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OMNI-CHANNEL RETAILING: SUPPLY CHAIN DISRUPTION MITIGATION AND RECOVERY IN THE SOUTH AFRICAN FASHION RETAIL INDUSTRY

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Abstract

The Coronavirus (COVID-19) pandemic has generated a notable increase in the demand for online shopping, driving the global adoption of an omni-channel (OC) strategy by retailers. While it is well established that supply chain mitigation capabilities and recovery strategies can minimize the impact of supply chain disruptions (SCDs), it has not been explored in the increasingly relevant OC context. The purpose of this study was to explore the SCD mitigation capabilities and recovery strategies present in the South African OC fashion retail industry. The study was conducted among senior supply chain managers employed by OC retailers in South Africa. A generic qualitative design was employed to collect data through semi-structured interviews with fifteen participants. A thematic analysis approach was used to analyze the data. This study identified the types and causes of OC-related SCDs that produce the negative effects associated with an OC retailing strategy. The findings showed that South African OC fashion retailers do not engage in the most effective SCD mitigation and learning practices evident in the literature. Furthermore, the findings also revealed that OC retailers' multiple touchpoints can aid SCD recovery efforts by transferring order fulfilment between its online and offline channels. This study provides managers with an understanding of the nature of OC-related SCDs that can be used to reduce their negative effects or prevent their occurrence altogether. Managers should revisit their SCD mitigation capabilities and learning techniques to improve supply chain resiliency.

Keywords: Supply Chain Disruption, Disruption Mitigation, Disruption Recovery, Omni-Channel, Fashion Retail Industry, Qualitative Research, South Africa

1. Introduction

The recent COVID-19 pandemic has highlighted how vulnerable organizations are to unexpected disruptions as organizations across the globe attempt to recover (Ketchen and Craighead, 2020). The pandemic has placed supply chain management in the spotlight because of the challenges

global supply chains faced to deliver vital goods and services (Mollenkopf *et al*. 2020). SCDs are unexpected events that interrupt the normal flow of goods within the supply chain and threaten the normal operations of supply chain partners (Scheibe and Blackhurst, 2018). It is well established that SCDs can have severe short- and long-term negative consequences for supply chain partners, including financial loss, reduced productivity and reputational damage (Azadegan *et al.* 2020; Bode and Macdonald, 2017; Paul *et al.* 2019). Therefore, it is imperative that organizations return their supply chains to normalcy as quickly as possible through effective SCD mitigation and recovery capabilities to minimize the potential damage of such events (Singh and Singh, 2019). This is especially important for the fashion retail industry where supply chains are characterized as full of complexity due to demand uncertainty and wide product ranges (Antomarioni *et al.* 2017).

An increasing number of retailers have adopted both offline and online channels to pursue sales in the growing online retail market (Song *et al.* 2019; Wagner *et al.* 2020). These retailers are more frequently using an OC retailing strategy where online and offline retail channels are integrated to provide customers with a uniform view of an organization's product, allowing them to move freely between the channels (Liu *et al.* 2020). OC retail supply chains are also considered to be notably complex and difficult to manage due to the need for involvement and integration of multiple channels, extensive inventory management, information technology solutions, as well as multiple touchpoints in the return process (Aiolfi and Sabbadin, 2019; de Borba *et al.* 2020; Mirzabeiki and Saghiri, 2020; Simone and Sabbadin, 2017). As OC retailers already experience difficulties due to such a complex supply chain, it needs to minimize the possibility and effects of SCDs through building a resilient supply chain (Singh and Singh, 2019). Tukamuhabwa, *et al.* (2015), defines supply chain resilience as "… the adaptive capability to prepare for and/or respond to disruptions, to make a timely and cost-effective recovery …" When an OC-related SCD occurs, timely communication between the retail channels should take place to allow the organization to collectively allocate resources and ensure a more effective response (Chen *et al.* 2019). Once the disruption is fully resolved, OC retailers can take one last step to improve their supply chain resiliency through reviewing its disruption response to learn from it (Behdani *et al.* 2019). This enables OC retailers to proactively build capabilities that may reduce the likelihood and severity of similar OC-related SCDs in the future (Ambulkar *et al.* 2015).

Adopting an OC retailing strategy has become an increasingly popular option among retailers (Liu *et al*. 2020; Song *et al.* 2021). However, it is evident that there are three notable gaps in the literature on OC retailing in a SCD context. First, while SCDs have received extensive research and analysis, few studies focus on the SCDs that retailers, who specifically employ an OC retailing strategy, may experience (Lücker *et al.* 2019; Xu, *et al.* 2020). This represents a concerning gap in knowledge as an organization needs to understand the nature of a disruption to effectively manage and respond to it (DuHadway *et al.* 2019).

Second, despite the abundance of literature on building a resilient supply chain, a thorough search through academic databases determined no studies directly explore how OC retailers can better mitigate and recover from SCDs (Datta, 2017; Kochan and Nowicki, 2018). This reveals a deficiency in the body of knowledge of supply chain resiliency in OC retailers' supply chains, as resiliency is crucial in managing complex supply chains (Mirzabeiki and Saghiri, 2020). The complexity of OC supply chains makes OC retailers more vulnerable to SCDs and should therefore be understood thoroughly (Revilla and Sáenz, 2017). Furthermore, there is still considered to be a lack of research on OC retailing in developing countries, such as South Africa (Tukamuhabwa *et al.* 2017). The South African context further exacerbates OC fashion retailers' vulnerability to SCDs due to characteristics such as a limited skilled workforce, frequent power outages, poor transport infrastructure and internet connectivity issues (Heyns and Luke, 2019; Parker and Ameen, 2018; Sohrabpour *et al.* 2012; Tukamuhabwa *et al*. 2017). Third, SCD learning is considered to play an important role in developing supply chain resilience (Messina *et al.* 2020). Utilizing knowledge gained after a SCD is necessary to prevent organizations from making the same mistakes during future disruption responses (Srinivasan and Swink, 2018). However, no studies could be found that investigate how OC retailers utilize their insight gained from SCD learning to prepare for future SCDs.

The purpose of this generic qualitative study was to explore SCD mitigation and recovery amongst OC fashion retailers in the South African context. More specifically, this study explored: the nature of the OC-related SCDs they experience; the SCD mitigation capabilities they possess; the recovery strategies they typically implement in response to a SCD; and how they utilize knowledge gained after resolving a disruption to better prepare for future SCDs. Data was collected through semi-structured interviews with senior supply chain professionals employed by South African OC fashion retailers. This study aimed to answer the following research questions:

- What is the nature of omni-channel related supply chain disruptions that South African omni-channel fashion retailers face?
- What supply chain disruption mitigation capabilities do South African omni-channel fashion retailers possess?
- What supply chain disruption recovery strategies do South African omni-channel fashion retailers consider?
- How do South African omni-channel fashion retailers utilize post-disruption recovery knowledge to prepare for future supply chain disruptions?

The contribution of this study is threefold. First, the study expands on literature by identifying the types, causes and effects of OC-related SCDs. By shedding light on these OC-related SCD factors, managers can take steps to reduce their impact or prevent their occurrence. Second, this study found that South African OC fashion retailers do not engage in the most effective SCD mitigation and learning practices found in the literature. Managers should therefore reconsider their practices to improve supply chain resiliency. Last, this study adds to the literature by identifying that multiple touchpoints in an OC retailing strategy can enhance SCD recovery efforts.

The remainder of this article is structured as follows. The next section reviews the relevant literature. This is followed by a discussion of the methodology applied in this study, after which the findings are presented. The article concludes with a summary of the findings, possible theoretical and managerial implications, the study's limitations, and recommendations for future research.

2. Literature review

2.1. The South African fashion retail industry

The fashion retail industry is the second largest retail industry in South Africa, contributing roughly 2.5% to South Africa's gross domestic product and employing approximately one hundred eighty thousand people (Statistics South Africa, 2021). South African fashion retailers are increasingly importing their products due to the rising cost of locally manufactured products, creating challenges such as long lead times and the management of an extended supply chain (Muhwati and Salisbury, 2017). The South African fashion retail industry is also diverse and highly competitive, consisting of a few major retail groups. E-commerce fashion retail sales in South Africa have experienced steady growth over the last decade but have increased substantially after the COVID-19 pandemic (Deloitte, 2021). Fashion retailers typically sell a large variety of unique consumer products characterized by their short-life cycles, impulsive purchases, and high demand volatility (Jin and Shin, 2020). The significant demand uncertainty often results in fashion retailers experiencing high levels of product obsolescence, customer returns, stockouts and inaccurate forecasts (Nucamendi-Guillén *et al.* 2018). Fashion retailers frequently have difficulty in selecting the correct merchandise styles at the correct quantity for the near future (McMaster *et al.* 2020). The markdown ratio is also notably higher compared to other industries, with mid-season and end-of-season sales being a common occurrence (Jin and Shin, 2020). This contributes to fashion retailers' slim profit margins, which supply chain practitioners are constantly looking to combat by reducing costs wherever possible (Allen, 2019).

2.2. Challenges of omni-channel retailing

Most of South Africa's large brick-and-mortar fashion retailers have developed some form of e-commerce capability and employ an OC retailing strategy (Goga *et al.* 2019). An OC retailing

strategy aims to increase customer satisfaction, improve brand loyalty levels, create supply synergies between channels and reduce the organization's overall logistics costs (Jocevski *et al.* 2019; Kembro and Norrman, 2019; Larke *et al.* 2018). However, using an OC retailing strategy could lead to several negative outcomes for OC retailers. Conflicts between the different retail channels can occur due to channels sharing inventory to meet the broader organization's demand (Simone and Sabbadin, 2017). Conflict can be attributed to the possibility of a channel experiencing stock availability issues and loss of sales due to fulfilling the demand of another channel (Peinkofer, 2016). Furthermore, data discrepancies between channels regarding inventory availability can occur (Sharma *et al.* 2019). This may lead to order unfulfillment and low customer satisfaction levels (Mirzabeiki and Saghiri, 2020; Peinkofer, 2016). The product returns process for organizations that use an OC retailing strategy can be complex due to the multiple ways for customers to process a return (Jocevski *et al*. 2019). To exacerbate this complexity in a fashion industry context, fashion retailers experience a large percentage of online product returns as consumers have not had the opportunity to physically review the product (Aiolfi and Sabbadin, 2019). High volumes of returns through a complex OC structure may result in stock pileups, excessive inventory cost and slow customer return process times (de Borba *et al*. 2020).

2.3. Supply chain disruptions

SCDs are commonly described as "unplanned events that impede or stop the flow of materials, information, services or financial resources within and between the organizations of a supply chain involved in producing a good or service" (Porterfield *et al.* 2012). It is well established that organizations which experience SCDs may face a decrease in operational and financial performance (Shen and Li, 2017). SCDs are often classified into three broad categories that specify the location of the disruption relative to the organization, namely, endogenous, exogenous, and environmental (Huq *et al.* 2016). Endogenous SCDs occur within the focal organization; exogenous SCDs occur within the broader supply chain network; and environmental SCDs occur external to the supply chain network of the focal organization (Macdonald and Corsi, 2013). It is also evident that SCDs have been classified according to causation, more specifically whether a disruption resulted from intentional or unintentional human actions, or from natural disasters, such as floods, earthquakes, and hurricanes (Shen and Li, 2017). Intentional SCDs refer to disruptions that take place because of the deliberate behavior by people at the source of the disruption, for example theft and fraud; whereas unintentional SCDs are inadvertent man-made disruptions that occur without an active decision to cause the disruption, such as power outages and industrial accidents (DuHadway *et al*. 2019).

2.4. Supply chain disruption management

Supply chain disruption management (SCDM) is referred to as "... a structured and continuous process to analyze the impact of disruptions across the supply chain on predefined objectives and to handle them in their entire lifecycle" (Behdani *et al*. 2012). The SCDM process predominately involves an organization's reactive handling of a SCD and is necessary to ensure supply chain resiliency (Chang *et al.* 2015). SCDM includes three steps, namely, SCD mitigation, SCD recovery and SCD learning reviewed in the following sections.

2.4.1. Supply chain disruption mitigation

SCD mitigation entails SCD readiness, SCD detection, and limiting the initial impact through an immediate SCD response. Supply chain mitigation capabilities are defined as "the organizational routines or regular and predictable patterns of activity, and sequence of coordinated actions that enhance the abilities of the supply chain to recover expediently from a manifested disruption and to create awareness of a pending or realized disruption" (Blackhurst *et al.* 2005). Organizations are often knowledgeable about the potential effects that SCDs can have on a supply chain but have not acted to mitigate it (Bowman, 2015). This is because supply chain managers frequently

do not believe that the benefits of implementing SCD mitigation capabilities outweigh the costs involved (Parast and Shekarian, 2019).

2.4.1.1. Supply chain disruption readiness

There are several ways that organizations can improve their disruption readiness. Supply chain managers must be ready to act when a SCD strikes by knowing precisely what their roles and responsibilities are during a response (Bode and Macdonald, 2017). Clearly established routines and practice of these routines in simulated SCD scenarios are a critical component in the effectiveness of an organization's SCD readiness (Scholten *et al.* 2014). These routines should be formulated through written steps and act as the standard protocol for supply chain managers and other employees to follow in the event of a SCD (Bowman, 2015). The literature on SCD readiness commonly refers to three policies that organizations can employ to improve the state of their supply chain in preparation for a disruptive event. The first policy is to use an effective means of communication that facilitates timely and accurate information sharing between all supply chain partners to enable early detection of SCDs (Chen *et al.* 2019). However, Richey *et al.* (2009) warn that sharing too much information may decrease its usefulness and importance. The second policy involves keeping strategic inventory reserves to prevent stockouts during a SCD (Son and Orchard, 2013). The third policy is having back-up suppliers on standby who can guarantee an agreed upon level of additional capacity during a SCD (Sawik, 2017).

2.4.1.2. Supply chain disruption detection

The first act of an organization after the occurrence of a SCD is the detection thereof. Early detection of a disruption allows organizations to act quickly and minimize the SCD's potential effects on the supply chain (Sheffi, 2015). Organizations can take either an active or passive approach to SCD detection. Active organizations constantly monitor and evaluate the supply chain environment in which they operate, therefore, increasing the probability of early SCD detection (Bode *et al.* 2011). In contrast, passive organizations are less attentive and are usually reluctant to conduct active information searches, resulting in later than optimal detection of a SCD (Zhou and Wang, 2015).

2.4.1.3. Supply chain disruption initial response

An organization's first actions and decision-making speed in its initial response to a SCD are crucial to successfully mitigate initial SCD effects (Chen *et al.* 2019). Existing response plans and routines should be the primary basis for how organizations react to SCDs, as they save time in the crucial early phases after a disruption (Behdani *et al.* 2012). It is recommended that the affected supply chain partners' first act in their planned response entails the development of response teams (Al-Mansour and Al-Ajmi, 2020). These teams represent the various functions within the organization and the organization on a supply chain level. Furthermore, they are responsible for information analysis, decision making, and communication with other relevant parties during a SCD (Macdonald and Corsi, 2013). Response teams, must first, gather any relevant information about the SCD and the state of the supply chain (Bode and Macdonald, 2017). Thereafter, they should analyze all the applicable information to determine what course of action to take (Dubey *et al.* 2021). Response teams must also quickly determine who it needs to share the information with and continue to feed information to these parties in real-time to create a greater level of visibility throughout the supply chain (Revilla and Sáenz, 2017). Information sharing also forms the basis of collaboration, which is commonly stated in literature as a useful tool to mitigate the effects of SCDs (Dubey *et al.* 2021). The ability for different internal functions and supply chain partners to work well together during a disruptive event can improve the quality of the SCD response and overall recovery process (Scholten *et al.* 2014).

2.4.2. Supply chain disruption recovery

An organization's SCD readiness and initial response could be insufficient in resolving a disruption (Dolgui *et al.* 2018). Therefore, it may be necessary for organizations to develop alternative solutions to fully recover from a SCD and return the supply chain to a state of normalcy (Bowman, 2015). In the SCD literature, this is commonly referred to as the recovery phase (Messina *et al.* 2020; Piprani, 2020).

2.4.2.1. Supply chain disruption recovery process

The recovery phase is largely concerned with resource reconfiguration which is "... the ability to reconfigure resources with timeliness and efficiency in order to deploy a new configuration that matches the new environment" (Ongkowijoyo *et al.* 2020). The ability to reconfigure resources effectively and quickly in a volatile environment is crucial to an organization's long-term survival and growth (Kwak *et al.* 2018).

The process to successfully allocate resources to recover from a SCD includes three phases: determining the alternative recovery options, selecting and implementing the most appropriate option, and continuously gathering information whilst monitoring the SCD (Behadni, 2013). Organizations should start developing alternative recovery options parallel to implementing their initial response to be ready if a comprehensive recovery process is required (Chang *et al.* 2015). Subsequently, organizations must analyze and implement the most suitable options whilst considering implementation time and cost in an iterative process that should be repeated until the supply chain is returned to its normal state (Behdani, 2013). An organization will likely experience more severe SCD effects the longer the resolution process takes (Paul *et al.* 2018). Lastly, a SCD can be dynamic and unpredictable, and may change its state frequently (Golgeci and Ponomarov, 2013). Therefore, organizations must closely monitor the SCD situation and relay new information to the relevant supply chain partners as quickly as possible (Ongkowijoyo *et al.* 2020).

2.4.1.3. Admission of fault during supply chain disruption recovery

If a function or supply chain partner is responsible for causing a SCD, admission of fault is crucial to the recovery process (Porterfield *et al.* 2012). There is a possibility of reputational damage and relational conflict between the responsible party and their counterparts upon admission of fault (Meng, 2012). However, self-admission by the responsible party will prevent the potentially long and complex process of determining the SCD root cause and avoid unnecessary cost overruns or delays in the SCD recovery process (Macdonald and Corsi, 2013). Furthermore, admission of fault could prevent a blame culture that leads to dysfunction within the various response teams involved in the SCD recovery process, hindering the overall SCD recovery effort (Meng, 2012).

2.4.3. Supply chain disruption learning

Once an organization has fully resolved a SCD situation, organizations should review its handling of the disruption and capture the lessons learnt during the last phase of the disruption management process, SCD learning (Behdani *et al.* 2019).

2.4.3.1. Supply chain disruption orientation

The characteristic that organizations should possess to engage in effective SCD learning is that of being SCD oriented, whereby organizations are eager to learn from SCDs to reduce the severity of similar disruptions in the future (Ivanov and Dolgui, 2020). SCD orientation is defined as "a firm's general awareness and consciousness of, concerns about, seriousness toward, and recognition of the opportunity to learn from supply chain disruption" (Bode *et al.* 2011). Given that SCDs are increasingly frequent, organizations need to be SCD oriented to accumulate valuable lessons and ultimately increase their supply chain resiliency (Jacobs *et al.* 2019).

2.4.3.2. Analyzing supply chain disruptions

A SCD, despite its potential for negative consequences, gives organizations the unique opportunity to analyze the effectiveness of existing SCD response plans against a real scenario (Bode *et al.* 2014). This analysis can help to expose weaknesses in the organization's SCD response plans (Pettit *et al.* 2019). Similarly, this analysis may show organizations the strengths of their existing SCD response plans, which can form the basis for new and improved response plans (Brown, 2019). To discuss and document any lessons learnt after resolving a SCD, organizations should set aside time for brainstorming meetings where response teams consider suitable amendments to their future SCD handling (Behdani, 2013). These changes can range from adjustments to supply chain processes to modifying strategic decisions (Ambulkar *et al.* 2015). Supply chain partners should participate in these discussions to facilitate joint learning, thereby increasing the SCD knowledge of the entire supply chain (Ali *et al.* 2017).

There are two wide-spread behavioral approaches to SCD learning that organizations can seek to take. The first approach is called single-loop learning, which focuses on making small, incremental corrections to shortcomings in an organization's SCD recovery process by using existing supply chain assumptions and norms (Azadegan *et al.* 2019). The second approach is double-loop learning, whereby organizations make drastic changes to fix the underlying problem in the organization's disruption response (Adobor and McMullen, 2018). Furthermore, it is advised that organizations take an approach based on information processing to analyze data accurately and reliably due to the large volumes of data present in modern supply chains (Srinivasan and Swink, 2018). Organizations must possess the ability to acquire, process and interpret relevant SCD data if it wants to learn through an information processing-based analysis (Kache and Seuring, 2017). Therefore, organizations should obtain appropriate information technology infrastructure and information system software to enable this SCD learning approach (Dubey *et al.* 2021).

3. Methodology

This study employed a generic qualitative research design to obtain an in-depth understanding of participants' perspectives and experiences regarding SCD mitigation and recovery phenomenon in a real-life setting (Doyle *et al.* 2020). This study was conducted in the OC fashion retail industry, as the complexity and high likelihood of SCDs are suitable for information-rich SCD-related data (Antomarioni *et al.* 2017). The units of analysis for this study were the South African OC fashion retailers; and the units of observation were the senior supply chain managers employed by these retailers. Fifteen organizations participated in this study, each with one individual with whom a semi-structured interview was conducted. The final sample size was based on the data saturation principle, whereby data is continuously collected until no new codes or themes relevant to the study's topic are discovered in new participants (Fusch and Ness, 2015). Data saturation occurred after 12 interviews and no new significant data was found in the three interviews conducted thereafter.

Homogenous sampling, a form of purposeful sampling, was adopted to select firms and participants who all possess characteristics adhering to specific inclusion criteria (Benoot *et al.* 2016). The homogenous sampling method was chosen as it allows for a deeper understanding of the investigated phenomenon due to a reduction in variability of a study's sample (Isaacs, 2014). Participating organizations had to sell fashion-related products directly to South African customers through online and physical retail stores to ensure relevant findings. Furthermore, organizations were required to have a geographical footprint in main centers throughout South Africa so that their operations possessed a heightened level of complexity for information-rich purposes. Organizations should also have experienced SCD in the two years preceding the interview which allowed employees to clearly recollect at least one disruptive event.

The individual participants required at least five years of experience as a senior supply chain professional which ensured that the participant had sufficient supply chain experience and knowledge to make a valuable contribution to the study. Furthermore, the participant had to hold a senior position with the authority to make strategic decisions regarding their organization's SCD

mitigation and recovery. This ensured that participants understood the reasoning behind different SCD mitigation capabilities and recovery strategies. Participants also had to have been engaged in the mitigation and recovery of a SCD in the last two years whilst being employed by the relevant organization. This ensured their understanding on how their specific organization approaches SCD mitigation and recovery. Table 1 presents the details of the participants.

Table 1. Profile of the study's participants

Participant	Position	Gender	Organization	Length of interviews (minutes)
P1	Head of distribution	Male	O1	43
P2	Head of logistics	Male	O2	25
P3	Head of supply chain	Male	O3	35
P4	Supply chain executive	Male	O4	33
P5	Vice president for e-commerce	Male	O5	38
P6	Head of supply chain	Male	O6	28
P7	Global head of procurement	Male	O7	37
P8	Managing director	Male	O8	30
P9	Head of operations South Africa	Male	O9	31
P10	Country manager	Male	O10	44
P11	Head of operations South Africa	Female	O11	37
P12	Head of logistics	Male	O12	37
P13	Head of e-commerce and supply chain	Male	O13	40
P14	Head of supply chain Southern Africa	Male	O14	48
P15	Head of operations South Africa	Female	O15	44
Average interview length:				37

Source: Authors' own compilation

Fifteen online semi-structured interviews were conducted as the study's data collection method. Semi-structured interviews allowed the researchers to gain detailed insight from particpants on the study's topic (Patton, 2015). A discussion guide was developed after a thorough review of the literature. An interview with an individual who matched the study's inclusion criteria was used to pre-test the discussion guide. Thereafter, only minor amendments were made to the discussion guide. All interviews were conducted over a video conferencing software due to the COVID-19 pandemic. Prior to every interview, all participants read and signed the informed consent form, were informed that their answers and identities were to be kept confidential and granted the researchers permission to video record the interview. The interviews lasted from 25 minutes to 48 minutes with an average length of 37 minutes. The researchers transcribed each interview within three days of the respective interview and listened to each recording twice and amended any errors in the transcriptions.

This study analyzed the data collected by conducting a thematic analysis that entails a coding process to identify, organize and report the themes found within a data set (Braun and Clarke, 2012). Atlas.ti version 9 was used for the coding and analysis process. Initially, the researchers conducted an exploratory analysis by reading the amended transcriptions whilst listening to the video or audio recordings to become accustomed to the data and to allocate preliminary inductive codes (Creswell, 2012). A text segment was assigned to each code to summarize its meaning and to ensure coding consistency. Thereafter, a master code list was compiled, and redundant codes were merged accordingly (Braun and Clarke, 2012). Subsequently, patterns were identified to establish sub-themes and themes applicable to the study's research questions (Braun and Clarke, 2012).

This study adopted the trustworthiness criteria developed by Lincoln and Guba (1985), to ensure the study's credibility, dependability, confirmability, and transferability. To ensure credible responses, participants were assured of the confidentiality of their responses and identity before

the interview commenced; and were reminded that they could refrain from answering any of the questions (Baxter *et al.* 2015). To ensure dependability this study included an audit trail with detailed records regarding the researcher's choices and implementation of the study's research procedures and methodology (Anney, 2014). Confirmability was achieved by using open-ended questions during the interviews to prevent researcher bias from influencing the participants (DeJonckheere and Vaughn, 2019). Furthermore, interviews were transcribed with attention to detail, ensuring accurate findings (Milne and Oberle, 2005). Transferability was established by a comprehensive description of the study's context, applied methodology, participant details and inclusion criteria (Yilmaz, 2013).

Prior to every interview, participants were required to read and sign the informed consent. This form highlighted that participation in the study was voluntary, indicated that participants could withdraw from the study at any time, and assured confidentiality and anonymity. The latter was attained using pseudonyms.

4. Findings

This study identified four main themes related to the study's research questions: the nature of OC-related SCDs, SCD mitigation capabilities, SCD recovery strategies and SCD learning capabilities. The discussion of the main themes and their respective sub-themes in this section are supported by descriptive participant quotations. Table 2 illustrates the linkage between the themes, sub-themes, and codes.

Table 2. Summary of themes, sub-themes and codes

	Themes			
	The nature of OC-related SCDs	**SCD mitigation capabilities**	**SCD recovery strategies**	**SCD learning capabilities**
Sub-themes	**OC-related SCD types:** - Cross-channel inventory data discrepancies - Inventory unavailability at one channel - Unwanted cross-channel reverse logistics - Rapid demand shift to online **OC-related SCD causes:** - Poor system integration - Staff inventory handling errors - Lack of communication between channels - Inaccurate inventory allocation and forecasting - High reverse logistics costs - COVID-19 Pandemic **OC-related SCD:** - Negative financial implications - Conflict between channels - Reputational damage - Inaccurate inventory replenishment - Stock pileups	**Readiness:** - Develop business continuity plan - Increased stock availability - Secure additional operational capacity - Under promise service levels to customers - Does not prepare for SCDs **Detection:** - System data indicators - Informed by customers - Informed by supply chain partners **Initial response:** - Implement business continuity plan - Formulate disruption management team - Gather useful information - Determine SCD impact - Prioritize online channel inventory availability	- Monitor SCD and update plan - Transfer order fulfilment between channels - Use alternative mode of transportation - Use alternative suppliers - Collaboration with external supply chain partners during disruption - Communication with external supply chain partners during disruption	**SCD learning techniques:** - Approach to learning - Debate and post-mortem discussion - Data analysis methods - No engagement in SCD learning **SCD learning implementation:** - Adapt business continuity plan - Amend supply chain procedures and/or strategy - Create new key performance indicator(s) - Incremental changes - Reliance on employees to remember and adapt - External supply chain partners involvement

Source: Authors' own compilation

4.1. Theme 1: the nature of omni-channel related supply chain disruptions

The first theme links to research question one as it entails the nature of OC-related SCDs that South African OC fashion retailers face. This theme includes three sub-themes, namely, the type, causes and effects of OC-related SCDs.

4.1.1. Types of omni-channel related supply chain disruptions

This study identified several types of OC-related SCDs in the South African retail industry. Firstly, nine participants indicated that they experience cross-channel inventory data discrepancies. This is due to their systems for the online and brick-mortar channel containing contradictory data on the same inventory. This can be seen in the following quotation:

> "… if a customer sees something online, they want it instantaneously when they walk into a store, or they see something in-store, but they want to buy it online, but they cannot, in that case, that is due to those systems not being fully integrated …" (P13, male, head of e-commerce and supply chain)

Furthermore, seven participants described facing inventory unavailability at one channel. OC fashion retailers' customers may be unable to purchase inventory from either the online or brick-and-mortar channel due to a stockout, whilst that same stock keeping unit is available for purchase at the other channel. The quotation below supports this point:

> "… they might see a product in store, but they cannot find it online or vice versa …" (P13, male, head of e-commerce and supply chain)

Moreover, unwanted cross-channel reverse logistics is another OC-related SCD, stated by four participants. Customers may return goods, purchased on an OC fashion retailer's online store, to one of the organization's brick-and-mortar stores, as opposed to processing their return with the online, more streamlined channel. This is evident in the following quotation:

> "… the typical challenge we have is somebody purchasing something online and then wanting to return it in-store …" (P10, male, country manager)

A rapid shift to online was highlighted as an OC-related SCD by seven participants. OC fashion retailers may experience a notable increase in their e-commerce traffic over short period of time, whilst simultaneously experiencing a notable drop in brick-and-mortar foot traffic. This is illustrated as follows:

> "... we saw a huge uptick in our online orders … while brick-and-mortar fell off the cliff ..." (P6, male, head of supply chain)

4.1.2. Causes of omni-channel related supply chain disruptions

Multiple causes of one or more OC-related SCDs were found. First, poor system integration was identified as the most common cause of cross-channel inventory data discrepancies. Six participants described a rudimentary inventory system, which requires the manual entry and transmission of data between channels. The quotation below supports this point:

> "… someone was manually extracting data, sending it over … they were tidying it and loading it up, it was not a beautiful automated system …" (P3, male, head of supply chain)

Furthermore, staff inventory handling errors was also determined to be a cause of cross-channel inventory data discrepancies, mentioned by three participants, due to warehouse staff incorrectly packing inventory that is bound for brick-and-mortar stores. This results in the brick-and-mortar store holding inventory that differs from the system's inventory data, providing customers with inaccurate information on inventory availability. This can be seen in the following quotation:

> "… where the staff part goes wrong is the initial packing of boxes … so your system expects maybe two smalls … but you have four mediums." (P12, male, head of logistics)

A lack of communication between channels was found to be another cause of inventory data discrepancies, indicated by three participants. This is due to the online or brick-and-mortar channel failing to provide inventory-related data to the other channel before it was required to fulfil a customer's order, as shown in the quotation below:

> "… we should be able to fulfil that product that we have in the store around the corner … there is a delivery delay issue when your two channels in an online, offline sense are not fully communicated." (P13, male, head of e-commerce and supply chain)

Four participants mentioned that inventory unavailability at one channel was caused by inaccurate inventory allocation and forecasting. OC fashion retailers may not be able to assign their available inventory in a proportionate manner that closely matches the demand of their online and brick-and-mortar channels, due to fluctuating cross-channel demand levels. The quotation below illustrates this point:

> "… retail spending patterns have changed so fundamentally and significantly from the historical data that it is very difficult to try and anticipate demand …" (P4, male, supply chain executive)

Furthermore, high reverse logistics cost was highlighted by three participants as causing unwanted cross-channel reverse logistics. This is because there is a high-cost barrier of reintegrating inventory, that was purchased online and returned to brick-and-mortar stores, into the warehouse of origin, as shown in the quotation below:

> "… it is certainly possible to return that stock back to the warehouse, it is just too costly." (P10, male, country manager)

Lastly, it is evident that the COVID-19 pandemic is the cause of the rapid demand shift to online OC-related SCD, as indicated by six participants. This is because the local COVID-19 commercial lockdown regulations resulted in OC fashion retail brick-and mortar stores closing temporarily, forcing customers to shop online. This is evident in the following quotation:

> "… when COVID hit, what fundamentally happened is most stores went into lockdown. So physical brick-and-mortar sites were not operational ... and it forced a shift towards online." (P7, male, global head of procurement)

4.1.3. Effects of omni-channel related supply chain disruptions

Various effects resulting from one or more OC-related SCDs were identified. First, six participants described negative financial implications as an effect of cross-channel data inventory discrepancies. A loss of sales results when a system does not indicate inventory as available to customers, when in fact the inventory is in-stock at one of the channels. This is evident in the following quotation:

> "… we had then also a bit of a stock situation with the inventory where our online stores were allocated, but then the stock was not available. So, we had to do a lot of work on keeping our stock accurate." (P15, female, head of operations South Africa)

Seven participants indicated that inventory unavailability at one channel also resulted in negative financial implications. Customers will not wait for a product to become available at their preferred channel, and will instead take their business to a competitor, resulting in a loss of sales. The quotation below illustrates this point:

> "… it is a lost sale. Customers want an immediate fulfilment of the garment that they came to purchase, or they are going to substitute that purchase elsewhere to a competitor." (P4, male, supply chain executive)

Moreover, a rapid shift to online was also identified as resulting in negative financial implications indicated by four participants. The online channel of South African OC fashion retailers traditionally account for a small percentage of total sales, resulting in the need for heavy investment at short notice to expand the online channel to accommodate the increased demand for online shopping. This can be seen in the following quotation:

> "In the South African environment, we had close to a 200% increase in online … has literally forced the development or the fast tracking of an online strategy." (P7, male, global head of procurement)

Conflict between channels was mentioned by three participants as another effect of a rapid shift to online. This conflict results from each channel attempting to secure the OC fashion retailer's limited inventory, as indicated in the quotation below:

> "… they are very much like, no, I am not giving my stock to e-comm because e-comms is stealing my sales." (P11, female, head of operations South Africa)

Another effect of cross-channel inventory data discrepancies is reputational damage, as indicated by 10 participants. An OC fashion retailer's brand image is negatively affected when customers are misled regarding the availability of inventory, resulting in order unfulfillment: This can be seen in the quotation below:

> "… it is reputational damage because you become known for incomplete order fulfilment … customers write you off as a poor fulfiller." (P12, male, head of logistics)

Inaccurate inventory replenishment was mentioned by two participants as another effect of cross-channel inventory data discrepancies. Inventory that is replenished against inaccurate system data results in the under or over-replenishment of inventory for the online or brick-and-mortar channel. The following quotation shows this point:

> "… the upstream supply chain is replenishing stock against what the system is saying, not what might be physically there." (P5, male, vice president of e-commerce)

Furthermore, two participants highlighted stock pileups in brick-and-mortar stores as an effect of unwanted cross-channel reverse logistics. Customers returning online-bought inventory to brick-and-mortar stores may result in an unwanted surplus of inventory that is difficult to integrate into the respective store. This is evident in the following quotation:

> "Now you suddenly got an odd size or a bunch of odd sizes that do not really map back to your original merchandising plans." (P10, male, country manager)

These findings confirm several potential negative effects for organizations that engage in an OC retailing strategy that is found in the literature, namely, conflict between channels, reputational damage, and stock pileups at brick-and-mortar stores (de Borba *et al*. 2020; Melacini *et al*. 2018; Mirzabeiki and Saghiri, 2020). Adding to the literature, this study has found new potential negative effects, including, negative financial implications and inaccurate inventory replenishment. Furthermore, the financial implications due to the rapid demand shift to online OC-related SCD caused by COVID-19 was found to be context-specific, as South Africa's OC fashion retailers were slow adopters of the online channel prior to the pandemic. This study also expands upon the existing literature by identifying the specific endogenous OC-related SCDs that result in these effects and the causes of these SCDs, currently not available in the literature.

4.2. Theme 2: supply chain disruption mitigation capabilities

The second theme links to research question two as it involves the SCD mitigation capabilities possessed by South African OC fashion retailers. This theme consists of three sub-themes, namely, readiness, detection, and initial response capabilities.

4.2.1. Supply chain disruption readiness

The most common SCD readiness capability that was found is the development of a business continuity plan (BCP), as mentioned by nine participants. These BCPs entail creating pre-meditated SCD response measures that OC fashion retailers employ to enable a quicker SCD. This is illustrated in the following quotation:

> "… you do the business continuity planning … to just prepare you so that if it does happen, you can get off the ground faster …" (P2, male, head of logistics)

Increasing stock availability through ordering stock early was described by five participants as another SCD readiness measure. This affords OC fashion retailers a buffer period for when a SCD and subsequent supply delays occur, as is evident in the quotation below:

> "So, they have pulled forward by nearly 45 days to allow additional time for global supply chain disruptions." (P4, male, supply chain executive)

Similarly, three participants stated that they increase stock availability through holding strategic inventory reserves that can be used to ensure continuity of supply during a SCD, as seen in the following quotation:

> "We are holding additional safety stock inside of the network, both at the raw material level and the finished goods level." (P4, male, supply chain executive)

Three participants explained that they secure additional operational capacity by having back-up computer resources. This entails the existence of redundant severs that can be utilized if the main operational system or online platform is disrupted, minimizing downtime. The quotation below illustrates this SCD readiness measure:

> "… we have got back-up service providers for our servers, that is all covered. If our head office blows up and all the people are fine, they can just log in from home." (P3, male, head of supply chain)

Furthermore, three participants mentioned that they under promise service levels to customers as a SCD readiness measure. This entails reducing customers' service level

expectations regarding delivery times to allow OC fashion retailers more time to resolve a SCD. This measure is shown in the quotation:

> "… instead of 24-hour delivery, we have asked the customer for 48 hours delivery because a lot of the times … there are emergency situations." (P10, male, country manager)

In contrast to the participants with SCD readiness capabilities, four participants indicated that they chose not to prepare for SCDs. This is because it may be unrealistic to prepare for the vast array of potential SCDs. Instead, an emphasis is placed on agility whereby OC fashion retailers employ experienced individuals who know how to quickly resolve SCDs. This can be seen in the following quotations:

> "… South Africa is quite disruptive … it is quite a volatile environment. For us to have to plan for one of those events is, to me, a bit naive. So, I would rather plan to be agile …" (P6, male, head of supply chain)
> "I think probably the best measures … is to have the right people in senior positions who can implement agility very quickly. So more than having like I said, pull out the blue envelope, you have people with experience that can quickly react and come up with a solution." (P11, female, head of operations South Africa)

4.2.2. Supply chain disruption detection

This study found multiple ways that South African OC fashion retailers detect new SCDs. Twelve participants indicated that that they utilize system data indicators to detect SCDs. These indicators allow OC fashion retailers to frequently monitor key information on the dynamic state of the supply chain in an organized manner. This SCD detection method is evident in the following quotation:

> "It is through our reporting metrics. There is a micro, granular view of the business on a daily basis, and it is these very dashboards that provides any indications of any disruption." (P13, male, head of e-commerce and supply chain)

Four participants explained that they detect SCDs through their supply chain partners informing them that a disruptive event has happened. The following quotation illustrates this detection method:

> "… often we will hear from our suppliers in the supply chain … that there is some kind of issue." (P10, male, country manager)

Lastly, four participants stated that customers may be the first to inform them of a SCD as their supply chain partners may fail to do so in a timely manner. This is indicated in the quotation:

> "… often, we will hear from … our customers that there is some kind of issue … and then a week later we will hear from the courier company saying that they had a shortage of vehicles with drivers, or a truck was hijacked or something like that. So … often customers will be the first to notify you and once you investigate that, you often find that there has been disruption." (P10, male, country manager)

4.2.3. Supply chain disruption initial response

The most frequent initial response, as indicated by nine participants, involves implementing their pre-existing BCP for a swift SCD response. This is evident in the quotation:

> "… for every type of disruption there are different plans … so, we just kick in the continuity plans and follow that." (P12, male, head of logistics)

Six participants explained that they formulate disruption management teams as one of their first SCD responses. These teams include the relevant parties that have been affected by a SCD and help enable an organized effort for resolving the disruption at hand. This is shown in the following quotation:

> "The business continuity planning process will kick in, and then there is a guidance of what team gets pulled together to manage that and who is the head of the team …" (P2, male, head of logistics)

Another SCD initial response entails gathering useful information on the nature of the SCD and on the state of the affected supply chain, as stated by nine participants. Gathering relevant information allows OC fashion retailers to engage in informed decision making and to determine the different types of resources that will be required to resolve the SCD. This is clear from the quotation:

> "… the more updated and the more detailed the information you have, the better decisions you can make to mitigate or turn the situation around. It just gives you a greater view on what resources are required to rectify, who you need to pull in …" (P10, male, country manager)

Similarly, six participants indicated that they determined the impact of the SCD as part of their SCD initial response. This helps OC fashion retailers determine the severity of a SCD and subsequently the number of resources that is required to resolve it, as is shown in the following quotation:

> "… grapple with the extent of the damage, the nature of the problem, what it takes to resolve it, what is the financial impact and then deciding on how we allocate resources … to resolving the matter. (P10, male, country manager)

Moreover, four participants highlighted the priority of the online channel's inventory availability over that of brick-and-mortar as an SCD initial response. This ensures that OC fashion retailers retain or capture market share in the online fashion industry when there is an increase in demand for online fashion shopping. This can be seen from the quotations:

> "The volume of orders that we received from an online perspective were a lot higher … we ended up taking back stock from stores to try and bolster our availability of stock online … and we took market share away from our other competitors because we had the online availability (P6, male, head of supply chain).

This study confirms the findings of Behdani (2013), indicating that organizations may not engage in SCD readiness because it is unrealistic to prepare for the wide range of potential different SCDs. Furthermore, the literature emphasizes three policies that organizations employ to prepare for SCDs, namely, establishing effective means of communication with supply chain partners, keeping strategic inventory reserves, and having back-up suppliers on standby (Chen *et al.* 2019; Sawik, 2017; Son and Orchard, 2013). However, this study only identified one of these policies, keeping strategic inventory reserves, to be evident in the South African OC fashion retail industry. Lastly, the findings of this study stating that OC fashion retailers may prioritize the order fulfilment of their online channels as an SCD initial response expands on the literature as there is no insight into how organizations react to SCDs from an OC perspective.

4.3. Theme 3: supply chain disruption recovery strategies

The third theme links to research question three as it involves the strategies that South African OC fashion retailers typically implement to recover from SCDs. First, 10 participants indicated the SCD recovery strategy of closely monitoring the SCD and updating the plans to resolve it. This strategy enables OC fashion retailers to make informed decisions on how to best amend their SCD resolution plan because up to date information pertaining to dynamic SCD scenarios is used. This strategy is evident in the following quotations:

> "… based on live data, you go in and you understand what worked, what did not work … you do a live assessment of the current situation, then based on that you rebuild your interventions." (P7, male, global head of procurement)

Another SCD recovery strategy that was mentioned by two participants is the transfer of order fulfilment between channels. An OC fashion retailer's multiple customer touchpoints allows the responsibility for order fulfilment to be transferred from one channel to another, ensuring that products reach their intended customer during a SCD. This can be seen in quotation below:

> "… it gives us alternatives and additional mechanisms to essentially reach a customer … so I think it just allows a greater number of touchpoints for the customer should there be disruption along the supply chain." (P10, male, country manager)

Furthermore, using an alternative mode of transportation was a SCD recovery strategy indicated by three participants. Switching to a faster mode of transportation can circumvent supply delays caused by a SCD, due to reduced leads times, which is evident in the following quotation:

> "If it is a disruption of lead time … one can look at alternative modes of transport, like moving from sea to air." (P4, male, supply chain executive)

Moreover, only one participant mentioned the use of alternative suppliers as a SCD recovery strategy. This entails switching to a different suitable supplier to ensure continuity of supply for the products affected by the SCD, as is shown in the quotation below:

> "If it is a disruption of supply one can look at alternative suppliers, who can make the same product, or would be on your approved vendor list." (P4, male, supply chain executive)

All participants described collaboration with external supply chain partners as crucial to SCD recovery. OC fashion retailers work together with external supply chain partners to gain new and useful knowledge that can be used to enhance its SCD recovery process. The quotations below illustrate this finding:

> "… collaboration is key … if you have the right people around the table, you are going to get a clearer, quicker response team acting to make sure that we get things resolved." (P14, male, head of supply chain Southern Africa)

Lastly, nine participants mentioned communication with all external supply chain partners to inform them of a SCD, as a recovery strategy. This gives supply chain partners the opportunity to develop proactive or reactive SCD response plans to prevent additional SCD negative effects on the greater supply chain. This is illustrated in the following quotation:

> "… we have to keep everybody informed because the customer may be expecting a driver to arrive or the warehouse may be anticipating a product to land, and if you have that disruption and you are not informing everybody, it creates further

> disruption. You have to get the communications out and be guilty of over communicating." (P10, male, country manager)

This study confirms the work of Scholten and Schilder (2015), who found that collaboration and communication with external supply chain partners is critical in recovering from SCDs. Furthermore, Larke, *et al*. (2018), found that an inherent drawback of an OC retailing strategy is that the multiple touchpoints available to customers notably increase retail operational complexity. This study expands on the OC literature by finding that multiple touchpoints can be advantageous in an OC retailer's SCD recovery process as multiple channels provide additional opportunities to fulfil customers' orders.

4.4. Theme 4: supply chain disruption learning

The fourth theme links to research question four as it involves how OC fashion retailers engage in and utilize SCD learning to enhance their preparation for future SCDs. This theme consists of two sub-themes, including SCD learning techniques and SCD learning implementation.

4.4.1. Supply chain disruption learning techniques

Several different techniques that OC fashion retailers use to engage in SCD learning were identified. First, data analysis methods were indicated by three participants as a SCD learning technique. This method employs data analytics software that analyses large volumes of data surrounding a SCD scenario helping OC fashion retailers clearly understand what aspects of their SCD handling need improvement. This technique is shown in the following quotation:

> "We have good data and good analytics tools that help us navigate the issue … we use Qlik Sense, a visualization tool. It sits on top of a sequel database which we run that churns all this data." (P5, male, vice president of e-commerce).

In addition, 10 participants stated that they conduct a debate and post-mortem discussion as a SCD learning technique. An open dialogue amongst OC fashion retailers' employees occurs to determine the effectiveness of their SCD readiness and to detail how their SCD mitigation capabilities can be improved upon. This is evident in the quotation below:

> "We do a post-mortem on what went wrong, how can we prevent it, do we need to update our plans, did our disaster recovery plans cover every aspect that we thought it needed to cover? Do we have gaps?" (P12, male, head of logistics)

Furthermore, seven participants mentioned that they conduct a root cause analysis as part of their debate and post-mortem discussion. This analysis allows OC fashion retailers to identify the source of SCDs and subsequently to develop specific solutions to prevent these SCDs from reoccurring in the future. This can be seen in the following quotation:

> "So, what is the root cause and what mechanisms, or systems or resources do we put in place to ensure that it does not simply happen again?" (P13, male, head of e-commerce and supply chain)

Lastly, only one participant mentioned that they do not engage in SCD learning in any form to prevent a blame culture within the organization, as is seen in the following quotation:

> "… when people have gone through that initial pain of something that has gone wrong, people may have felt they were unfairly picked on when it was not necessarily their fault. It is guilt, it is blame, now you fixed it, and now everybody is just done with it, we do not want to go back to that." (P9, male, head of operations South Africa)

4.4.2. Supply chain disruption learning implementation

This study found multiple ways in which OC fashion retailers utilize their SCD learnings to better prepare for future SCDs. Five participants indicated that they adapt their BCPs based on their SCD learnings to improve their SCD readiness. The quotation below illustrates this point:

> "… you would look at it and you think, did we handle it as best we could … and if there is a something you can update in your business continuity plan, then you do so." (P2, male, head of logistics).

In addition, nine participants mentioned that they implement their SCD learnings by amending their supply chain processes or strategies. These changes are meant to reduce the likelihood that OC fashion retailers' supply chain processes or strategies are the cause of SCDs in the future. This can be seen in the following example:

> "… it has caused irregularity and volatility in shipping routes and then it has caused a massive increase in supply chain costs ... and what we have done is we have adopted multiple strategies to try and address those supply chain disruptions. The one is an intent to drive more locally manufacturing ..." (P7, male, global head of procurement)

Furthermore, four participants explained that they create a new key performance indicator to implement their SCD learnings. This enables OC fashion retailers to accurately monitor the metrics and performance of SCD readiness changes in combating future SCDs. This can be seen in the following quotation:

> "… there is always a measure to it. So, it is not like, the fix must be right, let us move on. We will put it into a hyper care space, make sure that it actually is fixing itself and that the next two or three iterations of that event or environment is how we expected the outcome to be." (P14, male, head of supply chain Southern Africa)

Moreover, three participants mentioned that they typically choose to make smaller, incremental changes to their SCD readiness capabilities based on their SCD learnings because it is more affordable than making larger changes. This is evident in the quotation below:

> "Very large changes are typically quite expensive, so we do not always make very large changes. No, there will be smaller, incremental changes …" (P10, male, country manager).

Reliance on employees to remember and adapt was highlighted by three participants as another way to implement SCD learnings. OC fashion retailers may rely on employees to recall and incorporate prior SCD learnings in their decision making whilst responding to future SCDs, to realize improvements in its future SCD handling. The following quotation indicates this point:

> "It is through experience, so the things that it taught us … in those environments definitely will stand us in good stead … unless you actually do it, you do not understand every knock-on effect." (P6, male, head of supply chain).

External supply chain partner involvement was highlighted by four participants as another way to implement SCD learnings. Consulting with external supply chain partner before making any changes based on SCD learnings ensures that OC fashion retailers do not inadvertently cause disruption elsewhere in the supply chain. This is illustrated in the quotation below:

> "It is reviewed by all parties to make sure that we are not only changing our environment … because you could make one change here and disrupt five other streams. That is your worst mistake you could ever make ..." (P14, male, head of supply chain Southern Africa)

This study confirms three methods found in the literature on how organizations implement their SCD learnings to improve its SCD readiness. These include adapting BCPs, amending supply chain strategies and processes, making incremental SCD readiness changes, and external supply chain partner involvement (Azadegan *et al.* 2019; Behdani 2013; Scholten and Schilder, 2015; Scholten *et al*. 2019). In addition, this study expands on the literature by identifying two SCD learning implementation methods that is currently not evident in the literature, namely, the creation of new key performance indicators and reliance on employees to remember and adapt. This study also identified the prevention of blame culture as a factor behind why organizations refrain from engaging in SCD learning. Furthermore, this study contradicts Ali et al. (2017), stating that collaborative learning with external supply chain partners is integral to SCD learning, as the findings indicate that OC fashion retailers do not work with these partners whilst conducting their SCD learning techniques and instead merely communicate their learnings with them afterwards.

5. Conclusion

5.1. Summary of findings and implications

The aim of this study was to explore the nature of OC-related SCDs, the different SCD mitigation capabilities, and the various SCD recovery strategies present in the South African OC fashion retail industry. Furthermore, this study aimed to determine how South African OC fashion retailers employ new SCD knowledge to better prepare for future SCDs. The first research question addressed the nature of OC-related SCDs that South African OC retailers face. This study confirms multiple possible negative effects of utilizing an OC retailing strategy found in existing literature, including, conflict between channels, reputational damage, and stock pileups at brick-and-mortar stores (de Borba *et al*. 2020; Melacini *et al*. 2018; Mirzabeiki and Saghiri, 2020). Furthermore, this study expands on the literature by finding additional possible negative effects of an OC retailing strategy: negative financial implications and inaccurate inventory replenishment. This study adds to the literature by determining that the financial implications due to the rapid demand shift to online OC-related SCD is specific to the South African context due to organizations underutilizing online channels prior to the pandemic; and through identifying the OC-related endogenous SCDs that produce these negative effects as well as the different causes of these SCDs.

The second question addressed the SCD mitigation capabilities that South African OC fashion retailers possess. This study's finding corroborates those of Behdani (2013), stating that organizations may not prepare for SCDs as it is unrealistic to consider all the different types of potential SCDs. Furthermore, this study confirms the use of the SCD readiness policy, keeping strategic inventory reserves, available in the literature (Sawik, 2017). However, the other two common SCD readiness policies found in the literature, establishing an effective means of communication with supply chain partners and having back-up suppliers on standby, was not found in the South African OC fashion retail industry (Chen *et al*. 2019; Son and Orchard, 2013). This study also adds to the SCD literature by identifying in the OC context that retailers may respond to SCDs by prioritizing their online channel's order fulfilment.

The third research question addressed the different SCD recovery strategies that South African OC fashion retailers typically implement. This study's finding aligns with those of Scholten and Schilder (2015), stating that collaboration and communication with external supply chain partners is crucial to recovering from SCDs. In addition, expanding on the work of Larke, *et al*. (2018), who found that multiple touchpoints in OC retailers creates operational complexity, this study found that multiple touchpoints can also benefit SCD recovery through transferring order fulfilment between channels during a SCD.

The fourth research question addressed how South African OC fashion retailers utilize post-SCD knowledge to improve their SCD readiness. This study corroborates multiple SCD learning implementation methods, namely, adapting BCPs, amending supply chain strategies and processes, making incremental SCD readiness changes, and external supply chain partner involvement (Azadegan *et al.* 2019; Scholten and Schilder, 2015; Scholten *et al.* 2019). This study also adds to the literature by finding new SCD learning implementation methods: the creation of new key performance indicators and reliance on employees to remember and adapt. Furthermore, this study expands on the literature through identifying the prevention of blame culture as a reason for why organization's do not engage in SCD learning. Lastly, Ali et al. (2017) states that collaborative learning with external supply chain partners is integral to SCD learning. However, in contradiction, this study found that South African OC fashion retailers merely inform their external supply chain partners about the new SCD learnings.

5.2. Managerial recommendations

First, this study creates awareness about the existence of the different types of OC-related SCDs, and the specific correlating causes and effects of each OC-related SCD. Managers should, consequently, take steps to prevent these OC-related SCDs from occurring and develop specific mitigation capabilities to reduce the potential negative effects on their respective organizations' supply chains. These findings also inform management in retail organizations who are looking to adopt an OC strategy of the potential downsides to consider before committing to this decision. Second, the findings indicate the absence of establishing effective communication with external supply chain partners and having back-up suppliers on standby prior to SCDs in the South African OC retail industry. Managers, however, should stop overlooking these two fundamental SCD readiness policies as they can provide considerable benefits in the event of SCD, such as the timely and accurate sharing of critical SCD information, and continuity of supply. Last, the findings highlight that OC fashion retailers do not work with external supply chain partners during the SCD learning process. Therefore, managers should start including them as they may contribute value lessons learnt from their own SCD handling mistakes that will help managers avoid repeating those same mistakes unnecessarily.

5.3. Limitations and directions for future research

This study was conducted during the COVID-19 pandemic and may therefore be skewed towards COVID-19 events due to participants facing COVID-19 related supply chain challenges at the time of the interviews. Furthermore, this study was only conducted in the South African context and in large organizations, thus limiting the generalizability and transferability of the study's findings to other developing countries and smaller OC fashion retailers. Therefore, this study may be replicated in other developing countries or in smaller OC fashion retailers. Additionally, most of the participating organizations had only adopted an OC retailing strategy within the 6 years preceding the interviews and may therefore not have had sufficient time to ascertain the optimal OC-related resiliency measures. Therefore, researchers should validate the study's findings in the future once these organizations have had a greater opportunity to determine the best way to ensure supply chain resiliency from an OC perspective. This study also did not determine the severity of the different OC-related SCD effects on OC retailers. Therefore, a quantitative study is recommended to accurately assess the effects of OC-related SCDs on organizations to gain an understanding on which OC-related SCDs should be prioritized in the SCDM process. Lastly, a quantitative study is also suggested to accurately determine the nature of the relationships between the various OC-related SCD types, causes and effects.

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