

THE IMPACT OF ASYMMETRIC SUPPLY CHAIN RELATIONSHIPS ON SUSTAINABLE PRODUCT DEVELOPMENT IN THE FASHION AND TEXTILES INDUSTRY

1. Introduction

The growing power of retailers and power asymmetry is evident in the relationships between fashion suppliers and fashion retailers (Talay et al., 2018; Wen et al., 2018; Oxborrow & Brindley, 2014) as retailers exert more power to control and lead their supply chains (Agrawal & Smith, 2015). Power asymmetry has been investigated in food supply chains as a destructive force (Maglaras et al., 2015; Hingley, 2005) and in the fashion and textiles retail sector as supporting the suppliers' capabilities while restricting their innovative abilities (Talay et al., 2020; Oxborrow & Brindley, 2014 and Hines & McGowan, 2005). We wished to explore the impact of asymmetric relationships within sustainable fashion and textiles supply chains, as previous research had been fragmented, while understanding of the relational view appears limited in sustainability literature (Talay et al., 2020; Jean et al., 2017; Touboulic & Walker, 2015; Curwen et al., 2012).

This study focuses on asymmetric relationships within sustainable fashion and textiles supply chains. By undertaking a qualitative study on large UK retailers and small suppliers, the paper offers a greater understanding regarding both the impacts of asymmetry in supply chain relationships and the sustainable product development (SPD) that results. Asymmetric relationships between suppliers and retailers significantly determine SPD patterns, thereby facilitating product longevity, and subsequently reducing the environmental impacts of fashion products (Goworek et al., 2020). In the UK, increased fashion sales volumes (ONS, 2022), short lead times and the continuous evolution in fast fashion trends, mean that consumers retain clothes for less than their expected lifespan (Barnes & Lea-Greenwood, 2010), impacting on

environmental and social sustainability (WRAP, 2017). The ‘Fixing Fashion’ report (House of Commons Environmental Audit Committee, 2019) suggests that fashion retailers in the UK need to address sustainability, while growing consumer concerns increasingly exert pressure on large fashion retailers to develop more sustainable products (Goworek et al., 2020).

This research aims to address the following objectives:

- To identify the types of relationship asymmetries between suppliers and retailers in sustainable fashion and textiles supply chains
- To understand how types of relationship asymmetries influence sustainable product development in fashion and textiles supply chains.
- To evaluate the implications of relationship asymmetry types in sustainable product development in fashion and textiles supply chains.

Our research makes a theoretical contribution, being among the first to examine asymmetric power relationships through an SPD framework between fashion and textiles suppliers and retailers, since SPD has erstwhile been overlooked with few theoretical models (Parker-Strak et al., 2017). This contribution adds an extra dimension to theory on relationships between organisations and their suppliers by clarifying the nature, scale, and impact of asymmetries in their interactions and the consequences on sustainability in supply chains. Data collection from both suppliers and retailers yielded fruitful contrasts. The SPD framework adapted and used in this study provides a new approach to understanding the interactions between suppliers and retailers, identifying power asymmetries during product development, and ways to redress asymmetry in dyadic relationships. The utilisation of the framework adds a further dimension to the work of the Industrial Marketing Purchasing (IMP) school and the interaction approach (e.g., Hakansson & Snehota, 1995; Ford et al., 1986).

The main contribution of our paper is to identify and address asymmetries in supply chain relationships, enabling companies to overcome relational obstacles in their journey towards a more sustainable fashion and textile industry. Our empirical contribution therefore explores the perspective of both suppliers and retailers in two asymmetric relationship types: uniform asymmetry and co-existing asymmetry. The approach also contributes by addressing the persistent challenge for supply chain researchers of **engaging both suppliers and High Street retailers in dyadic academic studies (Oxborrow and Brindley, 2014)**.

2. Literature review

2.1 Power Asymmetry in supply chain relationships

The concept of power asymmetry can be easily observed in supplier-retailer studies because in asymmetric exchange relationships, retailers are usually the dominant party holding the power and can set the ground rules (Hingley et al., 2015). Several researchers have explored power asymmetry in supply chain exchanges (Talay et al., 2018, Johnsen et al., 2020). They find that the powerful party applies its power in two main areas: the strategic and operational areas of the weaker party, while the weaker party accepts the control of the powerful party in its business actions in both areas (Johnsen & Ford, 2008). **Moreover, Johnsen et al., (2020) posit that asymmetric power of a dominant party results in a hegemony over the supplier that exerts excessive influence and sustains economic privilege through taking an unbalanced value share from the supply chain that can push suppliers to involve abusive labour practices and focus on short-term goals.** Furthermore, power asymmetry in supplier-retailer relationships affects the weaker party's adaptive and collaborative behaviour which may lead the powerful party to act opportunistically within the relationship (Touboulic & Walker, 2015).

There is no widely accepted view of the adverse effects of power asymmetry (Belaya et al., 2009). Indeed, Hingley (2005) argues that asymmetry is not necessarily a barrier to developing relationships where the relationship itself provides mutual benefits that outweigh any adverse effects of power asymmetry; where weaker organisations tolerate asymmetry and where power asymmetry can stabilise relationships (Lawler et al., 1988). Furthermore, power can be employed by the stronger party to achieve targets and resolve conflicts with the weaker party (Belaya et al., 2009). Consequently, understanding the power structures that exist in supply chain relations can help to achieve the strategic management of supply chains and effective operational practices (Cox, 1999).

2.2 Application of asymmetric power in sustainable fashion supply chains

The fashion industry is characterised by outsourcing, delocalised, and decentralised supply, as well as production management systems that require co-ordination across several countries and supply chain members (Abernathy et al., 1999). Outsourcing from developing countries generates the potential risk that both local and external suppliers may reduce production costs by employing unethical practices, such as child labour, exploiting workers' rights or absence of hygiene standards (Oxborrow & Lund-Thomsen, 2017). Maintaining environmental sustainability and corporate social responsibility therefore becomes increasingly problematic for buyer organisations because of the lack of transparency of the origin of outsourced supplies (Runfola & Guercini, 2013). Consequently, large buyers may handle problems unilaterally by forcing suppliers to adopt their codes of conduct in Sustainable Supply Chain Management (SSCM) (Turker & Altuntas, 2014), but this has resulted in conflicts and has shortened relationships with suppliers (Maglaras et al., 2015). **Furthermore, Fontana et al., (2021) found that the dominance of brands in selecting their first-tier suppliers, is extended to their nomination of sub-suppliers upstream, which in turn reduces the direct supplier's ability to**

achieve sustainability compliance, while commercial (or cost-saving) outcomes are implicitly prioritised. Meanwhile, Akrouf & Guercini (2022) stress the importance of long-term relationships and trust in the traceability and certification of sustainable fashion products and the corresponding significance of sustainability within buyer-supplier relationships.

Practice from outside the sector would suggest that focal organisations implement mentoring and monitoring strategies to audit suppliers' non-compliance with sustainability requirements (Meqdadi et al., 2020); compliance with codes of conduct representing the buyer organisation's values and principles (Seuring & Muller, 2008); or enhance suppliers' sustainability capabilities and knowledge to develop their resilience against internal and external environmental shocks (Teece et al., 1997). Collaboration in environmental matters is therefore considered a significant factor in suppliers' sustainability performance (Seuring & Muller, 2008), developed through direct involvement in joint projects and interactions (Ni & Sun, 2018) and a substantial resource contribution from the focal organisation, including offering training, mentoring and joint sustainability activities (Tachizawa & Wong, 2014).

2.3 The interaction approach and power asymmetry in supply chain relationships

The Interaction Model (Håkansson & Snehota, 1995; Ford et al., 1986) depicts power as an important characteristic of dyadic relationships, which is affected by the actions and interactions of both parties. Power asymmetry is associated with coercion in a relationship (Hausman & Johnston, 2010) in contrast to the powerful party using power in a positive sense, to influence suppliers to improve the implementation of sustainability (Zhu et al., 2005). Power asymmetry may influence the level of suppliers' agreement and commitment to sustainability practices (Touboulic et al., 2015), while coerced power may discourage suppliers from adopting sustainability requirements (Reuter et al., 2010), and dependence on suppliers' resources to improve sustainability can lead to a power shift in dyadic relationships (Touboulic

et al., 2015). Therefore, power *symmetry* rather than power *asymmetry* can achieve greater results in sustainability implementation in dyadic relationships (Touboulic et al., 2015). In sustainable supply chain research, stakeholder theory, institutional theory and resource-based view have erstwhile been used as theoretical lenses, but there is a dearth of adoption of an IMP Interaction Approach (Johnsen et al., 2016).

2.4 Asymmetric supply chain relationships and sustainable product development

New product development (NPD) is seen as a vital part of any supply chain management, crucial to enable fashion organisations to align supply chain design with product development processes (Grose, 2018; Khan et al., 2012), and NPD is an early-stage activity concerning close relationships with value driven partners (Pal, 2014), **involving a set of activities that are shared and accomplished by supply chain parties through collective roles (Marche et al., 2019).** Indeed, Suurmond et al., (2020) have found that an extensive supplier participation has a positive effect on NPD efficiency and effectiveness. In contrast, the involvement of the purchasing department in early stages of the NPD facilitates absorption of supplier knowledge and connection (Picaud-Bello et al., 2022). Therefore, collaborations in sharing knowledge and integrating resources with suppliers are essential (Marche et al., 2019), and reduce the social and environmental impact (Mehdikhani & Valmohammadi, 2019; Lu et al., 2018), facilitating the addition of sustainability criteria to NPD. **Indeed, the significance of the supply chain on SPD is emphasised further by Cooper and Claxton (2022) who confirm that producers and brands will be obliged to take on increasing responsibility for reducing the environmental impact of clothing production.**

In practice, interests of parties in the SPD process may cause disruptions because of the conflicting priorities of the parties (Goworek et al., 2020), aggravated by asymmetric power in supply relationships (Talay et al., 2020). Johnsen & Machat (2006) categorised relationship

asymmetries as uniform relationship asymmetry, and co-existing relationship asymmetry. *Uniform asymmetry*: small suppliers with uniform relationship asymmetry may experience a very limited opportunity for relationship development that will lead to the point of inactivity, and the supplier may also be unable to identify any product development opportunity. In contrast, *co-existing asymmetry*: small suppliers with a co-existing relationship may experience a high degree of mutuality and a flexible approach to develop relationships with larger customers.

Traditional fashion retailers have focused on production costs, quality, and availability of products to meet the demands of growing fashion markets by outsourcing their production operations (Fernie & Sparks, 2019). **This strategy requires linear and sequential arrangements in the supply chain which involves many stages; supplies of fabrics, designs and continuous adjustments in product developments and production (Varley et al., 2019).** Therefore, retailers often take control of their supply chain operations by exercising asymmetric power to suppress costs and remain competitive (Wen et al., 2018) but Talay et al. (2020) found asymmetric power in supply chain relationships detrimental to fashion SPD processes. This may compromise sustainability efforts in the early stages of product development and performance (Jadhav et al., 2018; Oxborrow & Brindley, 2014 and Hines & McGowan, 2005). However, the need to achieve sustainability in fast fashion, highlighted by exposure of the astronomical level of fashion waste and its effect on the environment and social sustainability, has shed light on many challenges, all of which closely relate to NPD processes (Rutter et al., 2017).

Curwen et al. (2012) have consolidated the challenges and solutions of sustainable apparel product development into five key principles. *'Company mandate'* - **the need for new approaches in governance for long/short term financial goals, standards, and controls** (Hoejmose et al., 2012). *'Core values match'* - strategic goals that balance trade-offs between

cost, aesthetics and time and are shared between organisations (Kumar & Noble, 2016). *'Knowledge sharing'* - information-sharing between parties to understand the nature of consumer demands (Fletcher & Grose, 2012). *'Cross functional organisation'* – continuously measured collaborations in relationships on SPD processes (Gam et al., 2008). *'Significance of the supply chain'* – reflects the importance and relations of supply chain members (Jean, et al., 2017), and locational significance (van Oorschot et al., 2018). Although based on a single fashion business case study, this approach indicated that 'company mandate' and managing relationships with suppliers were crucial in SPD process completion.

2.5 Conceptual development

Several researchers have conceptualised power in buyer-supplier relationships (Talay et al., 2018; Touboulie et al, 2015; Hingley, 2005; Meehan & Wright, 2012). To these researchers, power is a central construct in supply chain relationships and can be destructive as well as constructive, a cause of confusion in existing literature: is asymmetric power harmful or stabilising to sustainable supply chains (Touboulie et al., 2015; Hingley, 2005; Belaya et al., 2009)? This uncertainty led to our first objective to identify the types of relationship asymmetries through an examination of suppliers' and retailers' experiences and views in their sustainable supply chain relationships. Further, it is evident that both *'Uniform asymmetry'* and *'Co-existing asymmetry'* exist in supply chain relationships (Johnsen & Machat, 2006), but less clear how or whether these types of asymmetries hinder or facilitate SPD and the processes described in fashion supply chains specifically (Curwen et al., 2012 and Goworek et al., 2020). These include governance, sustainability orientations, values, information exchanges, collaborations, and locality in supply chains - informing our second objective. The third objective reflects on the combination of sourcing, product development and distribution in fashion supply chains combined with ongoing asymmetric power issues to provide a suitable

research context to understand the implication of relationship asymmetry in SPD (House of Commons Environmental Audit Committee, 2019). Therefore, the evaluation of the implications demonstrates the significance of relational asymmetry that brings difficulties and provides opportunities in SPD processes and addresses the balance between managerial, commercial and sustainability issues.

The importance of tracking both the upstream supply chain and any developing relationships in conjunction with SPD efforts was emphasised by Curwen et al. (2012). However, the application of power by retailers, and their suppliers' responses, may differ in sustainable supply chain relationships in which buyers see their suppliers as strategic partners (Pagell et al., 2010). Indeed, collaboration in environmental matters (Seuring & Muller, 2008), in integrating resources (Marche et al., 2019), in the reduction of environmental impact (Mehdikhani & Valmohammadi, 2019), and in SPD processes (Gam et al., 2008) have demonstrated that relationships play important roles in SPD. When developing our SPD framework, this link led us to explore further the premise behind Curwen's five SPD principles, which emphasised the importance of the mandate that governs how SPD depends on the wider organisational and management practices, combined with supply chain collaboration (Claxton and Kent, 2020; Goworek et al., 2020). All of Curwen et al.'s (2012) key principles for SPD in the fashion sector, namely '*Company mandate*', '*Core values match*', '*Knowledge sharing*', '*Cross functional organisation*', '*Significance of the supply chain*' were combined with the concept of asymmetry in small supplier-large buyer relationships to develop the framework (Adapted from Curwen et al., 2012 and Johnsen & Machat, 2006).

An examination, across multiple case studies, of the various fashion and textile companies' design journeys, supply chain dynamics and interactions in supplier-retailer relationships, enabled us to reveal and compare similarities and differences in the approaches adopted by

retailers and suppliers in two different asymmetric relationship types: uniform asymmetry and co-existing asymmetry. Table 1 and 2 indicates how the framework enabled us to demonstrate how each individual relationship characteristic is exposed and shown in Meta-matrices and guides the development of the empirical study.

3. Research design and methods

3.1 Sampling and qualitative data collection

The research design implemented a multiple exploratory case study approach (Yin, 2003) to allow rich data to be collected. The research adopted a qualitative approach to explore dyadic supplier-retailer relationships and the influences on SPD. Primary data was collected through 12 interviews with 10 SME fashion suppliers in the UK and two High Street retailers in the UK, as listed in Table 3. A purposive sampling method was used to choose participants for semi-structured interviews (Eisenhardt, 1989) with participants combining experience and a senior leadership or technical role within a supplier or retailer - criteria established to ensure reflecting management issues in a real-world context. Participants all had at least five years of experience in SPD, production or buying and sustainable supply chain relations and could provide in-depth answers (Creswell, 2012). The sampling procedure also extended to participant firm selection based on three selection criteria: a) implementing sustainability policies b) involvement of SPD processes and c) operating as supplier firm or retailer in the textiles and clothing sector. These two approaches in sampling complemented each other and provided depth and consistency in data collection. The sample of 12 interviewees was considered as appropriate since at this number qualitative studies of a homogeneous group can reach saturation point (Boddy, 2016). Two pilot interviews with fashion suppliers enabled us to further explore SPD in asymmetric supply chain relationships.

After confirmation of participant demographics, interview questions explored the research focus: the role of asymmetry in sustainable supply chain relationships and SPD processes and invited exploration of three core sub-themes. First, asymmetric supply chain relationship characteristics and the influence of asymmetries in relationships were drawn from the current literature on industrial marketing (Talay et al., 2018; Touboulic & Walker, 2015; Johnsen & Ford, 2008; Hingley, 2005). Sustainability focus, policies, control, and implementations in sustainable supply chains were drawn from sustainable supply chain literature (Talay et al., 2020; Touboulic et al., 2015; Seuring & Muller, 2008). Finally, sustainability values, information exchange, cross-collaborations, supply chain significance and location were drawn from SPD literature (Goworek et al., 2020; van Oorschot et al., 2018; Curwen et al., 2012). The authors conducted semi-structured interviews to explore the participants' attitudes and experiences and to achieve a consistent in-depth approach across the interviews, whilst offering the flexibility to adapt the questions to the context of the individual's organisations. Interviews were recorded, transcribed, and lasted from 45-90 minutes at the interviewees' premises.

3.2 Data analysis

The transcripts were annotated to generate open coding (Miles & Huberman, 1994) through Nvivo 12. Thematic data analysis generated common issues raised by the retailers and suppliers during interviews, as well as those evident in, or contrasting, the literature review. The issues of governance, unilateralism and bilateralism, monitoring and mentoring were surprising findings that emerged from the research following discussions with participants to identify the central theme of SPD in different types of asymmetric relationships. The codes included reducing, displaying, and interpreting the analysed data (Miles & Huberman, 1994). This process was an iterative way to identify themes and categories. The abductive process enabled new understandings to be explored through comparing dissimilar literature until saturation was

reached (Eisenhardt, 1989). Thereafter, axial coding brought the open codes around the central phenomenon to analyse the findings thematically (Creswell, 2012).

The Meta-matrices (Summarised in Table 1 and 2) were used for the cross-case analysis (Miles and Huberman, 1994), offering analytical generalisations from the individual case study findings, while generating a far-reaching picture of intra and inter-firm interpretations, hence providing both external and internal validity (Yin, 2003). This approach supported our intra-case comparisons within *uniform asymmetry* and *co-existing asymmetry* relationships and highlighted similarities and differences between retailers and suppliers enabling us to draw conclusions from the findings of this empirical study.

4. Empirical Findings

In this section, the research findings addressed the first objective of the research by ‘*identifying asymmetry types*’ in sustainable fashion supply chains. The findings support the development of the conceptual framework of asymmetric supplier-retailer relationships. The findings have demonstrated that both uniform asymmetry and co-existing asymmetry in fashion supply chains exist in the UK, consistent with Johnsen and Machat’s (2006) categorisation. All fashion suppliers in this study provide contract manufacturing services, predominantly sourcing and production for large organisations, primarily large fashion retailers in the UK. This has provided a suitable ground to identify asymmetry types in fashion supplier-retailer relationships.

Both asymmetry types have been identified in the areas of relationship governance and sustainability orientations, core values, information exchanges, departmental collaborations, and the importance of supply chain locality. Uniform asymmetry was evident as the retailer dominates and controls supply chain relationships to achieve its own sustainability goals unilaterally by providing very little room for suppliers to raise their voices in SPD within

relationships. In contrast, co-existing asymmetry was evident as the retailer assists and encourages suppliers to reach an optimum level of engagement in SPD with benefit for both parties to maintain supply chain relationships.

The second objective of the research: ‘To understand how the types of relationship asymmetries influence SPD in fashion supply chains’ was answered by exploring the responses of both UK suppliers and retailers in more detail (See Table 1 and 2). The nature of the influences of uniform and co-existing asymmetry on SPD have been identified as sustainability orientations and governance, unilateralism, and bilateralism in values, gaining and exchanging information, monitoring, and mentoring in cross functional teams, and the control of supply chain and critical path management all of which determine SPD (Curwen et al., 2012).

The scale of the influence of uniform asymmetry is different from co-existing asymmetry on SPD. In uniform asymmetry relationships, the main driver was economic sustainability orientation in SPD. Social and environmental sustainability were focused less on SPD by both parties. On the other hand, in co-existing asymmetry relationships, the participants focused on economic, social, and environmental sustainability in SPD equally by developing mutual sustainability goals. Therefore, the impact of the asymmetry types on SPD differs in sustainable supply chains.

In the next section, the paper will provide the findings that address the second objective.

4.1 Company mandate

Limited sustainability orientation: sustainability orientation in relationships with suppliers for developing sustainable products in terms of standards, controls, and long-term and short-term financial goals play an important role (Boström et al., 2015). In uniform asymmetry relationships, it was evident that the retailer was reluctant to involve all stages of SPD because

of a lack of risk-taking in financial and managerial issues which contradicts both Pal's (2014) notion that NPD is an early-stage activity involving close relationships with partners and [Picaud-Bello et al., \(2022\) which illustrates the advantages of early involvement](#). For example, there was very limited room for suppliers to negotiate and discuss the cost difference of recycled polyester and clarify the viability of product designs. Moreover, unclear SPD policies were provided by the retailer in terms of waste management and the reduction of environmental impact. Consequently, Supplier 3 stated: "It's all about the sustainability of the physical product. It's never about the social sustainability issues, the retailer wants to change a polyester to a recycled polyester, but they don't necessarily want to pay the upcharge".

Comprehensive sustainability orientation: in co-existing asymmetry relationships, the retailer provided clear auditing procedures for suppliers by focusing on their implementations of codes of conduct, such as water treatment, recycling, waste management and certification procedures, and involved all stages of SPD and production, giving integrated roles for each party (Marche et al., 2019). Audits pre- and during-production provided further adjustments to ensure the product development process was fully compliant sustainability policies, as discussed in this comment from supplier 6: "Sometimes the retailer makes a design, which is not possible, but we tell them this is what is possible. So, they eliminate. Mutually we say, yes, we can do it and then we do. Even then it can be changed if it is not in line with sustainability policies".

The retailer and suppliers discussed the price to overcome the cost and social aspect balance in the early design stage. This was extended to after-sales stage discussions that examined whether sustainable goals are achieved in line with Jadhav et al., (2018).

4.2 Core values match

Unilateral approach: core values match reflects the balance between cost and aesthetics in SPD (Kumar & Noble, 2016). In uniform asymmetry relationships, the unilateral approach of

the retailer evidently determined the balance between design, cost, and aesthetics. Consequently, the core values did not match the sustainable production process and are not in line with research by Pal (2014) because the best-selling product categories and their commercial value dominated the retailers' values, rather than production process and environmental impact (Goworek et al., 2020). Supplier 2's comment demonstrates this point: "Shared values are not really a key factor. We do have shared goals, but the profitability is weighted in favour of the brand".

Bilateral approach: in co-existing asymmetry relationships, established sustainability standards helped suppliers to understand the value priorities of the retailer. This provided a ground for both parties to adopt a bilateral approach by establishing long-term relationships. For example, retailer 2 states: "We still had the same expectations in terms of audits, values and the fundamental issues. It just meant that if there was an issue, we could use that conversation piece". The retailer did not exercise its asymmetric power on cost and profitability which were well balanced with the social sustainability responsibilities of suppliers, but the application of sustainable codes of conduct did not always satisfy the aesthetic expectations, because some fabric types needed extra treatment because of technical processes. Supplier 7 gave a response which represents other respondents in this respect: "Sustainability is not about a policy; it's about implementing it. We are going beyond the minimum sort of legal and technical standards in fabric processing but there is always that balance between cost versus benefit in our relationships with the retailer". Moreover, suppliers were more committed to exceed expectations with the retailers by offering tailor-made solutions which were highly valued by the retailer and enhanced the trust that may be a key enabler for NPD (Jean et al., 2017).

4.3 Gathering and diffusing information involves information-sharing or diffusing, and the information need of other parties to understand the type of consumer demand (Fletcher & Grose, 2012).

Gaining information: gaining information and exchanging information were the main patterns in information-sharing between retailers and suppliers, vital to SPD (Lu et al., 2018). However, in uniform asymmetry, the retailer requested and gained information from suppliers yet there was a lack of reciprocation because of the reluctance of the retailer to share information unless any problems occurred at design stage, as per this response from Supplier 4: “Fabric performance assessments are regularly shared with the retailer, but insufficient technical guidance and ill-timed responses from the retailer in product designs made us seek outside help to fill the gap”. In addition, the retailer’s inability to understand and respond to the information need of suppliers created difficulties in SPD processes and the evaluation of future commercial potential of sustainable products.

Exchanging information: in co-existing asymmetry relationships, regularly exchanging knowledge and information enhanced mutual commitments of parties in SPD. The findings highlighted that the diffusion of information regarding sustainable design, production and delivery between suppliers and retailers are consistent with Mehdikhani and Valmohammadi’s study (2019). For example, Supplier 9 stated: “Regular updates about sustainable consumer trends from the retailer were providing clear tips for product development”.

4.4 Cross functional organisation

Monitoring: cross functional interactions require collaboration (Gam et al., 2008) and **longevity (Akroun and Guercini, 2021) in relationships**. In uniform asymmetry relationships, the retailer collaborated with suppliers to a very limited extent in the production process and financial risk-taking in outsourcing of fabrics. In contrast, the retailers’ dependency on suppliers’ design

offerings was one of the rare areas where collaboration took place between design teams. The retailer was mainly monitoring suppliers' compliance with sustainability requirements through audits, but lack of regular feedback from this monitoring activity limited suppliers' capability to implement improvements in SPD (Curwen et al., 2012), supported by the following quote from Supplier 5: "The credibility of fabric suppliers was the focus of the retailer but our efforts in technical knowledge-seeking in the process of turning the fabrics into products were just noted down". This monitoring strategy in the dyadic level relationships concurs with Meqdadi et al. (2020) but fails to support suppliers to develop specific capabilities that support SPD.

Mentoring: in co-existing asymmetry relationships, team-based collaborations through outsourcing, design and production were evident. The retailer discussed after-sales reviews with suppliers to set future directions and the suppliers' designers and the retailer's buying team often collaborated in buying processes. The retailer mentored suppliers by providing regular feedback and guidance on implementing sustainability codes of conduct. Suppliers' upstream connections were assessed by the retailer to highlight the outsourcing risk. In addition, the retailer supported suppliers to obtain certification and discussed the potential pitfalls in sustainable designs, which supported suppliers' capability development in SPD. This situation is demonstrated by Supplier 8's comment: "The deficiencies in our technical capabilities and the significance of assessing our outsourcing risks for the product development process were highlighted in the retailer's audit reports and solutions were discussed with us".

4.5 Supply chain significance: supply chain control and critical path management reflects the importance and relations of supply chain members and locality (Jean et al., 2017; van Oorschot et al., 2018). Retailers in both asymmetry types controlled their supply chain by exercising asymmetric power (Agrawal & Smith, 2015). In uniform asymmetry relationships, the retailer used coercive power to control the cost in the SPD process and safeguard its own commercial

self-interests by restricting suppliers to outsource fabrics from certain regions and countries to save on the cost of transportation and involving limited cross-departmental collaboration in product design and production, **slightly less deterministic than Fontana et al., (2021)**. Moreover, suppliers were requested to establish in-house fabric testing centres, a financial burden for them. All these control measures had the potential to result in financial losses and poor supplier performance, negatively impacting on critical path management in SPD. As Supplier 1 states: “It is a double-edged sword, increasing cost of sustainable fabric outsourcing from certain geographies and unsatisfactory fabric approvals put our product development process off and cost us more, but these are just seen as variable costs by the retailer”.

In contrast, in co-existing asymmetry, the retailer exercised its expert power to control the supply chain by requesting suppliers to apply sustainability policies when outsourcing from different geographies and provide fabric origin traceability to the retailer, which helped suppliers validate fabric test results. Retailers’ demand forecasting and real-time inventory sharing helped suppliers to realise early design development and outsourcing arrangements which helped to execute critical path management in SPD in line with van Oorschot et al. (2018).

5. Discussion

Retailer-supplier relationships in apparel supply chains are typically asymmetric and increasing power of retailers is evident (Oxborrow and Brindley, 2014; Talay et al., 2018). In this section, the paper will discuss the implications of relationship asymmetry types for SPD in fashion supply chains.

Mis-functioning processes: in uniform asymmetry, a company mandate with limited sustainability orientation of the retailer that limits suppliers to implement sustainability policies into product development may result in mis-functioning processes in SPD. Evidence confirms

an insufficient level of guidance and missing links in SPD processes (outsourcing, designs, manufacturing), and a low level of communication between processes and functions during the development of sustainable products. This could compromise retailers' justification of environmental and social sustainability claims and, longer term, lead retailers to face economic losses through overlooking other aspects of sustainability in the design stage, while the public and governments approach sustainability holistically and increase pressure on retailers (Goworek et al., 2020).

Missing the balance between cost and aesthetics when developing sustainable products: the findings clearly highlighted the opportunity to develop a fair balance between cost and aesthetics when developing sustainable products by integrating SPD and supply chain relationships. The retailer's unilateral approach dictated values, mainly focusing on cost and commercial priorities (Kumar & Noble, 2016). This may undermine social and environmental sustainability compliance of suppliers and limit the chances of achieving aesthetic criteria in SPD (Hoejmose et al., 2012). However, the bilateral approach provides a fair ground to balance cost against aesthetics by creating mutual values through clearly defined codes of conduct and establishing long-term relationships and trust in fashion supply chains.

An early evaluation of product potential to meet customer demands: regularly exchanging information between retailers and suppliers highlighted a clear opportunity for an early evaluation of the potential of sustainable products at the design stage, consistent with Lu et al. (2018). Understanding the information needs of suppliers enhanced the level of commitments and improvement of relational bonds (Jean et al., 2017). Therefore, the diffusion of information regarding sustainable fashion trends and concerns, demand types and patterns of consumer markets with suppliers provided a platform for early evaluation of the potential of sustainable products to meet consumer demands, consistent with findings from Fletcher & Grose (2012).

Furthermore, an early evaluation of sustainable product potential indicated the importance of the integration of upstream tiers in supply chain management.

Generating mutual benefits: co-existing asymmetry offers capability development opportunities for fashion suppliers, consistent with Hines & McGowan (2005), involving design, production processes and discussions with the retailer (Meehan and Wright, 2012), which may lead to developing collective interest with the retailer for SPD (Jean et al., 2017) and the integration of SPD and supply chain (Khan et al., 2012). Consequently, in uniform asymmetry, a monitoring approach did not offer much to suppliers to develop capabilities in SPD process. However, in co-existing asymmetry, mentoring offered capability development opportunities for suppliers through involvement of SPD (Meqdadi et al., 2020).

Geographical distance of upstream suppliers and reduction of supply chain risk

The findings also highlight the ability to reduce risks in fashion and textiles supply chains.

In co-existing relationships, approvals of fabric origins through traceability reports and building in-house test centres to provide fabric test results quickly, in return for sharing inventory levels, helped the design teams in early design development and potential sourcing arrangements (location and quantity of suppliers) in the best time possible. This helped to execute critical path management in SPD and reduce the supply chain risks through short lead-times for sourcing raw materials, consistent with van Oorschot et al. (2018). However, in uniform asymmetry relationships, the retailer's unilateral approach and restrictions on suppliers' sourcing of raw material to save on transportation costs, extended raw material lead-time and increased the cost of production in SPD. Retailer 2's comment reinforces this view: "Employing local workforce, sourcing from local material and fashion processing service providers are all encouraged, to overcome cost and time issues".

6. Conclusion

The conceptual developments of the paper aimed to contribute to the IMP interaction approach (Håkansson and Snehota, 1995 and Ford et al., 1986) by examining how asymmetric relationships in sustainable supply chains (at a dyadic level) influence SPD (Jean et al., 2017; Talay et al., 2020). Interactions between buyers and suppliers help to make changes to their activities, resources, and capabilities (Johnsen and Ford, 2008) and fill the gap in the IMP view that has been expressed by Johnsen et al., (2016), a scarcity of adoption of the interaction approach in sustainable supply chain research.

This research applied empirical data to theoretical work, drawing on various schools of thought. The findings were analysed within a framework (Table 1 and 2) developed from the key principles for sustainable design, proposed by Curwen et al. (2012) and types of relationship asymmetries (Johnsen and Machat, 2006). The implications of asymmetric supply chain relationships in SPD in one sector and one country has focused on the depth of rich data collection and has provided evidence from retailers which have global supply chains operating in many other contexts. Therefore, the authors found that this framework is effective in its application to supply chain relationships and SPD in the UK and especially in emerging markets such as Vietnam, China, and South Korea, because most of the retailers are already international and sustainability determines their supply chain relationships and SPD. In addition, the framework highlights the disparities between value-driven retailers' and cost-driven retailers' supply chain relationship strategies regarding SPD processes.

Our research is among the first to examine types of power asymmetries and SPD within fashion supply chains through providing insights from both retailers and suppliers as a dyadic approach (Talay et al., 2020) by combining the asymmetric relationship concept with SPD principles to build a framework in response to Parker-Strak et al., (2017) who stated that relatively few

theoretical models have been provided in relation to the fashion product development process. This is therefore a significant theoretical contribution of the research.

The main findings of the research derived from our first objective, which identified common types of asymmetries in supply chain relationships between retailers and suppliers: *uniform asymmetry* and *co-existing asymmetry* in supply chain relations regarding SPD. The second objective of this research provided a clear understanding of how these types of relationship asymmetries differentially influence product development, identifying a lack of governance and limited sustainability orientations in uniform asymmetry in relationships that constrain technical capability development, infrastructure and process efficiency and negatively affect SPD. This results in a lack of motivation to adopt sustainability values, share knowledge, limited collaboration, and missed opportunities in critical path management, all of which threaten supply chain relations and SPD processes, and favour commercial self-interests. On the other hand, comprehensive sustainability orientation in the governance of co-existing asymmetry in relationships provides opportunities to develop capabilities, exchange knowledge, develop effective cross-functional activities, mutual values, and effective critical path management. All in all, balancing the commercial interests and sustainability goals of involving parties in SPD, in co-existing asymmetry, there is strong evidence that power symmetry in relationships achieved greater results in sustainability implementation in SPD (Touboulic et al., 2015).

The third objective evaluates the implications of relationship asymmetry types in SPD. This includes the prolonged involvement of retailers in relationships to avoid risks and take control whereas collaborative opportunities enabled fashion suppliers to strengthen their position within the competitive fashion supply chains. A key managerial implication is that the company mandate needs to be clear to suppliers and have a comprehensive sustainability orientation,

developing mutual values, regular exchange of information and knowledge, and support capability development of suppliers through cross-functional design teams, thereby reducing the supply chain risk.

7. Future research

Since studies on supply chain interactions in relationships and SPD are limited, further research into this field would benefit from the development of a theoretical and practical NPD model, **especially as producer responsibility for sustainability increases (Cooper and Claxton, 2022)**. There is a chance to explore in more detail the challenges faced operationally, including limited knowledge-sharing, collaborations, and geographical barriers in a local versus global context. Moreover, longitudinal research would provide new insights into SPD and asymmetric supply chain relationships. NPD models could focus on different industries and sectors and the implications for sustainable strategies, wider acceptance of common practices and initiatives that support the environment and society by comparing different country contexts.

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Table 1: Meta-matrix: retailers and suppliers, case company comparison, codes, and findings table	
Uniform Asymmetry in SPD	
Retailer 1 responses (coded)	Supplier responses
<p>Company Mandate</p> <ul style="list-style-type: none"> • Supplier auditing is mandatory; meets legal requirements. (Governance) • Unilateral formal approach resolves sustainable production-related problems. (Governance) • Core suppliers are highly rated, with long-term relationships. (Relationship-orientation) • Seasonal suppliers are low-rated or new. (Commercial) 	<ul style="list-style-type: none"> • Supplier follows retailer’s sustainability mandate [S1, S2, S4] • Retailers’ mandate is generic [S3, S5] • Focus on fabric sustainability [S4] with lack of social sustainability considerations [S3] • Profit motive dominates, even where fabric costs are increased. Fabric costs impact supplier [S1, S2, S3, S4, S5] • Supplier investment not aligned to changing retail sustainability policy [S2] • Sustainability policies over-ruled by production planning goals [S3] • Lack of technical input from retailer [S1, S4]
<p>Core Value Match</p> <ul style="list-style-type: none"> • Employee rights prioritised to meet UK legal obligations. (Standards) • Suppliers are categorised based on the retailer’s norms, values, and profit priorities. (Unilateral approach) • Retailer focuses on supplier’s designs and cost-effectiveness in sustainable production. (Design/cost/aesthetics) • Bestseller products outsourced from unethical/unsustainable suppliers. (Design/cost/aesthetics) 	<ul style="list-style-type: none"> • Limited focus on water treatment [S1, S3]; on packaging, toxic chemical treatments [S4]; on social sustainability/ ethics [S1, S2] • Inconsistency between commercial goals and sustainable goals – e.g., materials costs subject to cost engineering; lead-times too short for SPD [S1, S2, S5] • Supplier capabilities and knowledge promote SPD [S1, S4, S5] • Sustainability policies inadequately shared [S1, S2, S5] • Shared learning/investment promotes SPD [S1, S3] • Fast production provides cashflow for retailer’s outsourced sustainable fabric costs [S3]

<p>Gathering and Diffusing information</p> <ul style="list-style-type: none"> • Gaining design and technical knowledge from suppliers influence the retailer’s brand. (Gaining knowledge) • Suppliers receive after-sales notification of product-related problems. (Time specific information sharing) • Sharing of SPD information is quashed. (Limited information sharing) • Sustainable production manuals given to suppliers overlook pre-consumer waste. (Limited information sharing) • Suppliers share progress information of SPD. (Transparent information sharing) 	<ul style="list-style-type: none"> • Transparency of upstream/fabric sourcing is priority [S2, S3, S5] • Social sustainability policies are communicated too late to align with production processes or are affected by late changes to design specification [S2, S3] • Simultaneously sharing costings and ethical concerns reduces cost pressure from retailers [S3] • Information about retailer’s sustainability objectives is sporadic/inconsistent [S2, S4]; or inadequate to support SPD capability [S4, S5], sourcing [S1, S3], design [S5] or brand positioning [S2] • Retailer requires more frequent updates of sustainable products ideas and progress [S1] • Greater need for sharing of SPD actions and best practice [S4]
<p>Cross Functional Organisation</p> <ul style="list-style-type: none"> • Product design and development strategy omits collaboration. (Unilateral approach) • Retailers highly dependent on suppliers’ sustainable design packs – retailer resources limited • In-house design teams prioritise fabric test results for bestselling trends. (Monitoring) • Required pre-production supplier improvements include testing, waste management and yarn treatments. (Capability) 	<ul style="list-style-type: none"> • Retailer’s commercial concerns drive focus on problem solving [S1]; short-term decision making dominates [S3]; fabric origin, rather than production process [S5] • Supplier bears the financial risk for outsourcing sustainable materials [S2] • Sustainable product design capacity is limited. Specialist/external sustainable designers and technical expertise is needed [S3, S2] • Involvement is limited to social auditing, sustainable fibres, and packaging [S2] • Collaboration follows retailer’s acceptance of sustainable design pack • Sustainable costing and transparency [S1], internal design team [S5] enhance retailer collaboration • Technical developments support sustainable design [S1] but collaboration short-term ad-hoc [S4] or lacking S5], • Supply is conditional on audit [S2]
<p>Supply Chain Significance</p> <ul style="list-style-type: none"> • Sourcing location is an important aspect of sustainability claims. (Control) 	<ul style="list-style-type: none"> • Some fabric supply countries are banned [S1], others add reputation [S2] • Quick retail decisions on fabrics secure [S1] • Robust fibre origin traceability improves opportunities [S2, S4, S5]

- Integrated supplier facilities cut the critical path down to quick and easy processes. (Critical path)
- Suppliers' upstream relations with sustainable spinners and mills are important assets. (Relationship)
- Suppliers' locations are more important in terms of cost and distribution time than environmental logistics. (Location)
- Communication patterns must be redesigned for new suppliers of niche products. (Communication)

- Designers' knowledge of supply chain management is vital to quality [S4]; product design stage communication helps to manage sourcing and production plans [S5]
- Global logistics sustainability impacts not considered [S3]
- Maturity level of global suppliers [S2], local government subsidies [S3], experienced local workforce [S4] help to forecast & reduce ethical/sustainability risks
- Changes to fabric testing [S3] and inconsistent interpretation of results [S1] affect critical path
- Specific design requests are reconciled against environmental impacts

Table 2: Meta-matrix: retailers and suppliers, case company comparison, codes, and findings table.

Co-existing Asymmetry in Sustainable Product Development	
Retailer 2 Responses (Coded)	Supplier Responses
<p>Company Mandate</p> <ul style="list-style-type: none"> • Auditing suppliers is due-diligent, rating suppliers in terms of the degree of transparency (Governance) • Certification obtaining is mandatory to back up sustainability claims. (Governance) • Code of conduct and guidelines in terms of environmental and social responsibilities apply same to all suppliers (Governance) • Constructive approach to sustainable product related problems. (Governance) • Outsourcing strategy in all product categories is built on suppliers with long-term relationships. (Relationship orientation) • Building rapport with suppliers for the long run, and the debt to help them grow. (Commercial) • Don't work with outsourcing suppliers to avoid disapproval of traceability of material sources. (Commercial) 	<ul style="list-style-type: none"> • Retailer's sustainability awareness and policy implementation is an important determinant for sustainability code of conduct [S7,8] • Retailer expects supplier to be a driving force in sustainable product development [S6, S8]. • Suppliers' internal SPD measures are an expectation of the retailer – e.g., sustainable design input, fabric waste management, water treatment, fabric sourcing [S6, S7, S9] • SPD is the result of a longer relationship with retailer [S6, S8] • Fabric origin, authenticity, and whole life cycle must be transparent to the retailer [S8, S9, S10], meet export-import regulations [S6] but adds cost [S10] • Durability of products relevant to mid-high price point [S10] • Buyers and policy makers of the retailer have different opinions on sustainability [S9]; contrast between sustainability and pricing [S8] • Obstacles to implementation include increased fabric cost of sustainable production due to lack of suppliers [S6]; critical path milestones [S6], lack of upstream transparency [S6] • Balance between environmental/social sustainability and financial self-sufficiently must be considered [S7]
<p>Core Value Match</p> <ul style="list-style-type: none"> • Established sustainability criteria are same for all suppliers. (Standards) • Early-stage product development decisions and discussions respect suppliers. (Bilateral approach) • Strategic production updates and values are communicated to suppliers as a priority. (Bilateral approach) • The implementation of code of conduct in production and the evidence are not always satisfy the aesthetic expectations. (Design/cost/aesthetics) 	<ul style="list-style-type: none"> • Extra effort to provide tailor-made solutions to produce sustainable fashion builds trust [S6, S9, S10] • Providing manuals, agreeing policies and standards for sustainable products meets/surpasses retailer's audit [S6, S7] • Project-based SPD needs tailor made services, but retailer appreciated the cost [S7], pricing is dominated by fabric costs [S6] • Some sustainable fabric types need extra treatments that compromise aesthetics and cost [S10] • Providing training and hiring from local people helps to create sustainable design teams [S9]; Investing in employees' skills and development enhances knowledge sharing and trust with the retailer [S10] • There is a balance between the cost of sustainable designs and production versus benefit in relationships [S7]

<ul style="list-style-type: none"> • The cost of demanding treatments and finishes in products are negotiable. (Design/cost/aesthetics) 	<ul style="list-style-type: none"> • Modern Slavery Act measures in place [S7, S10]
<p>Gathering and Diffusing information</p> <ul style="list-style-type: none"> • Supplier exchange of market/technical knowledge. (Gaining knowledge) • Information exchange supports early-stage sustainable product decisions. (Time-specific information sharing) • Product development process is through informal and open lines of communication with suppliers. (Transparent information sharing) • Entrusting knowledge in suppliers improves their sustainable fabric manufacturing. (Improvement) • Equally transparent to the public and suppliers about sustainability policies and product related information. (Transparent information sharing) • Suppliers share audit reports and agree improvements. (Improvement) 	<ul style="list-style-type: none"> • Information reported to retailer includes fabric origin proofs and the whole life cycle of outsourced fabrics [S9]; open costing and transparency in sustainable sourcing/production [S7, S8]; product performance before/after production [S6] and product sustainability-related information sharing make us proactive [S10] • Information reported to supplier from retailer includes changing trends in customer preferences in the market [S9, S10] • Critical path after product design and trial order processing requires high level of technical information sharing [S6, S7] • Immediate decisions help retailer to get right product at the right time and price [S6, S7] • Energy efficient machine usage for sustainable production is the result of audits [S7] • Future commercial potential of sustainable products is the least discussed area [S9]
<p>Cross Functional Organisation</p> <ul style="list-style-type: none"> • After sales reviews are discussed with suppliers to inform/improve new product designs. (Bilateral approach) • Suppliers were trained to apply our code of conduct. (Mentoring) • QA team inspects our suppliers' fabric outsourcing. (Monitoring) • Seminars for suppliers explain consumer culture & SPD. (Capability development) • We support suppliers to obtain the right certifications for sustainable fabric processing and audit water efficiency. (Capability development) 	<ul style="list-style-type: none"> • Collaboration is evidenced between designers and buyers in the buying process [S7, S9] merchandisers and buyers in the production process [S9]; across teams in pre-design/pre-production [S6, S8]; during audits [S7]; cross-teams during factory visits[S6]; obtaining and maintaining certain sustainability accreditations [S10] • Audits indicate the level and intensity of collaboration in sustainable production [S7] • We undertake trial orders and can inform retailer what is possible in design and production for sustainability [S6] • Retailer's strategic updates informs our collaborative forecast [S6; informal collaborative seminars discuss practical processes [S9]; discussions scheduled on design packs, difficulties, contingency plans [S6] • Sustainable fabric sourcing is closely tracked by the retailer [S8,10] • Personal/ team relations are employed to solve conflicts [S7, S8]
<p>Supply Chain Significance</p> <ul style="list-style-type: none"> • Environmental/ social sustainability policies are standard 	<ul style="list-style-type: none"> • Traceability of fibre origins improves schedule of fabric tests and retailer approval for fabric [S6]; sub-suppliers' facilities [S7]

<p>for all suppliers regardless of location. (Control)</p> <ul style="list-style-type: none"> Suppliers' ability to reach the best local sources for designers, fabric sourcing, testing & machinery parts avoid peak times delays. (Critical path) Costly relations with sustainable suppliers need funding & transparency. (Communication) Shift from private label to branded products tests communications in sustainable product. (Commercial) 	<ul style="list-style-type: none"> Fast production reduces waste and returns, by enhancing product assortment and quantity [S6] Location reduces logistics carbon footprint [S7] and lead-time [S9], but product design and longevity contribute to it [S7] Retailer's demand forecasting guides us to provide suitable designs and arrange fabric sourcing in advance [S8] and after-sales feedback guides future SPD developments [S8] Lead-time performance is enhanced by seeing the retailer's inventory in real time [S10]; approval of supplier's integrated facilities [S7]; proximity of sub-suppliers [S9] Sustainability conditions have to be satisfied, otherwise, no step forward with the retailer [S9]
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Table 3 Company Profiles and Participants

Suppliers [S] Retailers [R]	Participants' roles	Activity	Relationship category
S1	Production Manager	Clothing manufacturer	Uniform asymmetry
S2	Commercial director	Knitwear manufacturer	
S3	Designer/garment technologist	Garment manufacturer	
S4	Design manager	Knitwear manufacturer	
S5	Owner	Yarn/fabric manufacturer	
S6	Designer/garment technologist	Knitwear manufacturer	Co-existing asymmetry
S7	Knitwear manager	Menswear manufacturer	
S8	Design/sales director	Knitwear manufacturer	
S9	Technical director	Dyeing/finishing	
S10	Design director	Clothing manufacturer	
R1	Buyer	Mid-market clothing retailer	Uniform asymmetry
R2	Buying manager	Mid-market clothing and textiles retailer	Co-existing asymmetry

