Review

Merchandising for Sustainable Fashion: A Systematic Literature Review

Bo Wu 1,2,†, Xiufen Xie 1,†, Weicheng Ke 1, Huiying Bao 1, Zhilan Duan 1, Zhenyu Jin 1, Xiaoqun Dai 1 and Yan Hong 1,3,*

1 College of Textile and Clothing Engineering, Soochow University, Suzhou 215123, China
2 China-Europe Institute of Fashion, Newton Business School, Shenzhen, 518000, China
3 Department of Computing, The Hong Kong Polytechnic University, Hong Kong 999077, China
* Correspondence: hongyan@suda.edu.cn
† These authors contributed equally to this work.

Abstract: With the emergence of environmental pollution and the excessive waste of resources, the traditional development of the pure pursuit of economic growth has encountered challenges. More and more people are advocating for the concept of sustainable development, which makes sustainable merchandising an urgent necessity. Clothing brands should adhere to the brand sustainability concept and sustainable management in the merchandising process, which can truly improve the competitiveness of the brand. For this reason, a series of studies on sustainable merchandising strategies has been conducted by apparel companies and academia. The existing reviews on sustainability aspects focus on material, recycling, and life-cycle aspects. However, less attention has been paid to the sustainable merchandising aspects of apparel. Therefore, this paper presents a systematic literature review of this topic. We summarize the relevant research on sustainable merchandising from a merchandising perspective and systematically review the relevant theories and cases of sustainable merchandising for the relatively blank field of sustainable brand merchandising for apparel. We have achieved the purpose of integrating the analysis of factors influencing sustainable merchandising, and merchandising strategies. Additionally, on this basis, we discuss how brands can combine social responsibility with merchandising to develop and enjoy the profit space brought by merchandising while assuming and promoting their own brand responsibility. This literature review is based on journal articles, book chapters, and conference papers from the Web of Science (WOS) database and Google Scholar. Through an in-depth analysis of the existing literature, this paper provides an overview of the research topic, the sustainable merchandising of apparel, and discusses the shortcomings of existing merchandising strategies. The findings reveal that there are drawbacks to the current apparel merchandising strategies such as low feasibility, ignoring the driving power of the market, weak consumer awareness, consumer culture, and lack of government intervention and support. This has resulted in the slow development of clothing brands in the sustainable merchandising market. The results of this study provide direction for the development of future sustainable merchandising strategies. It guides policymakers and practitioners to develop relevant strategies for sustainable merchandising in order to provide better market space for sustainable merchandising of apparel.

Keywords: sustainable development; clothing; sustainable merchandising; clothing brand

1. Introduction

With the continuous development of the consumer market, countries around the world are facing increasingly serious problems with regard to environmental pollution and resource waste. In the textile and apparel industry especially, excessive consumption has made this the second most polluting industry in the world. According to the Waste and Resources Action Programme (WRAP), 8% of global greenhouse gases come from
According to the survey, by 2020, 80 billion pieces of clothing will be consumed globally each year. The production of one pair of jeans requires 68 L of water, 1.5 kilowatts of energy, and 141.75 g of chemicals [2], and the results of these resources and energy are quickly thrown into landfills. As a result, the growing consumer demand in the apparel market has put the environment and resource utilization under greater pressure. Excessive consumption by consumers has led to serious problems of resource waste and environmental pollution.

Serious resource waste and environmental pollution problems have prompted researchers to look for effective strategies to address them. Researchers have found that sustainable merchandising of brands can be effective in mitigating resource waste. For example, fast fashion brand Zara, a vertically integrated retailer, has become a mainstream brand in the fast fashion industry through the company’s independent design, production, and distribution. However, as consumers’ environmental awareness awakened and fast fashion brands faced a crisis, Zara launched a series of sustainable merchandising strategies to break such an impasse. For example, Zara has installed clothing recycling bins and developed new technologies to use recycled materials. Zara’s sustainable merchandising has helped to change consumers’ perceptions of fast fashion, improve the brand’s image, and expand its economic benefits. Therefore, sustainable merchandising plays an important role in the apparel industry chain [3,4].

Although the effective implementation of sustainable merchandising is very important, the influencing factors, merchandising model, and merchandising strategy of sustainable merchandising is a very complex issue. This is also due to the numerous links involved in the apparel supply chain and the differences in the perception of consumer groups faced by different brands. The improper use of merchandising strategies will have an impact on clothing brands in terms of reduced profits, lower customer traffic, and even greater environmental pollution. The existing merchandising strategies for sustainable clothing brands mainly include strategies for internal factors and strategies for external factors. The survey found that the most effective way to market sustainable clothing brands is to correctly handle the coordination between consumer needs, environmental protection, and brand interests, and to satisfy consumer needs as much as possible to gain profits.

A sustainable clothing brand merchandising strategy can help brands develop markets, incorporate sustainable branding concepts into specific business operations, and expand a fixed customer base from consumer demand preferences. Brands combine social responsibility with merchandising strategies to create sustainable brand culture, establish a green image of the brand, reduce environmental pollution, and gain special competitive advantages in the market. Currently, the importance of apparel sustainability has made it a hot research topic in this field. Many researchers have conducted in-depth studies on apparel sustainability from different perspectives.

There are many studies on sustainability in apparel in the existing reviews. The research ideas on sustainability in apparel are as follows: (1) Research from the material perspective: This idea focuses on the research of new sustainable materials for apparel. Provin et al. focused on the concept of sustainability and new sustainable materials for textile production for the period 2015–2020 and drew conclusions that contribute to the future of the textile industry through the analysis of 75 articles [5]. (2) Research from the perspective of recycling: This line of thought studies the treatment of garments for recycling and reuse. Xie et al. summarized the existing methods of recycling used clothing and related recycling technologies, discussed their advantages and disadvantages, and provided a systematic review of the recycling of used clothing [6]. (3) Study from a life-cycle perspective: This line of thought examines the environmental impacts of several stages of the garment life cycle. Munasinghe et al. provided LCI data on energy use, water use, and greenhouse gas emissions for a range of materials at all stages of the life cycle. They developed a framework for grouping each material at each life-cycle stage based on energy and water use and greenhouse gas emissions [7]. As can be seen, the existing research mainly pertains to material, recycling, and life-cycle aspects, ignoring the practicality and
effectiveness of merchandising for apparel sustainability. Regarding its practicability as far as clothing brands are concerned, there are two aspects to consider: (1) many processes in the brand are involved in sustainability; and (2) the combination of brand image and social responsibility must be balanced to develop and enjoy the profit margin it brings while assuming social responsibility.

To address this issue, this paper provides a systematic review of the existing research on the sustainable merchandising of apparel. First, we conducted a pre-questionnaire, targeting brand owners of clothing as well as practitioners with certain questions. The questionnaire survey makes this paper more convincing. With the support of data theory, the topics discussed in this paper are more relevant and practical. Then, CiteSpace software is used to analyze the research topic trends of articles related to the topic of sustainable merchandising of apparel and to analyze and summarize the influencing factors and merchandising strategies of sustainable merchandising of apparel. Accordingly, the researchers of this thesis began by searching through the WOS Database and Google Scholar to find relevant research papers and cases on the topic of sustainable merchandising of apparel. Secondly, we summarized the articles that discussed the influencing factors and merchandising strategies of the sustainable merchandising of apparel. Since the CiteSpace software can only analyze articles in the WOS Core Database, we expanded and searched other related articles based on the WOS Core Database articles in the above summary, and used the clustering analysis in the CiteSpace software to analyze the research theme trends of keywords, mapping the apparel sustainable merchandising articles. We analyzed the social value and market value of apparel sustainable merchandising in conjunction with the research theme trends and analyzed and summarized the shortcomings of apparel sustainable merchandising.

The existing reviews related to sustainability have been conducted on the ideas of materials, recycling and the life cycle of clothing [8,9]. Compared with these reviews, the innovation of this study is to summarize and analyze the research and cases related to sustainability from a merchandising perspective, addressing a relatively empty research area on the sustainable merchandising of apparel.

This paper is divided into five chapters. Section 1 is an introduction to analyze the background and research ideas of sustainable merchandising of apparel. Section 2 is based on the relevant literature from the WOS Database and Google Scholar to analyze the influencing factors of sustainable merchandising and analyze the merchandising strategies by exploring the case of the sustainable merchandising of apparel. Section 3 is based on the sustainable merchandising part of the literature from the WOS Core Database in the second section, but expands to search the other related literature, using the cluster analysis in the CiteSpace software to analyze the literature and summarize the current research hotspots of the sustainable merchandising of apparel and the emergent word analysis according to the analyzed graph. Section 4 provides a relevant summary and discussion of the first two sections. We summarize the social and market values of the sustainable merchandising of apparel from three perspectives, corporate, government, and consumer, based on social responsibility and market profit, and present the shortcomings of the study and suggestions for future research. Section 5 is the conclusion, which summarizes the whole article’s content.

2. Influencing Factors, the Current Status of Merchandising Strategies, and Cases of Sustainable Merchandising of Apparel

This chapter explores the case of merchandising strategies for the sustainable merchandising of apparel by searching the existing literature on sustainable merchandising of apparel in the WOS and Google Scholar databases and analyzing the influencing factors of the sustainable merchandising of apparel from the perspective of brands.
2.1. Influencing Factors of Sustainable Merchandising of Apparel

Whether sustainable merchandising of apparel achieves sustainability involves a variety of influencing factors and affects all parts of the apparel supply chain. This has attracted the attention of brands and policymakers and, based on the available literature, the current influencing factors can be grouped into external and internal factors.

2.1.1. External Factors

External factors are mainly expressed as the demand of the apparel market, the government’s policy support, and consumers’ purchasing attitudes and willingness to buy. Gordon et al. explored how sustainable merchandising can be achieved through an analysis of the contributions of three existing merchandising subdisciplines: green merchandising, social merchandising, and critical merchandising. This analysis can help guide the regulation and control of merchandising theory and practice, challenge institutions dominated by merchandising and capitalist systems, and encourage a merchandising system with sustainability as a key objective [10]. Multala et al. explored the sustainability of implementing durability standards in apparel markets. This study showed that clothing libraries, as a form of cooperative consumption and an incentive-compatible way for firms to follow durability standards, not only provide theoretical economic support, but also enhance the environmental and social sustainability of textile markets [11]. To better understand the psychology of sustainable consumption of apparel products, Park aimed to conceptualize, develop, and validate a scale to measure SCCP from the perspective of the average apparel consumer. A content analysis, exploratory factor analysis, and confirmatory factor analysis (MPlus) were used to explore and predict the data, and the scale was tested for reliability and validity with good psychometric properties [12]. Hasan et al. explored the influence of consumer behavior and the awareness of the responsibility of clothing retailers on the intention of purchasing organic cotton clothing (OCC). The development of OCC in the fashion industry can play an important role in mitigating environmental pollution and creating new business opportunities around green clothing. OCC is important for the implementation of the sustainable development of the apparel industry in developing countries [13]. Sun et al. explored the configuration of three dimensions of sustainable merchandising that may affect customer assets. They surveyed young Chinese and Korean customers of mainstream sportswear brands to explore the factors that influence the perception of customer assets and to compare the impact of cultural differences [14]. Kleinhucke et al. discussed the factors affecting mass-market sustainability in terms of consumers, social environment, and industrial production, using apparel as an example [15]. Kumagai et al. conducted a study on consumer purchasing behavior based on product sustainability and investigated consumers’ brand attitudes and purchase intentions toward sustainable plastic clothing. The results showed that sustainable plastic clothing improved consumers’ brand attitudes and indirectly influenced purchase intentions [16].

A synthesis of the above literature shows that the external influencing factors of the sustainable merchandising of apparel are characterized by guidance and encouragement. The sustainable merchandising of apparel is guided by markets, policies, and consumers to make the merchandising of apparel more environmentally friendly and economical. However, the above external influencing factors do not fully determine the actual implementation of sustainable merchandising behaviors, but also require the support of internal brand factors.

2.1.2. Internal Factors

Compared to the guiding role of external influences, the internal influences of apparel brands play a greater role in sustainable merchandising. Internal influencing factors mainly involve various aspects of apparel, such as design, staff, product materials, production, merchandising, etc. Sustainability in the textile and apparel industry is seen as an important issue for brand development. Many brands reveal their concern for the protection of people and the environment and adopt an ecofriendly way of communication.
imaki et al. proposed to rethink and redesign the related business by providing some outlined design strategies in the field of textiles and apparel. This design strategy facilitates the merchandising and selling of products, promotes sustainable merchandising, and continuously provides better opportunities for sustainability by assessing the level of consumer interest in these design strategies and discussing the new value created by these design approaches [17]. Avadanei et al. introduced a new training toolkit for companies in the textile and apparel industry (especially SMEs). It improves the professionalism of brand staff and continuously develops new skills for this new business type of sustainable merchandising, contributing to the systematic vocational training of textile and apparel industry personnel [18]. Abreu et al. showed through their study that although the price is the most important factor in merchandising, there is also a large market for products and practices based on a genuine commitment to the natural environment and social issues [19].

Through the above literature, the summary found that the sustainable merchandising of apparel needs to start from multiple places, linking multiple parts of the apparel brand with sustainability. It not only fully considers all aspects of apparel production, but also reduces environmental, economic, and social pressures, and increases the way brands communicate with consumers, improving product sustainability while expanding the scope of the product in the apparel market.

2.2. Sustainable Merchandising Strategy for Apparel

Apparel brands can change the internal and external environment of their brands through a variety of sustainable merchandising strategies. Currently, apparel brands are actively transforming their original unsustainable business models and development concepts and striving to achieve sustainable development by shifting from a single-benefit to a quality-benefit model. According to the existing literature, we have analyzed the sustainable merchandising strategies for apparel, including internal intangible factors, external tangible factors, and consumers’ willingness to buy.

2.2.1. Internal Intangible Factors

Internal intangible factors include both personal awareness and subjective norms, which have a significant positive impact on consumers’ purchase intentions, behavior, and satisfaction. The key to the success or failure of the sustainable merchandising of apparel lies in whether it is recognized by consumers who have transformed their simple instinctive needs into strong spiritual and cultural consumption needs.

The personal consciousness aspect of this internal intangible factor is manifested in the creation of a sustainable image for the brand, which enhances consumer recognition, and the use of various merchandising approaches to strengthen the brand’s and consumer’s awareness of sustainability. Researchers have, therefore, investigated the personal awareness aspect of sustainable merchandising. For example, Makasi et al. extended the existing knowledge on merchandising strategies in the context of globalization of the Zimbabwean property sector and empirically argued for a new approach to developing and implementing competitive merchandising strategies. The results of the study will lead to the development of more competitive merchandising strategies in the property sector in developing economies [20]. Su et al. conducted a study on the factors influencing consumer purchase behavior of millennials in China and the United States. The results of the study showed that the younger generation of consumers developed a strong and active interest in knowledge about apparel sustainability, which in turn, had a strong influence on purchase intentions [21]. In addition, a cross-cultural comparative analysis revealed differences in knowledge and values around apparel sustainability between Chinese and American millennial consumers.

The subjective-norm aspect of internal intangible factors is mainly manifested in the brand’s enhancement of soft publicity methods, positive guidance of subjective norms, and active participation in public welfare, thereby increasing the brand’s sense of social responsibility. By summarizing and analyzing the relevant literature and materials, the
sustainable merchandising and publicity cases of each brand were summarized, and the results are shown in Table 1.

Table 1. Examples of sustainable brand merchandising campaigns.

<table>
<thead>
<tr>
<th>Brand/Company</th>
<th>Merchandising Theme</th>
<th>Merchandising Content</th>
<th>Information Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levi</td>
<td>Buy Better, Wear Longer</td>
<td>In 2021, the brand’s campaign focused on creating high-quality clothing that can be worn not only for a few weeks or a month, but for generations. To do this, the brand employed sustainable production practices and invested in alternative materials and technologies. The brand campaign chose to spend a significant amount of merchandising dollars on a hashtag environmental campaign with sustainable demand. Their hashtag asked people to make small changes in their daily lives to fight the global water crisis. People in over 1300 cities around the world took part in the Levi Water Challenge in 2012 [22].</td>
<td><a href="https://sustainabilitymattersdaily.com/creative-sustainable-fashion-marketing-campaigns/#1-levis-buy-better-wear-longer">https://sustainabilitymattersdaily.com/creative-sustainable-fashion-marketing-campaigns/#1-levis-buy-better-wear-longer</a>, accessed on 3 May 2022</td>
</tr>
<tr>
<td>Water &gt; Less</td>
<td></td>
<td>In 2015, the British luxury women’s fashion brand launched an awareness campaign. It was created to get people thinking about the hidden costs of low-quality, mass-produced clothing. On a big shopping day, Patagonia’s full-page ad featured a line that said, “Don’t Buy This Jacket. “By doing so, Patagonia was trying to convey its message of “Buy Less”. The brand used “reverse psychology” to find a merchandising campaign that applauded the minimalist lifestyle. They claim they want to “solve the problem of consumerism”.</td>
<td><a href="https://the-dots.com/projects/jigsaw-for-life-not-landfill-110733">https://the-dots.com/projects/jigsaw-for-life-not-landfill-110733</a>, accessed on 5 May 2022</td>
</tr>
<tr>
<td>Jigsaw</td>
<td>For Life, Not Landfill</td>
<td>In 2020, Spanish fashion brand Adolfo Dominguez showcased old clothes in a merchandising campaign focused on sustainability. It encouraged people to buy timeless and durable clothes instead of buying fast fashion. The brand asked customers to return 20- to 40-year-old clothes. These clothes are refurbished and transformed into trendy and more wearable clothes [23]. Los Angeles-based brand Reformation has set a new standard for sustainable clothing merchandising using an edgy slogan. The brand has found clever ways to insert a sustainability narrative that is jargon-free at all times and backed by quantifiable data. The brand lists the carbon dioxide, water, and waste saved by each product sold on the Reformation website.</td>
<td><a href="https://www.patagonia.com/home/">https://www.patagonia.com/home/</a>, accessed on 3 May 2022</td>
</tr>
<tr>
<td>Patagonia</td>
<td>Don’t Buy this Jacket</td>
<td></td>
<td>Textile sustainability: A Brazilian etiquette issue</td>
</tr>
<tr>
<td>Adolfo Dominguez</td>
<td>Old Clothes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reformation</td>
<td>Being naked is the most sustainable option</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1. Cont.

<table>
<thead>
<tr>
<th>Brand/Company</th>
<th>Merchandising Theme</th>
<th>Merchandising Content</th>
<th>Information Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stella McCartney</td>
<td>Stella × Greenpeace</td>
<td>Stella McCartney exclusively released two t-shirts and two sweatshirts supporting Greenpeace’s campaign to stop deforestation in the Amazon fueled by industrial agriculture and meat production. All garments are made from a soft, certified organic cotton that is kinder to Mother Earth, grown without the use of harmful chemicals, pesticides, and fertilizers that could threaten fellow creatures and local communities. The REMADE studio in East London was transformed into an experiential destination to make fashion consumers rethink their buying habits, where visitors of all ages could get a glimpse of Rayburn’s design and production techniques based on the concept of “remade, reduced and recycled”, from military parachutes and tents to handcrafted items. UK sister brands Togetherband and Bottletop educate consumers in their merchandising campaigns so that they can make more informed decisions about which products to buy when they need them. Both brands prefer to ask gift recipients ahead of time what they like to use most and give gifts in compostable or recyclable packaging to offset carbon emissions [24].</td>
<td></td>
</tr>
<tr>
<td>RE MADE</td>
<td>remade, reduced and recycled</td>
<td></td>
<td>REMADE2020 IMPACT REPORT:The Circular Economy Institute</td>
</tr>
<tr>
<td>Togetherband and Bottletop</td>
<td>Sustainable merchandising is the merchandising of sustainable products in a sustainable way</td>
<td></td>
<td><a href="https://www.voguebusiness.com/sustainability/how-can-fashion-make-marketing-more-sustainable">https://www.voguebusiness.com/sustainability/how-can-fashion-make-marketing-more-sustainable</a>, accessed on 13 May 2022</td>
</tr>
</tbody>
</table>

In summary, it can be said that the sustainable merchandising strategy for apparel is to emphasize environmental protection, safety, health, etc., and to design promotional activities based on consumer psychology. The most important of these is using a variety of means to carry out comprehensive publicity, enhancing social as well as consumer recognition from different aspects, and enhancing consumer purchase intention, purchase behavior, and satisfaction.

2.2.2. External Tangible Factors

External tangible factors include research, development, design, production, manufacturing, distribution, retail, use, and disposal. Clothing brands should follow the principle of sustainability in all aspects of their supply chains, which contain a series of interacting activities from sourcing, production, transportation, distribution and storage. In terms of external tangible factors, brands need to handle each segment sustainably. Therefore, each apparel brand has a corresponding sustainable merchandising strategy for external tangible factors, which can be seen in Table 2.
### Table 2. Brand merchandising sustainable material product examples.

<table>
<thead>
<tr>
<th>Brand/Company</th>
<th>Merchandising Theme</th>
<th>Merchandising Content</th>
<th>Information Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Everlane</td>
<td>Warming jackets</td>
<td>Outdoor fashion brand Everlane makes down jackets from recycled plastic water bottles. A jacket is made from 16 discarded bottles. Everlane promotes itself through this campaign. WWF-Australia bought a giant fishing net and upcycled it 100%. Together with Vision Direct, they developed the Everlon brand.</td>
<td><a href="https://www.youtube.com/watch?v=3wy6NmxjVMg">https://www.youtube.com/watch?v=3wy6NmxjVMg</a>, accessed on 13 May 2022</td>
</tr>
<tr>
<td>Vision Direct</td>
<td>ReefCycle sunglasses</td>
<td>ReefCycle sunglasses collection: they are made from recycled gillnets and part of this deal goes to saving animal species in Australia. In 2014, H&amp;M launched a collection designed for women, men, and children, using greener materials such as recycled and discarded textiles that were produced using more sustainable processes. The main goal was to minimize the use of energy and water. Birdsong launched a Patreon that allowed customers to pay a monthly subscription fee to support the brand in exchange for blog posts and exclusive discounts. This has further changed the relationship between the customer and the brand from one of a business-centric interest to one of a partnership centered on education and shared values. Recent resources include sustainable garment care, transparent costing, and recycled polyester [25].</td>
<td><a href="https://arisecollective.com/pages/reefcycle">https://arisecollective.com/pages/reefcycle</a>, accessed on 14 May 2022</td>
</tr>
<tr>
<td>H&amp;M</td>
<td>Go Green, Wear Blue</td>
<td>In 2014, H&amp;M launched a collection designed for women, men, and children, using greener materials such as recycled and discarded textiles that were produced using more sustainable processes. The main goal was to minimize the use of energy and water. Birdsong launched a Patreon that allowed customers to pay a monthly subscription fee to support the brand in exchange for blog posts and exclusive discounts. This has further changed the relationship between the customer and the brand from one of a business-centric interest to one of a partnership centered on education and shared values. Recent resources include sustainable garment care, transparent costing, and recycled polyester [25].</td>
<td><a href="https://about.hm.com/en_us/news/conscious-denim-hm-jeanologia-collection.html">https://about.hm.com/en_us/news/conscious-denim-hm-jeanologia-collection.html</a>, accessed on 13 May 2022</td>
</tr>
<tr>
<td>Birdsong</td>
<td>The most sustainable messages educate consumers rather than peddling products</td>
<td>Footwear brand Po-Zu promotes the use of biodegradable materials such as organic cotton and pinatex (leather made from pineapple leaf fibers), hand-stitched using a glue-free manufacturing process. The brand was founded by Sven Segal, whose signature coconut-shell footbed has a high level of comfort. The Allbirds Tree Collection was launched with shoes made from three natural materials: eucalyptus, sugar cane and castor seed oil, corresponding to the upper material, sole, and insole, respectively. One of the highlights of the Allbirds Tree Collection is that the upper material is woven from eucalyptus fibers from South African forests. It is a naturally recyclable material that uses significantly less water and reduces carbon emissions compared to cotton during the growing and manufacturing process.</td>
<td><a href="https://www.voguebusiness.com/sustainability/how-can-fashion-make-marketing-more-sustainable">https://www.voguebusiness.com/sustainability/how-can-fashion-make-marketing-more-sustainable</a>, accessed on 13 May 2022</td>
</tr>
</tbody>
</table>
Table 2. Cont.

<table>
<thead>
<tr>
<th>Brand/Company</th>
<th>Merchandising Theme</th>
<th>Merchandising Content</th>
<th>Information Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANGAIA</td>
<td>PANGAIA × Haroshi</td>
<td>PANGAIA teamed up with the Japanese artist Haroshi to create a limited capsule collection featuring four different and unique prints of artwork by Haroshi, printed on the PANGAIA seaweed fiber t-shirt. The PANGAIA seaweed t-shirt is made from saltwater seaweed fiber and organic cotton, treated with natural peppermint oil to keep it fresher for longer and reduce water waste by up to 3000 L over its lifetime (compared to a regular t-shirt).</td>
<td><a href="https://pangaia.com/blogs/editorials/haroshi">https://pangaia.com/blogs/editorials/haroshi</a>, accessed on 12 May 2022</td>
</tr>
</tbody>
</table>

In addition to the above sustainable merchandising strategies of each brand, scholars have also made relevant studies on these aspects. With the booming development of the Internet and artificial intelligence, the issue of sustainability has become increasingly prominent in the development and distribution of smart clothing. Li et al. explored the challenges faced in the supply of raw materials, design, manufacturing, storage, logistics, and recycling from the perspective of the industrial chain. In response to these challenges, some countermeasures are proposed in terms of design, raw materials, and supply-chain management, taking into account the characteristics of smart garments and the future trends of the apparel industry [26].

In summary, the sustainable merchandising strategies of a brand in terms of external tangible factors can be sustainable with regard to all aspects, thereby extending the life cycle of the garment. At the same time, the brand can choose to design in collaboration with consumers, follow the concept of sustainability, and create environmentally friendly products to meet consumers’ purchasing needs, which can also better enhance consumers’ sense of identity.

2.2.3. Consumers’ Willingness to Buy

The consumer purchase intention aspect is mainly expressed in the interrelationship between purchase intention, purchase behavior, and satisfaction. It is necessary to pay attention to the inner connection of the three, using dynamic thinking, a forward-looking vision, timely updates on the merchandising concept, and innovative merchandising methods to fully obtain the trust and support of consumers. For example, Jung et al. focused on sustainable merchandising activities and their performance in traditional apparel markets. The results of the study showed that sustainable activities in traditional apparel markets have a positive impact on brand image, trust, and satisfaction [27]. Sustainable merchandising focuses on environmental quality and social welfare while promoting environmentally friendly products. Dalen et al. studied the effects of advertising visualization and advertising statements on brand attitudes, purchase intentions, perceived sustainability, brand trust, and online engagement of apparel brands [28]. McNeill et al. explored fashion consumers’ attitudes toward sustainable products, ethical fashion purchases, and their subsequent behavior. Applying a developmental theory model to the fashion context, the study found three types of fashion consumers: “Self” consumers, concerned with hedonistic needs, “Social” consumers, concerned with social image, and “Sacrifice” consumers, who strive to reduce their impact on the world. [29]. Trivedi et al. presented a conceptual framework of sustainability strategies that companies must adopt. This framework became an important position for companies to meet consumer expectations without compromising business values and identified four main sustainable merchandising strategies to integrate into business practices [30].
In summary, apparel brands need to have an eye for brand internationalization strategies, learn from the relevant experiences of successful sustainable merchandising of apparel, and improve the core values of the brand. Brands should aim for smooth upward development [31,32], take the right sustainable values as their direction, and use quality products and services as the carrier to build a good brand image. This will lead to transforming the current brand’s supply-chain efforts into a sustainable value ring, combining environmental improvement with production benefits, and building a truly sustainable apparel brand.

3. Literature Collection and Descriptive Analysis

The previous section focused on analyzing the influencing factors and strategies of the sustainable merchandising of apparel by summarizing the literature related to the sustainable merchandising of apparel. Since the CiteSpace software is only compatible with the WOS Core Database literature, this chapter is based on the literature related to the topic of apparel sustainable merchandising in the WOS Core Database that was already retrieved in Chapter 2, and additionally, expands on this research to retrieve other apparel sustainable merchandising-related articles from the WOS Core Database. CiteSpace software’s cluster analysis was used to analyze these two parts of the literature, analyzing the apparel sustainable merchandising keyword graph and keyword burst graph to find and describe the new trends of apparel sustainable merchandising.

3.1. Literature Collection

First, we selected appropriate topics. For these topics, relevant publications, including journal articles, book chapters, and conference papers, were screened from the WOS Core Database, thus constituting a large amount of literature data. This process helps to construct a structured, detailed, and effective literature review that can provide valuable suggestions for writing future reviews.

The literature query used Boolean operators and structured search strings for keyword searches. Keywords were selected based on relevance to the topic of the sustainable merchandising of apparel, as well as the most commonly used words in research papers and the words used by researchers. Searches were conducted using the following strings:

[clothing OR garment OR apparel] AND [sustainable OR sustainability OR sustainable development] AND [merchandising OR merchandising planning OR merchandising policy OR merchandising strategy OR merchandising tactics] AND [brand OR origin OR brand merchandising OR brand merchandising strategy].

The search revealed that different scholars have conducted relevant studies on areas related to sustainable merchandising of apparel [33–36]. For example, in their study, Colasante et al. assessed consumers’ attitudes toward the fashion industry, particularly toward the bio- and circular economy. The results showed that a wrong assessment of sustainability led to different consumer attitudes toward the bio- and circular economy. In fact, respondents were willing to buy bio-based clothing as well as other bio-based products [37]. Gopalakrishnan et al. examined the merchandising strategies of apparel thrift stores, explored the challenges and opportunities they face, and suggested potential strategies for merchandising the apparel in thrift stores. The study was one of the early attempts at a business model for secondhand fashion stores, a form of collaborative consumption in a fashion context. The study helped to promote sustainable merchandising of secondhand fashion stores in the fashion industry [38].

Next, we screened the collected literature. After conducting several in-depth literature reviews to form a detailed and accurate literature review, we excluded the research literature that had the same data and similar questions, as well as the literature that had duplicate studies by the same authors, the sustainable merchandising literature that was not related to apparel, studies that did not involve apparel, and articles that were consistent with the central theme but were not coherent. Table 3 summarizes the conditions for inclusion and exclusion of the literature.
Finally, a total of 165 articles were generated from the WOS Core Database by search strings. Ineligible articles were excluded based on inclusion and exclusion conditions. The final number of studies included in the sample of studies on sustainable merchandising of apparel was 165.

3.2. Analysis of Article Trends and Research Theme Descriptions

3.2.1. Research Theme Trends

The keyword analysis graph of the sustainable merchandising of clothing screened by the WOS Core Database is shown in Figure 1. The time span is 1980–2022, the search deadline is 10 May 2021, the search type is sustainable merchandising of clothing, the document type is the article, and the search topic is sustainable merchandising of clothing.

The keyword clustering graph of cluster centrality is shown in Figure 1 and the keywords with the serial numbers in front are the cluster names. It can be seen that the largest cluster is “customer satisfaction”, and the cluster of this term is the darkest in color, dark green, and the largest in shape. According to this, the core research theme in the field of sustainable merchandising of apparel is customer satisfaction. Due to the development of society and the economy, brands and consumers have also started to pay more attention to customer satisfaction, which is part of the sustainable merchandising strategy for apparel. The cluster most associated with “customer satisfaction” is “environmental awareness”,...
which is also the second highest-ranked cluster. In recent years, more and more researchers are focusing on environmental protection, and this graph also shows that customer satisfaction and environmental awareness will be the focus of future research. The third ranking in the cluster is “style consultancy service”. According to the analysis of the above chart, the personal needs service for clothing is receiving more and more attention. In addition, Figure 1 shows that this keyword trend is closely related to keywords such as identity and perception. This indicates that researchers are now focusing on sustainable merchandising of apparel while paying more attention to consumer preference research, and focusing on listening to consumers and paying more attention to their needs. The fourth-ranked cluster is “fashion”, which shows that fashion design is also a hot topic in the research of sustainable merchandising of apparel. Fashion design can increase consumers’ experience and enhance their purchase satisfaction.

3.2.2. Trend Analysis of Emergent Words

The analysis of the 12 emergent keywords of the literature on sustainable merchandising of clothing in Figure 2 shows that, among the keywords of the literature on sustainable merchandising of clothing, the initial year in which the term “apparel” was mentioned was 2015. After 2018, the term is rarely mentioned in the keywords of the literature related to sustainable merchandising of apparel. The terms “circular economy”, “business model”, “design”, “clothing consumption”, and “comparative advantage” emerge as key buzzwords in the literature on sustainable merchandising of clothing between 2019 and 2020. This also indicates that “circular economy”, “business model”, “design”, “clothing consumption”, and “comparative advantage” will be the key focus of researchers in 2019–2020. According to the chart below, “corporate social responsibility”, “customer equity”, “customer satisfaction”, and “fashion consumption” will be the emerging words in 2020–2022, and the above four research themes will become the new research themes.

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Year</th>
<th>Strength</th>
<th>Begin</th>
<th>End</th>
<th>2003 - 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>apparel</td>
<td>2003</td>
<td>0.94</td>
<td>2015</td>
<td>2018</td>
<td></td>
</tr>
<tr>
<td>environmental concern</td>
<td>2003</td>
<td>0.53</td>
<td>2015</td>
<td>2019</td>
<td></td>
</tr>
<tr>
<td>sustainable consumption</td>
<td>2003</td>
<td>1.32</td>
<td>2018</td>
<td>2019</td>
<td></td>
</tr>
<tr>
<td>circular economy</td>
<td>2003</td>
<td>1.12</td>
<td>2019</td>
<td>2020</td>
<td></td>
</tr>
<tr>
<td>business model</td>
<td>2003</td>
<td>1.12</td>
<td>2019</td>
<td>2020</td>
<td></td>
</tr>
<tr>
<td>design</td>
<td>2003</td>
<td>0.74</td>
<td>2019</td>
<td>2020</td>
<td></td>
</tr>
<tr>
<td>clothing consumption</td>
<td>2003</td>
<td>0.74</td>
<td>2019</td>
<td>2020</td>
<td></td>
</tr>
<tr>
<td>comparative advantage</td>
<td>2003</td>
<td>0.74</td>
<td>2019</td>
<td>2020</td>
<td></td>
</tr>
<tr>
<td>corporate social responsibility</td>
<td>2003</td>
<td>2.03</td>
<td>2020</td>
<td>2022</td>
<td></td>
</tr>
<tr>
<td>customer equity</td>
<td>2003</td>
<td>0.8</td>
<td>2020</td>
<td>2022</td>
<td></td>
</tr>
<tr>
<td>customer satisfaction</td>
<td>2003</td>
<td>0.8</td>
<td>2020</td>
<td>2022</td>
<td></td>
</tr>
<tr>
<td>fashion consumption</td>
<td>2003</td>
<td>0.8</td>
<td>2020</td>
<td>2022</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Keyword emergence analysis of the 165 pieces of literature related to sustainable merchandising of apparel.

4. Analysis of Results and Discussion

This chapter qualitatively analyzes sustainable merchandising influence factors and merchandising strategy drawbacks using 165 articles. Based on these screened, relevant references, a summary analysis of how brands can maximize profits based on the combination of social responsibility and merchandising, and the perception of the sustainability of brands and their social and market values are presented from a merchandising perspective.

The differences in awareness of sustainable merchandising among brands in the apparel industry have led to the differentiation of sustainable merchandising actions by brands in the market. This also shows the importance of sustainability awareness and the fact that sustainability awareness is the basis for sustainable merchandising by brands.
Sustainable merchandising of brands with government intervention and support can lead to significant improvement and enhancement of the social and market value of brands.

4.1. Clothing Brands’ Understanding of Sustainability in Merchandising

The sustainability awareness with regard to different parts of the apparel industry has an important role in the research and practice of sustainable development. Sustainability is oriented to different product segments, and the development of different production segments is largely guided by consumer awareness. Therefore, sustainability awareness is the primary consideration in each product segment, and sustainability awareness in the brand merchandising segment is also crucial. Based on the existing literature, this subsection analyzes the perception of sustainability in merchandising strategies in apparel brands. It includes the perceptions and actions of producers and governments on sustainable merchandising influencing factors, consumers’ perceptions of sustainable merchandising strategies, and the social and market values that producers, governments, and consumers bring to clothing brands by the way they act.

4.1.1. The Social Value of Sustainable Merchandising of Apparel

This paper summarizes the research related to the influencing factors and merchandising strategies of sustainable merchandising. The findings suggest that government policy support has a crucial role in the sustainable merchandising of apparel. For example, the government implements durability standards in the apparel market. Additionally, clothing libraries as a form of cooperative consumption and incentive-compatible ways for firms to follow durability standards not only provide economic theoretical support, but also strengthen the environmental and social sustainability of textile markets [11]. Such government intervention and support can effectively improve the future development of sustainable merchandising of apparel.

Guided by the government, producers have also taken corresponding steps toward the sustainable merchandising of apparel. For example, among the external influencing factors of sustainable merchandising, apparel brands explore the differential impact of environmental awareness and fashion opinions on consumers’ willingness to purchase apparel products made from sustainable fabric [40]. Brands have guided apparel designers and tailors to practice sustainable fashion to the maximum extent possible in the design and tailoring segments, incorporating sustainable fashion concepts throughout [41]. Apparel retailers communicate the sustainable consumption agenda to customers in their stores as a way to enhance the role that can be played in sustainable consumption [42]. Furthermore, both SMEs and large corporations should maintain the concept of corporate social responsibility (CSR) to protect employees through legal obligations such as wages and benefits, safe production, gender equality, and promotion. In addition, CSR activities should be related to targeted interests, especially the need for local communities to come together to address social issues [43]. Among the internal influencing factors of sustainable merchandising, some clothing brands realize that consumers’ personal norms, social norms, and environmental awareness are key factors influencing sustainable fashion consumption [44]. Producers combine their ecological concepts and publicity to create an eco-fashion brand image [45]. Producers use the characteristics of celebrity endorsers (ethical, moral, image, etc.) to promote their brand as a way to achieve awareness, attitude, and willingness to buy a product, selling a sustainable brand [46]. The better the producer’s clothing brand equity (i.e., brand awareness, brand image), the higher the customer response (willingness to pay a price premium, customer loyalty). In addition, the indirect association between basic social media merchandising activities and customer responses can be moderated through brand equity [47]. Producers’ initiatives related to sustainable merchandising of clothing brands also drive consumers’ interest and actions toward the sustainable merchandising of clothing.

With the promotion of producers, consumers have a new awareness and pay attention to the sustainable merchandising of apparel. If a product can provide enough aesthetic,
Sustainability benefits to meet the needs and desires of consumers, then consumers will buy that brand product. This shows that consumers are not only concerned about environmental, social, and ethical benefits, but also consider the aesthetic, functional, symbolic, and financial value of clothing [48]. In addition, research has shown that different consumer self-perceptions have different effects on fashion choices, and the segmentation of apparel products has different degrees of influence on purchase intentions [49].

4.1.2. The Market Value of Sustainable Merchandising of Apparel

The government has also introduced policies in sustainable merchandising of apparel as a way to support producers’ practices and actions in sustainable merchandising, in order for producers to use sustainable merchandising to improve their market-driven capabilities and to develop and grow the profit space that comes with the sustainable merchandising of apparel. However, there is a gap in the development of government strategies and policies for sustainable apparel merchandising. If policymakers can develop appropriate policies, then consumer awareness of sustainable fashion will increase and the purchasing power of sustainable products will grow [50].

The introduction of the concept of sustainability by producers in terms of technology and the use of sustainable technologies can increase the competitive advantage of companies in the process of selling their products [51]. Fashion brands use the Higgs Index to improve information transparency and, thus, increase environmental concerns, brand trust, willingness to act environmentally friendly, and willingness to buy. The analysis shows that corporate transparency has a positive impact on environmental concerns, brand trust, and willingness to behave in an environmentally friendly way, as well as on market acceptance [52]. In addition, Chinese producers use social media as a medium to inform consumers about the sustainable clothing of apparel brands sold through social media vendors as a way to increase consumers’ willingness to purchase [53].

The lack of government support and guidance in the sustainable merchandising of apparel has led to a lack of standardization in the sustainable merchandising market, resulting in weak consumer awareness of sustainability in this area. Producers’ initiatives in the sustainable merchandising of apparel have increased the market space for sustainable products, enjoying their profit space while promoting a sustainable brand image.

4.2. Shortcomings of Sustainable Merchandising Strategies for Apparel

The social and market value of sustainable apparel merchandising has made more and more apparel practitioners and government departments aware of the need for sustainability, and producers are actively promoting corresponding strategies and measures. In this section, we will discuss the shortcomings of sustainable brand merchandising strategies for apparel in terms of both internal intangible factors and external tangible factors.

4.2.1. Shortcomings of Merchandising Strategies for Internal Intangible Factors

Studies have shown that in the internal intangible merchandising strategy of apparel sustainable merchandising, producers effectively integrate sustainability throughout the design, research, development, production, manufacturing, packaging, and retailing of apparel [54–56]. By insisting that practices are consistent with the brand promise and by integrating stakeholders into value creation, the right values are communicated at the social, practical, environmental, and cultural levels to expand the brand’s reach and enable effective communication of the brand’s sustainable image, thus guiding consumers’ sustainable consumption. However, there are some drawbacks to sustainable merchandising communications: the lack of transparency, openness, and environmental standards for the sustainability of brand products.

We also note that the process of sustainable merchandising of apparel is carried out for both the personal awareness of consumers and the subjective regulation of the brand’s own image, but consumers are susceptible to the false advertising of some brands. In this regard, is it possible for government staff to develop standards and strategies for
sustainable merchandising within the apparel industry? How can consumers benefit from these standards and use them to identify the authenticity of the sustainable merchandising of apparel? Can experts in the industry suggest more feasible merchandising strategies for the sustainable development of apparel brands, instead of allowing consumers to passively learn about sustainability from producers? While these merchandising strategies provide apparel brands with information on factors that influence consumer demand to create a strong and reliable market position, can policymakers set clear standards to regulate the transparency and integrity of information about sustainable products in apparel sustainability merchandising? This would increase consumer awareness of sustainable apparel merchandising.

4.2.2. Shortcomings of Merchandising Strategies for External Tangible Factors

Studies have shown that the external tangible factors of the sustainable merchandising of apparel lie in developing unique products, following the four aspects of sustainable design, including optimal manufacturing to minimize pollution and waste, efficient transportation distribution, green and energy-saving stores, and promoting low-pollution washing and diversifying the disposal of used clothes. Clothing brands are practicing the concept of sustainable development in all aspects, but there is no shortage of sustainable merchandising that is being abused. Some brands market themselves under the banner of “sustainability” but do not really implement the focus of sustainable merchandising, which is to implement the concept of sustainability without violating the principles of sustainability. However, these brands continue using the sustainability label as a merchandising tool, actually increasing the volume of shipments while they pretend to stimulate people to consume in a relatively ethical way. In other words: the fashion industry needs to reduce production and promote moderation in consumption. Some brands have even turned their brand merchandising into an act of “greenwashing”. “Greenwashing”, as the name suggests, refers to the use of false and exaggerated means to promote and prove to consumers the greenness and environmental friendliness of their products. The proliferation of “greenwashing” merchandising has led to consumer buying ambivalence, making it difficult for consumers to distinguish between real and fake sustainable products. This is also a challenge for the sustainable production and merchandising of clothing.

Therefore, what kind of rules will policymakers set to efficiently allocate transportation in the business? Can industry experts develop a program standard to regulate the carbon emissions generated during garment production? The wearability of clothing is very important in the design process, and making clothing more wearable is truly sustainable for brands. Thus, how to design clothes that are fashionable, wearable, and sustainable? How can we optimize the carbon emissions of clothing from design to production and from retail to reprocessing? Do manufacturers take into account the disposal of used garments while merchandising sustainable brands? If this issue is taken into account, is the final solution for used clothing truly sustainable? Are there real laws and regulations governing the market to prevent “greenwashing” products? Are the sustainability statements of some products vague, and are they “greenwashing” products? If so, are there industry standards that can be relied upon? Our producers, researchers, and policymakers need to think deeply about these issues and study them.

4.3. Research Shortcomings and Recommendations

This paper concentrates on case studies as a way to summarize and analyze the issue of sustainable merchandising of apparel. Transferring the results of such studies from one context to another is not applicable, and there is no one sustainability rule that can be applied to studies in any context. In addition, there is variability in brands, and the application of merchandising strategies is not directly transferable from one brand to another. Individual differences need to be analyzed.

This study provides a summary analysis of the factors influencing sustainable merchandising of apparel, cases related to merchandising strategies, and a summary overview
of the existing literature. It includes a descriptive analysis of research themes and an emergent word analysis. Through the network-visualization keyword clustering mapping in Figure 1, the analysis shows that the future research trend lies in customer satisfaction for the sustainable merchandising of apparel, using customer satisfaction as a starting point. This can provide solution ideas for sustainable and circular practices in the textile and apparel industry and help policymakers and practitioners to further engage in sustainable merchandising of apparel.

5. Conclusions

This paper examines the influencing factors of sustainable merchandising of apparel by reviewing cases and the literature related to merchandising strategies. Based on the existing literature, it was found that there are differences in the perceptions of producers, government, and consumers around the sustainable merchandising of apparel. Some producers take actions within their capabilities in the sustainable merchandising of apparel, as most of them are led by business leaders to achieve sustainable merchandising, whereas consumers’ perceptions about sustainable merchandising still need to be improved. The government does not have a standard or policy to regulate the merchandising market for sustainable apparel merchandising. The results of the study show that consumers’ perceptions of the sustainable merchandising of apparel are affected by various factors, such as barriers to sustainable merchandising perceptions and barriers to sustainable merchandising standards. Based on producer, government, and consumer perceptions and actions, the complexity of factors influencing apparel sustainable merchandising and merchandising strategies was observed in different studies. This study finds that consumers’ purchasing power for sustainable merchandising products is affected by the strength of publicity and promotion due to a weak or even a lack of understanding of sustainable merchandising. Currently, consumers are increasingly concerned about the producer’s concept of social responsibility and whether they are taking responsibility and actions for their role in social responsibility. Social responsibility is the foundation of sustainable merchandising, and merchandising without social responsibility is risky. Environmental responsibility is also crucial, as environmental responsibility shows the producer’s attitudes, degree of advancement, embodiment of scientific and technological capabilities, and their very ability to show innovation. Therefore, producers should make social responsibility, environmental responsibility, and sustainable merchandising interdependent and promote each other, so as to improve the reputation and recognition of enterprises in the hearts of consumers and increase the awareness of their peers in the industry. The study found that most producers make changes to the raw material side of sustainable merchandising and sell their products with as little packaging as possible. However, after the product is sold, there is not much action taken to recycle the product, which is a drawback of producers in the sustainable merchandising process. If producers can combine sustainable merchandising and consumer education in the process of sustainable merchandising, i.e., disseminate consumer knowledge to consumers so that they can increase their consumption skills, improve the quality of consumption, etc., and learn more about the advantages of reusing products and acquire more knowledge about sustainable consumption, then they can better explain the social and environmental responsibilities of producers in the process of sustainable merchandising. Currently, there are few specific policies related to sustainability, and most consumers and producers compensate for their lack of knowledge about sustainability through self-learning. The government needs to provide more opportunities to learn about sustainable merchandising policies or guidelines in order to increase consumers’ knowledge of sustainability and improve the quality of producers’ sustainable merchandising.

The emergence of “greenwashing” merchandising has challenged the apparel market. Although there are some regulations against “greenwashing”, they are not effective and lack systematic control. With regard to the emergence of “greenwashing” merchandising, the government should not only make standardized regulations to restrain producers, but also hold regular lectures and knowledge contests in public areas to learn about the regulation
of “greenwashing” merchandising. In this way, producers and consumers will have a full understanding of “greenwashing” merchandising, and the standardized management of the clothing market, the full protection of the rights and interests of consumers, and the sustainable merchandising of clothing can be better developed.

This study has limitations due to the authors’ conditions and objective factors. Firstly, the scope of the collected merchandising cases cannot cover all global brands and the contents of the cases are not comprehensive, which may lead to limitations in the theoretical analysis. Secondly, this study did not conduct a large number of questionnaires and interviews with consumers; thus, it cannot directly obtain consumers’ views on the sustainable merchandising of apparel brands. In future research, producers can consider changing from the previous enterprise-led merchandising to empowering merchandising that stimulates the lifelong merchandising value of users and achieves merchandising growth with user growth, creates value for consumers, improves consumer trust, and makes the starting point of sustainable merchandising revolve around consumers so that they can truly participate in it. In addition, the recycling management of used clothing after sustainable merchandising is very important, including the fine classification of used clothing, the life cycle of used clothing after recycling, and the carbon emissions generated after recycling. At the same time, there is currently a delay in communication and information transfer between researchers and practitioners, which leads to a slower integration of researchers’ research results with business, a decrease in the conversion rate of research results to business results, and a certain detachment between research and business. Exploring ways to effectively integrate research results with business development is also a topic worth exploring in future research.

**Author Contributions:** Conceptualization, B.W. and Y.H.; methodology, B.W. and Y.H.; software, X.X. and Z.J.; formal analysis, W.K. and H.B.; investigation, Z.D. and Y.H.; data curation, X.X. and Y.H.; writing—original draft preparation, B.W. and X.X.; writing—review and editing, Y.H.; supervision, X.D. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was funded by the National Natural Science Foundation of China (Grant Number: 61906129), the China Association for Science and Technology Youth Support Talent Project (Grant Number: 2021-298), and the Hong Kong Polytechnic University GBA Startup Postdoc Programme 2022 (Grant Number: SP-22-13).

**Institutional Review Board Statement:** The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of Soochow University.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Conflicts of Interest:** The authors declare no conflict of interest.

**References**


