shown that social innovation can have transformative impact, but that scaling deep remains a challenge. Considering the numerous environmental and social problem domains in the fashion industry, it becomes clear that this system requires more than one social innovation to transition towards sustainability.

Promising social innovation cases address textile recycling and sustainable fibre production but struggle to find funding. While textile recycling presents opportunities for significant transformation in the industry, it remains unclear whether the system can be transformed towards sustainability. Will textile recycling help transition the industry towards circularity, or will it provide an excuse to continue with over-consumption? Or will it lead to increased garment prices and reduced consumption? Based on the required work to recycle a fibre, any reclaimed fibres will be more expensive than virgin fibres, even if governments give up on their virgin fibre subsidies. Theoretically, governments could subsidize recycled fibres and

implement other policies to make fashion more sustainable. However, are they willing to do so, and will this be supported by the WTO?

Sustainable fashion is a shared responsibility between industry sectors, consumers, and governments. All stakeholders must drive the change together. The fashion industry has proven resilient, adopting better business practices while maintaining the unsustainability of the system; it might use the textile recycling innovations to resist a radical system transformation.

9.4 Limitations

Since each study's limitations are provided in the manuscripts, here I focus on the overall limitations.

My dissertation looks at the fashion industry from a North American perspective. Examples of cases, laws, and regulations are typically focused on Canada, and will differ in other parts of the world.

Developing a circular fashion industry is an emerging research topic in academia and in the industry; any research, especially a dissertation, can quickly be out of date, particularly in such an emerging field as textile waste. Further, a dissertation is a lengthy process and some of the sources or data might have changed over time. For example, in the manuscript, a structural impact analysis in Chapter 5, I use a source from the Council for Textile Recycling (2014) which states that, in North America, about 85 percent of all post-consumer textile waste ends up in landfills. This webpage is not available anymore and can only be tracked back; hence, it is unclear if this data is still reliable.

9.5 Future Research

There is a need for more research on how to overcome people's high levels of fashion consumption. One way could be to use people's fashion interest as a criterion to differentiate if people are interested in fashion or clothes and to thereby determine the customer groups most interested in sustainable fashion approaches like clothing renting systems. More research is needed on how a sharing economy can help to reduce consumption.

There is a need to provide guidance and resources that explain and summarize how to produce long-lasting garments which can be repaired and altered. However, designers and product developers have lost the skill even to design and create such clothes.

Transitioning the fashion industry towards sustainability requires large investments. While companies like H&M can set up sustainability-linked bonds to finance their transition, how can medium and smaller sized organisations bridge this finance gap? How can they access new technologies if they are unable to make such large investments? More research is needed to develop sustainable strategies for smaller brand owners and designers.

Sustainable fashion often retails at a premium, which means customers need to be convinced to pay more for their clothes in a system where price plays a key role. However, this also means that companies can only transition if their customers support them. More research is necessary to know how brand owners can gain support from their customers to increase their sustainability efforts.

My dissertation acknowledges how provincial and federal governments in Canada can support a textile recycling industry. Still, there needs to be more research on what policies or regulations are desirable for global governance to create lasting and sustainable change.

Over the last ten years, numerous not-for-profit organisations have been founded to help transition the industry towards sustainability, such as the Sustainable Apparel Coalition, Textile Exchange, The Better Cotton Initiative, Accelerating Circularity, Fashion for Good, and many more. More research is needed to map out all these organisations and cluster them in what they do to analyse how they are connected and cooperate. Such an overview would offer the opportunity to determine what kind of support and research is missing and what needs to be done to increase the efficacy of organisational outreach.

Lastly, Chapter 4 defines the different problem domains of the fashion industry: labour issues, water/energy/land/chemical use, emissions, solid and liquid waste. More research is necessary to confirm that in each problem domain are niches that will develop into patchwork niches, which will disrupt the regime. More research is needed to better understand the role of niches, how they create patchwork regimes and contribute to change (see Figure 28).

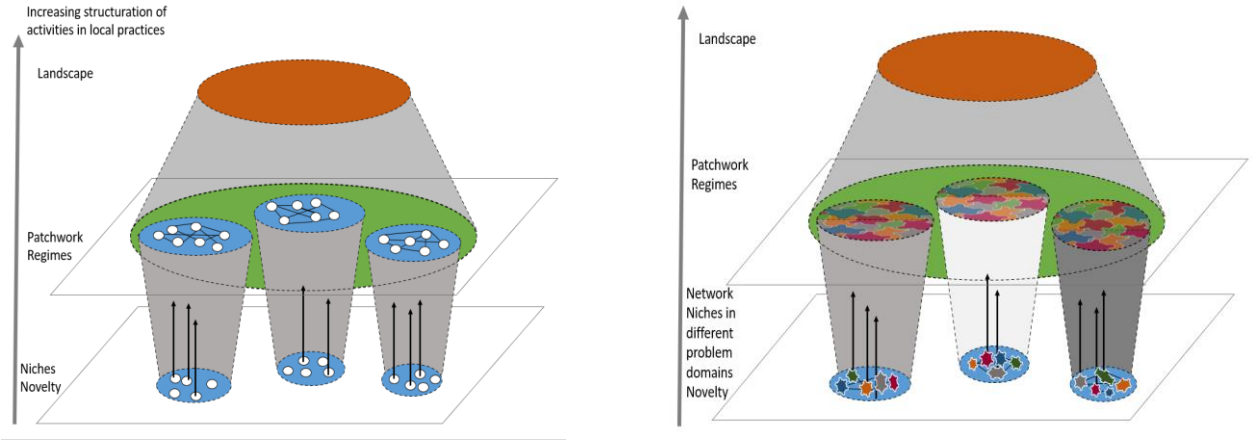

Figure 28: A comparison of the niches in Geels (2002, p. 1261) MLP framework (left) with a modification of it (right)

Source: Framework on the left created by the author

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Appendices

Appendix A: Grading for Matrix of Direct Influences (MDI)

The following overview outlines how each factor influences the other factors.

1. How municipal textile diversion programs can directly influence:

Infrastructure	Municipalities are partly responsible in creating the infrastructure and therefore have a strong influence on it.	3
Fibre mills	Municipalities can supply textile waste to fibre mills; they have a moderate influence on fibre mills.	2
Markets	Municipalities have no influence on markets where fibres will be sold.	0
Price	Municipalities are suppliers of raw material and have a moderate influence on price.	1
Consumers	In North America municipalities have power over consumers to enforce textile waste diversion.	3
Political environment	Municipalities are responsible for waste management programs but need to follow provincial/federal laws and regulations; there is weak influence from municipalities on the political environment.	1

2. How infrastructure, which brings textile waste with the production facilities for fibres/textiles together, can influence:

Municipalities	Infrastructure has a strong influence on the municipalities because municipalities use infrastructure to sell diverted textile waste.	3
Fibre mills	Infrastructure brings municipalities and fibre mills together and has therefore a moderate influence.	2
Markets	The infrastructure has no direct influence on the markets for the reclaimed fibres.	0
Price	The infrastructure can reduce or increase the costs for the reclaimed fibres.	3
Consumers	The infrastructure has no direct influence on fashion consumers.	0

3. How fibre mills can influence:

Municipalities	Fibre mills can provide a market for textile waste; this can be in alliance with the goals of a municipality. However, the influence is moderate because mills and municipalities might be in different countries.	2
Infrastructure	Fibre mills need infrastructure to produce their products. However, fibre mills and raw materials might be in different countries; this limits the influence which mills have on infrastructure.	2
Markets	Fibre mills must create their own markets for their products. If the fibre mill is a start-up, it tries to sell new products to new markets where it has little or no experience; this is difficult. The growth opportunity is less risky if established companies sell new products to existing customers.	2
Price	Since fibre mills set the price of their products, they have a strong direct influence on it, though prices are influenced through competition.	3
Consumers	Fibre mills have no direct influence on fashion consumers.	0
Political environment	Fibre mills can lobby governments to support green technology; however, some of the technology companies might be start-ups with limited resources. Further, there might be controversial interests since fibre mills may be from different countries.	1

4. How markets for reclaimed fibres can influence:

Municipalities	The existence of markets for reclaimed fibres has a moderate influence on municipalities.	2
Infrastructure	Markets have a moderate influence on the infrastructure.	2
Fibre mills	Markets have a strong influence on fibre mills.	3
Price	Markets have a strong influence on price for reclaimed fibres.	3
Consumers	Markets for reclaimed fibres have no direct influence on how consumers mange their garments at end of life.	0
Political environment	Markets for reclaimed fibres have a weak influence on the political environment of a province.	1

5. How the price of reclaimed fibres can influence:

Municipalities	A high price for reclaimed fibres can motivate municipalities to divert more textiles (release a ban for textiles in landfills); however, influence is limited by the amount of waste.	2
Infrastructure	Depending on the price, infrastructure can be under pressure or in favour; price has a moderate influence on infrastructure.	2
Fibre mills	The price of the reclaimed fibres has a strong influence on fibre mills.	3
Markets	The price of the reclaimed fibres has a strong influence on the market.	3
Consumers	The price of the reclaimed fibres has no direct influence on the fashion consumer.	0
Political environment	Extremely high or low prices for reclaimed fibres have a weak influence on the political environment.	1

6. How the fashion consumer can influence:

Municipalities	Fashion consumers have a strong influence on textile waste diversion programs of municipalities.	3
Infrastructure	Fashion consumers have no direct influence on the infrastructure.	0
Fibre mills	Fashion consumers have no direct influence on the infrastructure.	0
Markets	Fashion consumers have a weak influence on the markets for reclaimed fibres.	1
Price	Fashion consumers have a weak influence on the markets for reclaimed fibres.	1
Political environment	Consumers have a strong influence on the political environment.	3

7. How the Political Environment can influence:

Municipalities	The political environment has a moderate influence on the waste management policies of municipalities.	2
Infrastructure	The political environment has a strong influence on the infrastructure, but the influence becomes moderate when other countries are included.	2
Fibre mills	The political environment has a weak influence on fibre mills.	1
Markets	The political environment has a strong influence on markets for reclaimed fibres through its own procurement.	3
Price	The political environment has a strong influence on the price of reclaimed fibres.	3
Consumers	The political environment has a moderate influence how consumers must manage their textile waste.	2

Appendix B: Cultivating a Circular Economy Mindset in a Retail Space

The Lab Store: This store is unique among most fashion retail stores in that it seeks to explain a circular economy fashion model to customers while still offering the effect of a luxury store. The sales associate explains: “She [the customer] really gets to understand the whole story, it represents all the different aspects of the life of her clothes.” At the store entrance, for instance, visitors are greeted by a display of reclaimed cashmere sweaters set next to a garment from the sample collection (pieces which have been developed but did not go into production) and finally pieces from the current product line. The lab also offers a maker space with a working table and sewing machine where classes for knitting, and sewing are held and where customers have the opportunity to purchase manufacturing ends of yarn and fabrics as well as one-of-a-kind remade pieces. There is a sales section in one corner and a “Renew” section in another where all used and seasonably appropriate garments in perfect condition are sold.

Appendix C: EF Interview Participants and Questions

Director for Social Consciousness

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- How does EF innovate?
- Can you describe EF's actions related to fibre recycling?
- What is the difference between the circular economy team and the sustainability team? How is the circular economy team embedded in the organisation?
- Can you describe how the circular economy approach started and how it has evolved?
- What are the challenges to making the circular economy model financially viable? What other challenges need to be overcome?
- Is the Reuse Program a viable business component of the EF company?
- What are the opportunities for Eileen Fisher resulting from its circular economy work? What other business expansions has EF considered?
- What has EF's B Corp certification meant for the EF enterprise?
- Can you explain Eileen Fisher's idea behind the Employee Staff Ownership Plan?
- What are the biggest challenges for EF in terms of sustainability? Which role does the supply chain play in terms of sustainability?

Manager of the Take-Back Program

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- Can you take me through the development of EF's take-back program? What were some of the main drivers for the program?
- What have been some of the notable developments in the take-back program?
- How many jobs did the program create?
- Could you describe EF's current business model in relation to its remake program?

- Does the remake program represent a new business model for EF? What about the Reuse Program?
- Do you think other brands will offer remake and Reuse Programs in the future?
- Do you think these programs will become essential components of future business models?
- Do you think retail stores will sell second-hand clothing alongside their new clothes in-store?
- How does EF plan to scale its remake program?

Sales Associates in Irvington and in New York City

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- Can you talk me through a customer's typical first experience navigating EF's Irvington store?
- How has EF sought to showcase its circular economy approach to customers in-store?
- What is the rationale behind EF's in-store signage?

Recycle Operation Manager

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- When did EF start the factory?
- Can you explain EF's system processes related to sorting, mending, cleaning, and remaking of the returned EF garments?

Designer Reuse Program

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- Can you explain EF's system processes related to sorting, mending, cleaning, and remaking of the returned EF garments?

Wholesale Marketing Manager

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- What distinguishes EF garments as luxury products?
- How has EF sought to cultivate an international presence as a luxury brand?
- Could you give me an overview of EF's collections? What are the volumes?
- Can you describe the rationale behind EF's in-store sales events?
- In what ways does EF seek to promote the circular economy approach with its retail partners?
- How has EF sought to showcase its circular economy approach to customers in the wholesale retail environment?
- What challenges must EF overcome to bring its circular economy approach to retail partners?
- What does EF see as the advantages of bringing this circular economy approach to the wholesale environment?
- Do the reuse and resewn programs reach new customer bases? Do the same customers who purchase EF garments also purchase the reuse line?
- What are some of the obstacles blocking wholesale partners from participating in the program?
- How does EF distinguish between its own brand and luxury fashion brands?
- What role does sustainability play in its brand messaging?

Buyer for EF Retail Stores

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- Can you talk me through how the take-back program works?
- Does the reuse, resewn program reach new customer bases? Do the same customers who purchase EF garments also purchase the reuse line?

- What are the price differences between the multiple EF lines?
- To what extent does EF consider the circular economy approach a part of its brand identity?
- To what extent do you think the EF customer is aware of the company's circular economy approach?
- What have been notable factors in the success of the EF brand?
- Can you describe the logistics of the EF renew line?
- Does the remake program represent a new business model for EF? What about the Reuse Program?
- How similar are the aesthetics between the original and the renewed EF garments?
- How has EF approached these differences in regard to its brand identity?
- Who are the ambassadors for EF?
- How does EF work to attract younger customers?
- How has EF worked to extend its product line?
- What distinguishes EF garments as luxury products?

Knitwear Designer

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- What is your background in designing sustainable fashion?
- What distinguishes EF garments as luxury products?
- How responsive is EF to fashion trends?
- What terms would you use to describe the EF clothing style?
- To what extent does a circular economy approach influence your design choices? Do you design with circularity in mind?
- Can you describe a typical working day for you? What are the departments you liaise with to develop the collection?

Sustainability Leader

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- What sort of environmental assessments have been conducted regarding EF's take-back program?
- Can you elaborate on any of these assessments?
- What do you think is the biggest environmental impact of the EF take-back program?

Facilitating Manager for Fabric R&D

- Could you please introduce yourself? What is your name, your position, and how many years have you worked at the company?
- What reclaimed fibres have been developed at EF and what are the problems with reclaimed fibres?
- What is the difference between developing a new fabric quality compared to a renewed fabric quality?
- How many fabric qualities based on reclaimed fibres is EF currently using?
- When did EF begin using reclaimed fabrics?
- Is there enough reclaimed fabric on the market for the luxury sector to scale sustainable textiles?

Appendix D: Safia Minney Interview Questions

Determining if she is a systems entrepreneur, and what her characteristics, values, and skills are

Motivation for the social innovation

1. Why did you develop a social enterprise? What has changed or happened in your life that caused this decision to act?
2. Your company is rooted in a strong value system; how does the company reflect your values? How did you develop those values, what guides you?
3. What drives your motivation? Do you have a vision for your industry?
4. How do you define success?

Ability to manage resources

5. Is there any work that takes all your attention, making you forget everything around you and providing you with an experience of flow?
6. Being successful for such a long time, how do you make sure you are not getting blind to change and stay on track? How do you retain your energy and resources?
7. How good are you at improvising?

Strength to manage drawback and overcome doubts and limits

8. Being successful often includes ups and downs; have you ever had doubts about your work or yourself? Have you ever thought about giving up?
9. Have you ever experienced failure and felt isolated and despaired? If so, how did you overcome these challenges?
10. Have you ever experienced in the work that you have reached limits? How do you overcome such limits?

Personality

11. Starting a fair trade company competing against mass fashion requires a lot of courage, what gave you this courage?
12. Have you ever stepped out of your comfort zone and become someone "bigger than yourself" to achieve something you never thought you could, and, if so, can you share this situation?
13. How has your work changed over the years, and how did you change?

Leadership and strategic thinking

14. Are you willing to **take on the lead** and use opportunities to improve or change a system?
15. Once you have reached a **goal,** what are your next thoughts?
16. Do you take time for **self-reflection**?
17. What percentage of your personality is a **thoughtful actor or restless thinker**? Or, does this not relate to you at all?

Interaction with others

18. How did you **interact with others** who have the potential to transform the system into a new direction? Can you give examples?
19. How important is it for you to exchange ideas with others and collaborate?
20. Have you actively built your network, and, if so, how would you describe it?

Interest and commitment to scale

21. How important is it for you to foster the development of new minds and skillsets to achieve a large-scale **pattern-shifting impact**?
22. Do you see a need to **change regulations and policies** to remove barriers for transitioning? Are you taking any actions to change any regulatory and policy barriers?

23. How did you try to change the **mindset of consumers**?
24. What do you think? Why haven't more companies **followed your example** and transitioned their business towards sustainability?

Appendix E: Interview with Safia Minney

The style and presentation of this interview is similarly inspired by the case studies presented in the book *Getting to Maybe*; it describes a life story and includes many citations from Safia Minney plus additional background information about the political, economic, social, and technological environment (PEST). The interview took place in the Intercontinental Hotel in Toronto on October 31, 2016.

Safia Minney's life story

Even at 20 years of age, Minney was an ethical consumer. Rather than spending any of her money on something that would create exploitation, she chose to spend every pound she had to support the social good. This is Safia Minney's story, a woman who recognized the unfair pattern in fashion production early on in her career and sought to explore a different path by developing sustainable fashion.

> *As I came through immigration in Toronto, the immigration officer said: "What are you doing here?" I said: "Oh I'm doing a talk." She said, in a very surly way, she is probably about twenty-two - twenty-five, really young. She said: "Oh what's it about?" I said, "It's about ethical fashion." She looked at my passport and she went, "I know you!" It was just so great. She went: "Ethical fashion, that's amazing. You are here in Toronto. I saw you in* True Cost*. You're Safia, aren't you?" It's really lovely that even the immigration officers, not just fashion people becoming interested in ethical fashion (Minney, 2016a).*

A Short History of the Fashion Industry

In the 1960s, two mega trends arose in Europe and in North America: a shift in lifestyle towards more leisure activities, and a demographic shift towards a younger population. In fact, the massive 'baby boomer' generation caused the teen market to grow rapidly. Simplified styling and

sizing, mass production sewing in large factories, and distribution through retail became the norm. By the late 1970s and early 1980s, the industry saw a decline in consumer demand for products and an increase in overall costs of labour, energy, and material (Burns et al., 2012). For the first time, people had more 'stuff' than they needed (Lewis, 2011). 'At-risk' apparel companies either went out of business, merged with other companies, were bought out, or invented ways to entice shoppers into their stores to create 'demand' in the consumers' minds (Burns et al., 2012, pp. 24-25). Thus, 'marketing' as a business strategy had come to the apparel industry (Lewis, 2011), and with it price began to play a major role in all purchasing decisions. The apparel industry has always been very labour intensive but low in technical investment, making it an ideal industry for low-cost labour countries. Globalisation became the solution for an entire industry based on searching for the lowest garment price as well as for a growing number of consumers in Northern America and Europe seeking ever cheaper fashionable clothing.

Minney's Early Years of Work

In the early 1980s, when Minney was 17 years old, she left school. She thought about becoming a speech therapist or working with mentally challenged people, but out of school and seeking employment, she took on two jobs unrelated to her original ambitions: one in a very expensive jewelry shop in downtown London, and the other with a small publishing company which had just launched a new Sunday magazine. Her grandfather and grandmother had both been in the book-selling and publishing business and the field became increasingly interesting to her. After working in publishing for several years, Minney felt that creativity and communication should be used to make the world a better place. At 22, she started a social marketing agency, working with arts, current affairs, and environmental groups like New Statesman, Friends of the Earth, and Spare Rib (Minney, 2016a).

One day in the late 1980s, Minney and her husband received job offers, one in the US and one in Japan, but with the conservative values of Ronald Reagan as President she felt her efforts

might be better served in Japan. “I think working in Japan was really good training for me,” Minney recalls, “both in terms of discipline of process and thoroughness of product design execution and plan execution.” She studied Japanese and began working for Amnesty International. However, she felt that activism alone could not create change, so she started working on solutions to the challenges.

“I think I've always been the kind of activist that has wanted to see change and has wanted to see an action that comes out of campaigning. I felt very frustrated with activism that there was not an easy engagement so that whilst you were lobbying against something, you could also be suggesting a solution. People first protested about that thing, but then being part of the solution, they could have much more impact” (Minney, 2016a).

Recognizing the Pattern of Trade in Fashion

Around the time Minney moved to Japan, the fashion industry fully embraced globalisation. While companies formerly produced clothing in countries by taking advantage of their cheaper wage levels, when all fashion companies produced garments overseas, the comparative price advantage decreased, and factories turned into places of labour exploitation as a result. Recognizing this shift early, Minney also realized that the pattern of conventional trade often undermined human rights—that it puts workers in danger of, in her words, “acute exploitation”(Minney, 2016a). She recognised that the industry was based on child and forced labour, wages below minimum averages, with long, forced working hours in unsafe conditions, and without the right for communication or self-organisation. The fashion business is built on exploitation where working people cannot afford to provide education for their children, often pushed into the labor force by their parents as early as twelve. Minney identified conventional trade, with its lack of transparency, as a threat to human rights.

While fair trade in the UK had long roots going back to the late 1950s, when Oxfam UK wanted to buy better products, there was no such organisation or movement in Japan. When she

could not find any clothing in Japan that was fair trade, she channelled her frustration into People Tree's founding, the first fair trade fashion company in Japan. People Tree satisfied the personal desire for ethical clothing and provided an option for friends and other supporters that she had met at Amnesty International. To show that clothing could be made ethically, Minney used a radically different approach from the global mainstream fashion industry regime. By refusing to use slavery to produce her products, she developed a strategic niche and demonstrated what Westley et al. call a "can do" attitude (Westley et al., 2009, p. 20), becoming a fashion producer driven by her desire for fair trade fashion.

> *I think starting People Tree was my calling, it was my life's work. As an ethical consumer, probably one of the first in the late eighties, early nineties, I wanted everything that I bought to be fair trade. I wanted it to be made with dignity to the workers. I wanted it to be made with dignity to the farmers, the tailors, and with respect to the environment. If those products did not exist, then I wanted to try to make them… It felt right that I took [fair trade] to my new home, Japan. This kind of double-edged approach was about campaigning but also creating social change" (Minney, 2016a).*

A Call- to- Action

Social innovation requires action, which usually starts with questioning and thinking about an issue. Westley et al. (2009, p. 22) reported that innovators are characterised by working through "[q]uestions, tensions, uncertainties, relationships, [and] mindset". From the very beginning, Minney felt empowered by her team at People Tree, all of them talented in their fields and convinced that they were doing the right thing for the right reason. Like-minded and passionate about their work for social change, all of them remain excited to solve huge problems. This exchange of ideas within the team produces a positive energy that keeps her engaged in her work.

"I think I'm very optimistic, I'm very positive. I think people become extremely despondent and apathetic if they just understand these huge issues about pollution or environmental destruction, or about human rights abuses. I think it is really important to offer solutions. That was why I think fair trade offers that" (Minney, 2016a).

Childhood and Values

As a child, Minney grew up in Berkshire near London. Her grandfather was a social entrepreneur, and her great-grandfather was a minister. Her family life can be characterized by a mixture of social work, enterprise, the arts, and culture. When Minney was seven years old, her father passed away. This left Minney to be raised by her grandmother and mother, who channeled her grief into voluntary social work. Minney sought to help her mother as much as possible. At this time there were numerous refugees from Uganda who tried to resettle in her hometown. Minney helped her mother to find furniture and clothing and to make homes for them. From an early point in her childhood, Minney gained a keen understanding of cultural diversity and the importance of taking action to help others. Her mother's profession involved working with people who had neurological disorders, such as epilepsy. She would often invite her patients to dinner with the family or hang out on weekends. Minney acclimatized to life with different people whom she viewed as part of the family. These experiences helped her to develop an understanding about inclusion. The entire family shared the same values and ethics based on societal and developmental issues, helping people in need, and always striving for equity and diversity.

Strategy and Vision

When Minney started her social enterprise, she did not have a business plan in place with clear goals and timelines; rather, "the company grew organically" (Minney, 2016a). However, she shared a clear vision amongst her partners, which led her actions and decisions as to which problems they wanted to target: women's rights and environmental issues. To achieve this, she did two things. First, she looked for a fair trade organisation attentive to the rights of women.

This was likely influenced by being brought up in a family of women who understood solidarity as a way of life.[10] Second, she chose a fair trade organisation open to working with new environmental initiatives, environmental technologies, production methods, new organic fibres, and agricultural products. With People Tree, she incorporated new green technologies and developed specialist knowledge for producing organic cotton and environmentally sustainable production practices. However, Minney also learned that innovations require time and that it can take years to realize a vision.

> *I love innovation. It is very exciting to have an idea and then it might take five years to gestate. It might take ten years. Look, it was a dream of mine to put organic cotton on the handlings in Bangladesh. It took me ten years. This is the first season that we have done it. I did not think we would be able to do organic cotton in India. I spent two and a half years when I started People Tree in the beginning, trying to find organic cotton…" (Minney, 2016a)*

Resources – Momentum – Success

Maintaining and growing the business was a constant challenge. Initially the difficulties were because there was so much to learn about product design, setting up new supply chains, developing new distribution and marketing systems, and even building a market for fair trade and organic products. However, the present challenge concerns the huge amount of money that must be spent on research, development, and innovation to bring new organic and ethical textiles to the market. Transforming a piece of conventional land into land suitable for organic cotton is time and capital intensive. The farmer typically carries these costs. Fair trade agreements share these financial responsibilities between farmer and buyer, who also guarantee equitable jobs and

[10] Paradoxically, women support other women's exploitation in the fashion industry: in the 1980s and 1990s, nearly all garments were sewn by women and purchased by women, without any connection between producer and consumer—a trend which continues today.

wages. While conventional fashion brands usually pay their suppliers ninety days after receiving products, fair trade pays fifty percent of each order the moment it is placed. This offers small suppliers the opportunity to finance the production and start working with companies like People Tree. Since it is a constant challenge to access capital and finance, Minney and her team continuously train, develop, and source new capacities. The difficulty of finding resources is shared by many social innovators (Westley et al., 2009, p. 95). However, Minney's most precious and scarce resource is time, which she had to split between her family and business:

> *I think being a mum, you're always juggling responsibilities of managing your family, commitments. I think it was extremely difficult when the children were incredibly young, and I was traveling ten days every month. It's constantly been interesting challenges along the way (Minney, 2016a).*

Despite these challenges, Minney nonetheless feels she experienced some great moments and surprising successes when everything seemed possible, when the productive flow of her work emboldened her to continue defying even her own expectations. Westley et al. similarly described how the feeling of momentum "can build to an intensity that surprises the people who dreamed of such transformation" (Westley et al., 2009, p. 128). For Minney, it was a dream to show fashion people that fair trade fashion was fashionable and not simply clothing.

> *I think business is a challenge, year on year, I'll be honest, but we have had moments when there have been watershed changes. I think one of those was our collaboration with Vogue Japan in 2007 when we worked with four international designers and produced the product through a hundred percent fair trade, organic supply chain. It was an incredible success. We were able to profile ethical fashion probably for the first time internationally. It was picked up by the UK press, the European press. I think it was the first time that fair trade fashion and ethical fashion was on cover pages… It was just a gift. How could you*

get a better opportunity to prove to fashionistas that there was a different way of doing fashion, really? (Minney, 2016a).

Finding Flow and Reflective Learning

Csikszentmihalyi (1997) describes social flow as a result of people finding compatibility between their goals, supporting each other, and having an optimal interaction. Minney experienced this kind of flow while working with her team "in the field", trying to solve problems, activities which she claims galvanized her to continue (Minney, 2016a).

That's an incredible energy, when you are leading a team of people or when you are working with fair trade groups in the field, whether you're in Asia or Africa or Latin America, and really sensing that together, even though you don't share the same culture and language, you can solve huge problems. I think that was extremely exciting... It was a lot of fun (Minney, 2016a).

Minney achieved this state of flow by relying on her intuition in her collaborations with others to produce tangible and positive results, such as the revitalization of land. The processes involved in developing pioneering standards to grow organic cotton required balancing numerous individuals' involvement and careful integration of their various skills and abilities. Minney recognized that the best means of achieving success was to collaborate, and more importantly, reflect on her contributions: to be willing to change roles and adapt her methods to see the project succeed. Minney describes her life as "a journey of learning": She often experienced new situations and circumstances that prompted her to adapt her methods (Minney, 2016a). Learning has become such a natural process for her that even after her success, she still "continue[s] to learn" (Minney, 2016a).

It's always been a journey of learning, trusting my intuition, using my creativity, working with similarly-minded people, people who are really talented in their fields, are very predisposed to doing things but doing them for the right reason (Minney, 2016a).

Scaling Out

In the 1980s, the consumerist lifestyle changed from buying clothing to consuming fast fashion. Fast fashion became the impetus for the global mainstream fashion industry. This new approach to fashion was driven by innovative products; that is, products which constantly follow different fashion trends, the cheapest prices, and the shortest lead times for the production (Barnes & Lea-Greenwood, 2006). Fast fashion exists in opposition to fair trade fashion from companies like People Tree, where lead times are long, prices are comparably high, and many garments include handcrafted pieces based more on style than on fashion trends. The price gap between conventional products and fair trade products has never been more significant than it is today. This price difference keeps fair trade in a niche and limits the business growth opportunities for People Tree. The challenge for fair trade products to compete with conventional products has grown since the 1980s. While consumer awareness about unethical business practices has increased, the low-price points on many of these fast fashion goods have proven difficult for consumers to resist.

After returning to London in 2001, Minney continued her path with fair trade by partnering with new organisations, designers, and talents in different countries and cultures. Today there are more than 200 stores around Europe and an online store selling People Tree fashion and accessories. In 2014, the company was the first fashion company to receive the label of certified fair trade in its entire supply chain from the World Fair Trade Organisation (WFTO). Minney developed a successful niche with a business that has grown robust enough to survive the mainstream competition. She has successfully scaled out her business by replicating and spreading, reaching larger geographic areas and reaching many customers.

The challenges have always been, how do you bring People Tree and the products to scale, into the mainstream? Sadly, fast fashion has become truly global. Twenty years ago, we didn't have fast fashion in Japan. Now fast fashion is everywhere. (Minney, 2016a).

Scaling Deep

Today, many consumers are addicted to the overconsumption of cheap clothing; this puts pressure on them and on businesses because they cannot adopt better business practices. After all, more ethically- and environmentally-friendly business practices would lead to higher sales prices. Gunderson and Holling (2001) claimed that 'rigidity traps' occur in social-ecological systems when the system becomes highly connected, self-reinforcing, and inflexible. The system has lost its capacity to adapt, so change is no longer possible. Because the system cannot adapt anymore, it becomes highly vulnerable to external disturbances through catastrophic disasters. The mainstream fashion business is caught up in a rigidity trap of rapid mass production for the lowest price. Tragedies like the Rana Plaza collapse in 2013, in which hundreds of garment workers were killed when a factory in Bangladesh collapsed, show that the industry is vulnerable to public opinion, since the tragedy significantly damaged the industry's reputation and caused widespread outrage about unethical business practices in the fashion industry. However, such disasters can also elicit change and a re-arrangement of forces and rules in a system. Consumers need to be educated and empowered; they need to understand that they can change the mainstream fashion industry if they change their spending habits. Minney's implicit goal is to free consumers and the industry from this rigidity trap to strive for innovation.

Minney's mission, meanwhile, has been to secure and protect human rights, which she has extended to how her enterprise operates. Her company took on a pioneering role to establish sustainable fashion and develop ethical standards and production capacities. Minney and her team recognised a need to re-educate consumers to recognise the value of a hand-crafted product or a natural organic fibre. To do so, People Tree produced videos and films documenting the human stories behind how their garments were made. Another approach to connect with a

younger audience with fair trade clothing was the cooperation with model and actress Emma Watson to produce a line of fair trade clothing for her age group (Milligan, 2010).

Changing consumer behaviour remains a big challenge, however. Driven by the idea that a tipping point towards sustainable fashion can be reached, Minney's team at People Tree constantly address unsustainable practices and develop solutions. Some mainstream businesses are even noticing this progress and understand that some consumers want a different kind of fashion and are starting to adapt their lines partly towards ethical and organic fashion options—a huge step aided by the pioneering efforts of organisations like People Tree.

> *At the same time, I think a lot of young people certainly, my daughter's age and otherwise, twenty, twenty-five-year-olds, are really beginning to think their closets are full of stuff. They do not really want more stuff. They really want to buy things with meaning and use their purchasing power to really create social change. I think there's a very strong ethical consumer movement coming (Minney, 2016a).*

Minney has always been an activist, but she is an advocate for fair and ethical fashion. To show people the true costs of clothing, she took celebrities, opinion leaders, and journalists into the field and the slums. In 2015, she was featured in the documentary *The True Cost*, directed by Andrew Morgan, which has been translated into more than 30 languages and shown worldwide. Her hope for this film is that it pushes the fashion industry towards change.

The mainstream fashion industry is a resilient system held in a stable regime. Even tragedies like the Rana Plaza incident in 2013, or the thousands of cotton farmers who commit suicide in India every year, have failed to transform this industry. The resilience of the mainstream fashion industry is likely attributable to its massive scale and its financial scope: It is one of the largest industries in the world, characterized by spectacular growth at the beginning of the 21st century, worth more than USD 2.5 trillion, and employs more than 75 million people worldwide (United Nations Economic Commission for Europe, 2018). This industry is embedded

in a landscape of other industries working in a similar way, including the global food industry. Until consumers reach a tipping point and change their purchasing and consumption habits, the industry has little motivation to alter. Echoing Moore et al.'s suggestion that "change must be deeply rooted in people, relationships, communities and cultures [and that it is important] to invest in transforming learning, networks and communities of practice" (Moore et al., 2015, p. 77), Minney believes that "creating little triggers will provide catalysts for change" (Minney, 2016a). As she put it,

> *This is one battle we need to win for the sake of humanity! (Minney, 2016a)*

Scaling Up

In 2015, Minney stepped away from the day-to-day operations at People Tree to work on broader issues in the industry itself, such as "supply chain development, fair trade, and modern slavery" (Minney, 2016a). As a consultant, she offers advice to other industry leaders on how to create mainstream change and how to scale and implement fair trade ideas.

Fair trade has high standards. It is probably the most ethical way to doing business, but it remains a niche in fashion because it is very expensive to practice since the costs of innovation are high. To compensate for the increased costs, garment prices would need to increase, which fast fashion companies are reluctant to do. Until then, however, the industry cannot adapt better business practices. However, many of the World Trade Organisation's fair trade standards are now being incorporated into guidelines like the Ethical Trading Initiative (ETI) base code, including minimum wage becoming a living wage, safe working conditions, and gender equality. The ETI positions itself as a transformative agency that helps the mainstream fashion industry solve regime problems and adopt better business practices. In fact, Minney and her niche enterprise has helped to develop these fair trade standards for ETI. As her fashion business grew, Minney was recognised by Schwab Foundation in 2006 as one of the world's outstanding social entrepreneurs and was awarded "Social Entrepreneur of The Year" in the Edge Upstart Awards.

She has spoken several times at the World Economic Forum's meetings in Davos (Minney, 2016a). She believes that governments are responsible for holding businesses accountable and should follow the UK's 2015 lead by signing the Modern Slavery Act.

> *I'd also like our first world governments to take responsibility for their nation's business practice overseas…I think Canada needs a Modern Slavery Act like the UK, without question, because it's absolutely unacceptable that many countries have signed the UN business and human rights responsibility act and yet no one is enforcing it. Very few governments are enforcing it (Minney, 2016a).*

The Modern Slavery Act in the UK requires medium- to large-sized companies, businesses of thirty-six million British pounds turnovers or more, to report on what they are doing to eradicate slavery from their supply chains. This act means each company is legally obliged to end the use of slavery in their production lines or explain why they are not. Though few governments are enforcing the UN act, Minney hopes her book on modern-day slavery, *Slave to Fashion*, will help spur these countries to action. Published in 2017 and released in tandem with a social marketing campaign to raise awareness about modern slavery in the fashion industry, the book describes the often unseen and insidious global fashion supply chain practices and stresses how straightforward solutions could be.

> *At the same time, as we say that we're disgusted at human trafficking or forced labor, bonded labor, child labor, every government and its businesses, which work hand in hand with government, allowing it to exist (Minney, 2016a).*

Reflections and Limitations

Minney describes herself as "a bit of a perfectionist", "a social entrepreneur", and finally as a pragmatist (Minney, 2016a): She is aware of her goals, but understands that there is not always a direct way to achieve them. The qualities that she believes to be most important to her are

love, creativity, and partnership, and to continually seek these in every endeavour; only then can one achieve success. Indeed, Minney has received many prizes but is always surprised and grateful. Despite these awards and recognition, she remains connected to those she works with and inspire her. To this day, she prefers to stay and work in the villages with her artisans and people. She possesses that unique contradiction that Westley et al. (2009) described as essential for any social innovator: to remain sensible yet aspirational; a quality best captured in Theodore Roosevelt's aphorism to "[k]eep your eyes on the stars, but remember to keep your feet on the ground" (Roosevelt, 1904, n. a.).

> *I remember someone ringing me up and saying, "Would you accept an MBE?" I was like, "Ooh what's an MBE?" Same with World Economic Forum when they gave me a prize as one of the world's outstanding social entrepreneurs and I was just like ... You're just like doing seventy hours a week. You're just like doing, doing, doing, doing, doing. You're just like, "Oh okay." Those are really nice surprises, to be acknowledged" (Minney, 2016a).*[11]

The Possibilities are Endless

Westly et al. described social innovators as those who "find themselves, at the moment of success, standing still and redefining how to get to a new maybe" (Westley et al., 2009, p. 25). Minney has had tremendous success as a social entrepreneur for fair trade fashion. By scaling her mission within the mainstream fashion industry, she has become a systems entrepreneur of sustainable fashion. She received a call, transformed this call into action, overcame resource scarcity, and built momentum for her goals. She is continuously learning and reflecting on her work and her environment. Able to recognise opportunities and possibilities, she has surpassed limits set by others while still knowing when to seek others' help. Experiencing flow, hardship, doubt, and conviction do not in themselves constitute innovation. Nonetheless, social innovation

[11] An MBE is the acronym for The Most Excellent Order of the British Empire. The recognization is a British order of chivalry and is given to outstanding people for their contributions to charitable and welfare organisations.

is measured by the sum of these aspects and how an individual thrives within these experiences. Minney intends to continue her mission by keeping grounded and staying grateful.

> *I've been very lucky that so much has come together. I'm very grateful for that. I'm very grateful for the people that have helped and said yes and made amazing things happen. I think that's what it boils down to. It's about teamwork. It's also about trusting in the faith of something way, way bigger than yourself. You are really just a tool. You're just like a vessel of love and energy and yeah, keep the faith, I guess. (Minney, 2016a).*

Appendix F: Method Overview

Research Study	Method
Chapter 2, Manuscript: How Fashionable are We? Validating the Fashion Interest Scale	The fashion interest scale developed by (Weber, 2015b) was validated using a control group of fashion students living in Ontario. This method was used to evaluate the construct validity through an examination of whether the construct behaved as expected in relation to known groups. Since fashion students are mainly motivated to enrol in a fashion program because of their high interest in fashion and fashion-related activities (Aadland, Dunkelberger, Molnar, & Purcell, 1983; Hodges & Karpova, 2009), they are suited to differentiate from a random sample of people living in Ontario. After receiving Seneca's ethical approval, we contacted 268 fashion students during the winter semester of 2017 to answer the questionnaire. A total of 228 students participated in the study, and all completed the questionnaire. T-tests and ANOVA were used to determine similarities and differences between groups (Boateng et al., 2018). These statistical tests are widely used to analyse differences between groups.

	Finally, the homogeneity of the scale was analysed using a factor analysis (Thurstone, 1931) to investigate the loading of items on a factor (construct) such as “fashion interest.”
Chapter 5, Manuscript: A Structural Impact Analysis of The Fashion System with Regard to Textile Recycling	A structural analysis was conducted to examine the broader system factors that impact recycling. The method is used to analyse direct and indirect influences of impacts in a complex system (Godet, 2010). First, a detailed description of the system was created based on a literature review. Next, I reduced the system’s complexity to its main factors based on my work experience as a leading member of the Ontario Textile Diversion Collaborative (OTDC), a multi-stakeholder group with more than 40 members with different backgrounds all committed to getting textiles out of landfills by making sure they are correctly managed. OTDC had four working groups; I lead the textile recycling group. We conducted facilitated workshops to better understand how to foster textile recycling and develop a theory of change with the group. Based on the knowledge I gained through my work, I was able to perform a systematic qualitative analysis to evaluate the direct influences between the factors using a 4-point Likert scale. Appendix A provides the reasoning for the Matrix of Direct Influences.

	In addition, a MICMAC Analysis (Godet, 2010) was conducted to calculate indirect impacts based on matrix multiplication.
CHAPTER 6: A Circular Economy Approach in the Luxury Fashion Industry: Eileen Fisher Case Study	In November 2017**,** I conducted a field study at Eileen Fisher to explore the possibilities and impacts of take-back programs from a brand owner perspective. I visited the Eileen Fisher office, showroom, and a retail store in New York. Further, I went to the company's headquarters, the factory and the lab store in Irvington. During my visit, I conducted twelve semi-structured in-depth interviews with employees from EF who operate various functions in the company. The role of the interview partners in the company and the questions asked are provided in Appendix C. All interviews were recorded and transcribed. Additionally, respondents were contacted via email and telephone to review answers and provide further clarification. Responses were analysed through deductive content analysis. The final results were reviewed by the interviewees and published in agreement. Additionally, while visiting the recycling factory, an evaluation of its processes was conducted. The mode of inquiry was a variation of a multi-moment recording procedure, a method that assesses practices of a particular operation, occurring at a specific place over a specified duration, capturing what work was completed and in what ways (REFA-Methodenlehre, 1978). The goal of this

	procedure was to compile a detailed description of the actual processing steps of the take-back program to discover challenges. All operational phases of the EF take-back program are provided in a matrix in the manuscript.
Chapters 7 and 8	A literature review was conducted to develop an assessment tool for the requirements of social innovation. Next, I researched promising social innovation cases and used this tool to evaluate them. The cases I chose were: Safia Minney and her social enterprise People Tree**;** Stacy Flynn, who created Evrnu**;** Nicole Rycroft, founder of Canopy**;** and the Ontario Textile Diversion Collaborative (OTDC). OTDC was a participatory research project on social innovation with a not-for-profit partner to tackle textile waste in Ontario. To evaluate the cases**,** I conducted general literature research in public resources such as organisation websites and articles about the potential cases. Finally, I sought first-hand information from the innovators themselves. I developed a semi-structured interview protocol with questions based on cases of social innovators, as described in the book Getting to Maybe by Westley et al. (see Appendix D), to interview Safia Minney. The interview was conducted during the WEAR conference in Toronto in October 2016. For the other cases**,** I found enough material online. Hence, there was no need for a semi-structured interview**.** However, I still had a conversation with Stacy Flynn during the WEAR conference in Toronto in October 2017, and with Nicole

	Rycroft during the WEAR conference in Toronto in October 2018 to complete my research. Finally, I evaluated each case by completing the assessment tool (See section 7.1).