



# The role of supply chain collaboration in disruption recovery: a logistics services perspective

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## ABSTRACT

**Purpose of the study:** Supply chains are faced with various disruptions which impact the performance of the focal firm and its network partners, such as third-party logistics providers (3PLs). Successful supply chain collaboration (SCC) can improve supply chain performance and provide greater synergistic advantages to network partners than could be achieved when working independently. SCC has been addressed extensively in the literature, but the specific role of SCC in supply chain disruption (SCD) recovery is unclear. This study aimed to explore how South African 3PLs and their clients collaborate during SCD recovery and the enablers of and barriers to such SCC.

**Design/methodology/approach:** This study employed a generic qualitative research design. Data were collected from ten 3PLs and ten client firms through semi-structured interviews with senior managers.

**Findings:** The study identified four distinct roles of SCC during disruption recovery: facilitating, contributing, interconnecting and retaining. Furthermore, 3PLs and clients identified communication, IT, risk mitigation, and



risk response tools and techniques for SCC during SCD recovery. In addition, the findings also reveal a range of intra- and inter-firm enablers and barriers to SCC during disruption recovery.

**Recommendations/value:** This study builds on the current literature by exploring SCC in SCD recovery within an emerging market setting, and SCC between 3PLs and their clients in an SCD recovery context.

**Managerial implications:** Having a deeper understanding of the role of SCC in SCD recovery, the tools and techniques for SCC in SCD recovery and what drives and prevents SCC in SCD recovery, practitioners can fully realise the benefits associated with successful SCC in SCD recovery.

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### Keywords

3PLs; Disruption recovery; Deneric qualitative research; South Africa; Supply chain collaboration

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**JEL Classification: L14**

## 1. INTRODUCTION

Supply chains have evolved from simple business models to complex and extended networks where firms are increasingly dependent on their network partners (Revilla & Sáenz, 2013; Sanchez Rodrigues *et al.*, 2015; Kamalahmadi & Parast, 2016). Consequently, this network interdependence makes supply chains more vulnerable to various risks and disruptions, as experienced during the recent Covid-19 pandemic (Zhu *et al.*, 2016; Liu & Lee, 2018; Wooderson, 2022). Supply chain disruptions (SCDs) can be understood as inadvertent and unforeseen occurrences which result in risks to the supply chain (Brüning *et al.*, 2015; Botes *et al.* 2017; Brüning & Bendul, 2017). In addition, SCDs may negatively affect a firm's operational and financial performance (Craighead *et al.*, 2007; Revilla & Sáenz, 2013). These negative consequences highlight the importance of managing SCDs (Blackhurst *et al.*, 2005; Macdonald & Corsi, 2013; Hohenstein, 2022).

Supply chain disruption management (SCDM) investigates the impact of SCDs throughout the overall supply chain and manages the entire lifecycle thereof (Porterfield *et al.*, 2012). The interdependence between supply chain partners signals the need for firms to engage in collaboration efforts during the disruption recovery phase (Basole & Bellamy, 2014). Supply chain collaboration (SCC) entails working with network partners to respond to SCDs, generating benefits greater than those individual firms could achieve (Ali *et al.*, 2017; Brüning & Bendul, 2017). As unpredictable events occur throughout the interconnected supply chain, SCC provides an opportunity to recover from a disruption. This requires bringing the firm's disrupted operations back to a normal state of functioning (Behdani, 2013). Various disruption management frameworks exist to achieve this recovery by either proactively or reactively

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managing disruptions (Blackhurst *et al.*, 2005; Macdonald & Corsi, 2013; DuHadway *et al.*, 2017).

Not all SCDs are predictable, as supply chains are inherently risky and prone to inevitable events that lead to disruptions (Hohenstein *et al.*, 2015; Tukamuhabwa *et al.*, 2017). Accordingly, a firm must be able to recover reactively by implementing a strategy to manage such events. Collaboration can be understood as a proactive and reactive strategy used to manage an SCD before or after it has occurred, thereby preventing or responding to it (Scholten *et al.*, 2014; Tukamuhabwa *et al.*, 2017). However, using SCC for reactive disruption recovery is a new concept and thus requires further exploration. In addition, it is also necessary to gain an understanding of the enablers and barriers to SCC in this unique context (Brüning & Bendul, 2017).

Enablers of collaboration are facilitators, which can lead to operational efficiencies and effectiveness within the supply chain (Richey *et al.*, 2010). These enablers to SCC include aligning goals and incentives, information sharing, trust and commitment (Brüning & Bendul, 2017; Gabler *et al.*, 2017). Other enablers include resource sharing, collaborative communication and decision synchronisation (Scholten & Schilder, 2015; Pradabwong *et al.*, 2017). Barriers refer to those factors which hinder and resist effective collaboration (Fawcett *et al.*, 2008). These factors include a lack of trust among network partners, a lack of information sharing, non-aligned goals and inter-functional conflict (Fawcett *et al.*, 2008; Ramesh *et al.*, 2010; Gabler *et al.*, 2017). SCC is vital in minimising the effect of SCDs between network partners, such as third-party logistics providers (3PLs) and their clients (Scholten & Schilder, 2015).

The Covid-19 pandemic highlighted the importance and relevance of 3PLs in supply chains (Choi, 2021). In emerging markets such as South Africa, 3PLs play significant roles as orchestrators to create value in the supply chain (Ittmann & King, 2010; Havenga *et al.*, 2016). As emerging markets are more vulnerable to SCDs than developed markets, SCDs do not only impact 3PLs but also their downstream clients, who may fail to meet customer needs (Niemann *et al.*, 2018). The Business Continuity Institute (2018) ranked the top five SCDs in sub-Saharan Africa as: unplanned IT or telecommunication outages, energy scarcity, loss of talent or skills, currency exchange rate volatility and transport network disruptions. South Africa, as an emerging market, experiences similar SCDs (Nel *et al.*, 2018).

This study addresses the need for further research on SCC for SCD recovery in an emerging market context (Huo *et al.*, 2017; Tukamuhabwa *et al.*, 2017). The literature mainly addresses the single perspective of the network partnership, but the importance of multiple perspectives

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should not be underestimated so that the perspectives of the focal firm and its clients are considered (Craighead *et al.*, 2007). There is a lack of understanding of how 3PLs and their clients collaborate during disruption recovery in an emerging market context. Further research is also required to identify and examine facilitators of SCC for SCD recovery (Li *et al.*, 2015). This could be achieved by assessing the enablers of and barriers to SCC during SCD recovery within a South African 3PL and client setting. This generic qualitative study aims to explore the role of SCC between 3PLs and their clients during SCD recovery within a South African context. It also determines how 3PLs and their clients collaborate during SCD recovery. Finally, this study addresses the enablers of and barriers to SCC between 3PLs and their clients during SCD recovery.

This study was guided by the following research questions:

1. What role does SCC between 3PLs and their clients play during SCD recovery?
2. How do 3PLs and their clients collaborate during SCD recovery?
3. What are the enablers of SCC between 3PLs and their clients during SCD recovery?
4. What are the barriers to SCC between 3PLs and their clients during SCD recovery?

This study contributes to the literature by exploring SCC in SCD recovery within an emerging market setting, and SCC between 3PLs and their clients in an SCD recovery context. Finally, enablers of and barriers to SCC within an SCD recovery context were identified.

## **2. LITERATURE REVIEW**

The literature review provides an overview of the South African Third-party logistics industry and introduces the key constructs of the study. These include supply chain disruption management, disruption recovery and supply chain collaboration.

### **2.1 Third-party logistics service providers in South Africa**

Logistics functions are viewed as one of the fundamental activities with a reduced need to be managed in-house, as they can be outsourced to capable supply chain partners, such as 3PLs (Tezuka, 2011; Alkhatib *et al.*, 2015). 3PLs are external suppliers moving and/or storing goods throughout the supply chain from the point of origin to the point of consumption on behalf of their clients (Coyle *et al.*, 2013; Grant *et al.*, 2014). Firms in South Africa are increasingly outsourcing their logistics functions to the extent that most logistical activities are predominantly performed by 3PLs (Waugh & Luke, 2011). South Africa's logistics industry could be viewed as a strategic resource for the economy and is also a primary facilitator for achieving a global competitive advantage (Ittmann & King, 2010; Havenga *et al.*, 2016). The

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volatile nature of the South African economy has placed enormous pressure on the logistics industry, whereby the country's logistics performance impacts its level of growth and integration (Ittmann, 2018). The South African logistics sector faces various disruptions, such as labour issues internal to the firm, border delays between firms and government regulations, and poor infrastructure external to the firm (Nel *et al.*, 2018). This illustrates the proneness of South Africa's logistics sector to SCDs, impacting South Africa's logistical performance and, ultimately, its level of growth and integration.

## 2.2 Supply chain disruption management

Supply chain risks include disruptions that negatively influence the flow of materials, information and finances, which, in turn, impacts the achievability of a firm's goals and that of the larger supply chain in terms of cost, quality and time (Spiegler *et al.*, 2012; Hofmann *et al.*, 2014). An SCD can thus be described as a realised supply chain risk (Habermann *et al.*, 2015). Various sources of SCDs have been identified, including natural disasters, socio-political issues, regulatory changes and financial issues (Revilla & Sáenz, 2014; Blos *et al.*, 2015). SCDs also have a ripple effect throughout the entire supply chain network, whereby their impact becomes greater as they move through the nodes (Świerczek, 2014; Habermann *et al.*, 2015).

Excessive mutual dependence among network partners causes the SCDs to amplify through the supply chain network (Świerczek, 2014). Therefore, it is critical that supply chains timely and effectively identify, react and respond to SCDs to reduce their negative consequences (Chang *et al.*, 2015). When firms are able to identify SCDs, they can select appropriate mitigation strategies that would result in more effective disruption management (Blackhurst *et al.*, 2005). Traditional risk management practices entail quantifying risks to reduce the probability of an SCD occurring, thereby taking a more proactive approach to managing SCDs (Simchi-Levi *et al.*, 2014; Scholten & Schilder, 2015; De Goede *et al.*, 2018). The unpredictable nature of risks calls for reactive risk management – also referred to as SCDM – which entails returning operations to a normal state of functioning (Macdonald & Corsi, 2013; Revilla & Sáenz, 2014).

### 2.2.1 Disruption management frameworks

The literature provides various frameworks incorporating disruption recovery (Blackhurst *et al.*, 2005; Macdonald & Corsi, 2013; DuHadway *et al.*, 2017). The first framework deals with three areas when responding to SCDs: disruption discovery, disruption recovery and supply chain redesign (Blackhurst *et al.*, 2005). These three areas depend on one another as the

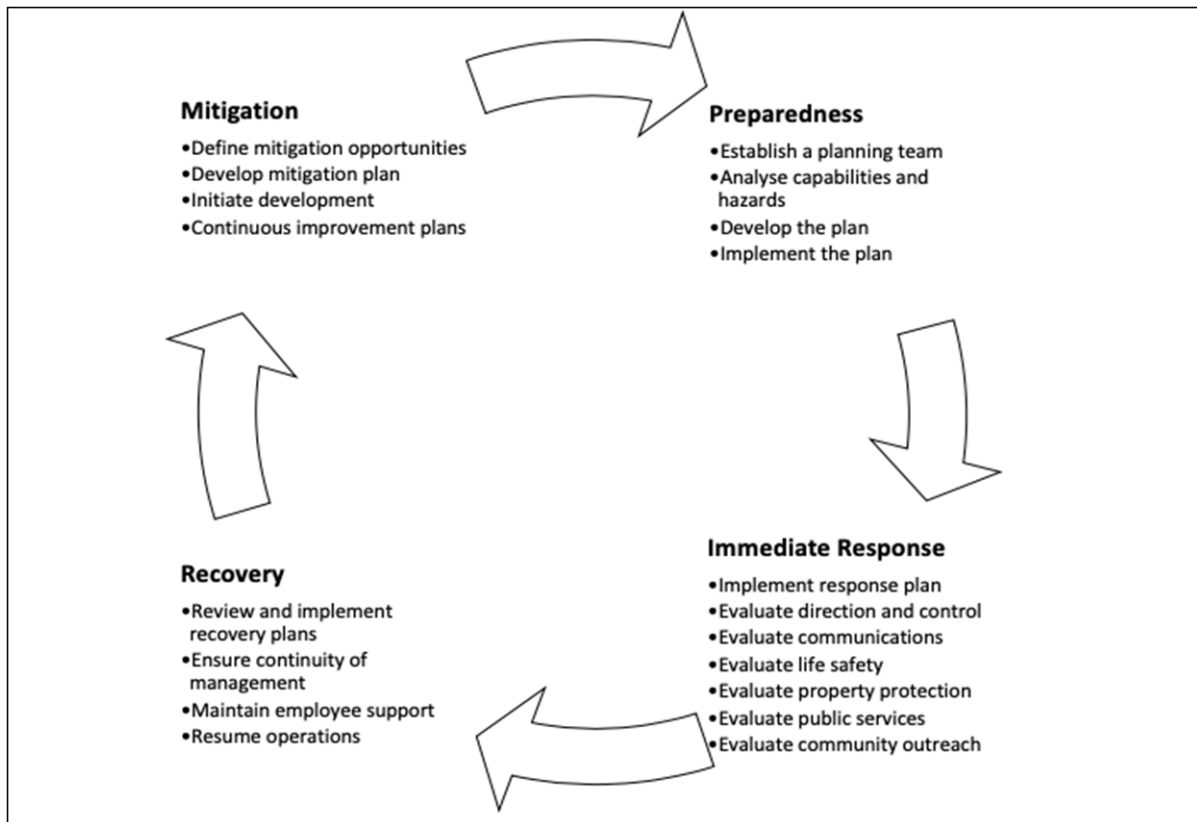
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preceding step will affect the succeeding step. The second framework builds on the first framework by including performance as part of the SCDM process (Macdonald & Corsi, 2013). According to this framework, the most important factor in managing a disruption is the time frame a firm uses to identify a disruption and return the firm to its original state (Tukamuhabwa *et al.*, 2015; Chen *et al.*, 2019). In addition, this framework has readiness as an element, where firms analyse previous plans as part of their risk management planning (Parajuli *et al.*, 2017; Chen *et al.*, 2019). The third disruption management framework includes disruption detection, mitigation and recovery (DuHadway *et al.*, 2017). This framework builds on the first and second frameworks by including risk mitigation as part of the SCDM process, which entails reducing the adverse effects of an SCD as it occurs.

### **2.2.2 Disruption management process**

A disruption management process suggested by Scholten *et al.* (2014) consists of the following stages: mitigation, preparedness, immediate response and recovery, as depicted in Figure 1. Mitigation and preparedness use horizontal and vertical collaboration, whereby the horizontal and vertical collaboration capabilities must be established among network partners and then converted into operational plans, respectively. These stages demonstrate the use of collaboration as a proactive strategy for SCDM. Furthermore, horizontal and vertical collaboration forms part of the immediate response and recovery stage, thus also being a reactive collaboration. This is where the disaster plan and pre-established recovery plans are implemented when a disruption occurs (Scholten *et al.*, 2014).

Figure 1: Disruption management process



Source: Adapted from Scholten *et al.* (2014)

The commonalities of the previously mentioned frameworks are that they all incorporate a pre-disruption, during-disruption and post-disruption phase when managing SCDs. The pre-disruption phase includes risk detection, preparedness and risk discovery. The during-disruption phase includes risk mitigation, recovery and readiness. And the post-disruption phase includes redesign and performance. Therefore, assessing how firms work together during these SCDM stages is important (Scholten *et al.*, 2014). However, this study only focuses on disruption recovery.

### 2.3 Supply chain disruption recovery

SCD recovery aims to recover from an SCD as quickly as possible to reduce its impact. Accordingly, firms endeavour to recover to avoid financial losses and satisfy end-customer demand (Blackhurst *et al.*, 2005; Macdonald & Corsi, 2013). SCD recovery forms part of supply chain resilience (Hohenstein *et al.*, 2015; Adobor & McMullen, 2018), which can be defined as a firm's ability to bounce back from an SCD and restore its operations to a normal state (Day, 2014; Ambulkar *et al.*, 2015). Hohenstein *et al.* (2015) identified four elements of supply chain resilience: readiness, response, recovery and growth. The recovery element

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focuses on quickly returning operations to a normal state of functioning to remain competitive (Hatton, 2015). SCC for recovery is essential in response to an SCD to reduce its negative impact (Zhu *et al.*, 2016). Therefore, SCC is critical to SCDM, as it facilitates an effective SCD recovery (Lavastre *et al.*, 2014; Li *et al.*, 2015; De Goede *et al.*, 2018). SCC can be used to help manage rare but high-impact SCDs to improve performance and bring about further benefits after an SCD, such as a more responsive supply chain enhancing customer value and SCD recovery. SCC also assists network partners in minimising SCD damage and recovery costs while customer value is improved (Zhu *et al.*, 2016; Zhu *et al.*, 2017).

## 2.4 Tools and techniques used for supply chain collaboration

SCC can be categorised into intra-firm collaboration, which takes place within a firm, and inter-firm collaboration, which occurs externally among several firms (Kache & Seuring, 2014). The two main types of collaboration are horizontal and vertical, which take place at the inter-firm level. Horizontal collaboration occurs when firms that are unrelated or competing (at the same level in the supply chain) work together to share resources and valuable information. Vertical collaboration occurs between a supplier and a client firm (at different levels in the supply chain), such as a manufacturer and a distributor who may share resources and information to satisfy end-customer needs (Soosay *et al.*, 2008; Sanchez Rodrigues *et al.*, 2015; Botes *et al.*, 2017).

Collaborative tools and techniques within the supply chain are mainly used to facilitate information sharing (Panahifar *et al.*, 2018). As a result, firms require basic IT infrastructure to enable effective communication and inter-firm application systems (Wu *et al.*, 2014). Inter-firm application systems allow for the transmission of firm transactions and documents in a computer-to-computer manner through, for example, electronic data interchange (EDI) (Qu & Yang, 2015). EDI can be viewed as a tool to enable collaboration and foster relationship-building between network partners (Ahmad & Ullah, 2013). Collaborative planning forecasting and replenishment (CPFR) can be understood as a process for collaborating on forecasting and planning initiatives throughout the supply chain (Ahmad & Ullah, 2013). CPFR benefits include improved customer service levels and the strengthening of relationships between network partners (Panahifar *et al.*, 2018). Another collaborative tool is enterprise resource planning (ERP) systems, used to integrate the functional divisions within a firm and support internal collaboration (Mahadevan, 2015). The supply chain operations reference model has also been viewed as a collaborative tool to enhance supply chain processes (Mahadevan, 2015). An overreliance on IT without network partners' willingness to share information could lead to a lack of effective SCC (Wu *et al.*, 2014).



## 2.5 Enablers of supply chain collaboration

Resource sharing as an enabler of SCC is the process of using and investing in the capabilities and assets of network partners (Cao & Zhang, 2011). It results in various benefits such as creating synergies among network partners enabled through SCC, facilitating joint planning and supporting real-time information exchange (Lehoux *et al.*, 2014; Li *et al.*, 2015; Scholten & Schilder, 2015).

Information sharing is the degree to which a network partner can communicate important information with others. Effective and accurate information sharing can be enhanced through information and collaborative communication technologies. When network partners share information, it enables supply chain visibility and facilitates preparedness for SCDs (Cao & Zhang, 2011; Scholten *et al.*, 2014; Soni *et al.*, 2015; Panahifar *et al.*, 2018).

Joint knowledge creation as an enabler of SCC is the degree to which network partners build a stronger comprehension of their competitive environment through working and learning together (Scholten & Schilder, 2015). When individual firms engage in SCC and share knowledge, the benefits achieved are greater than what would be achieved in an arms-length relationship (Hudnurkar *et al.*, 2014).

Decision synchronisation is the degree to which network partners coordinate and execute decisions (Simatupang & Sridharan, 2005). It is required to effectively respond to SCDs, whereby using SCC is critical to improve responsiveness and mitigate SCD impacts (Scholten & Schilder, 2015). When incentives are aligned, collaborating partners are more likely to work towards mutually beneficial objectives (Hudnurkar *et al.*, 2014; Pradabwong *et al.*, 2017). To achieve goal alignment, network partners require mutually agreed-upon result-focused metrics (Cao & Zhang, 2011; Pradabwong *et al.*, 2017).

Trust as an enabler of SCC refers to the level at which network partners believe one another to be benevolent and credible (Ahmad & Ullah, 2013). It can moderate the level of collaboration across the supply chain, impacting both the width and depth of collaborative efforts (Panahifar *et al.*, 2018). Trust increases the inclination to further contribute to relationship-specific investments, which impel commitment to future activities (Brinkhoff *et al.*, 2015; Panahifar *et al.*, 2018). Commitment occurs when one partner perceives a network relationship to be valuable, warranting effort to ensure it perpetuates (Brüning & Bendul, 2017).

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## 2.6 Barriers to supply chain collaboration

Barriers to successful SCC can prohibit the sharing of resources between customer and client firms within a network, which reduces the potential achievement of competitive advantage (Fawcett *et al.*, 2012). Information sharing is a prerequisite for prosperous inter-firm relationships and impedes successful SCC efforts when inadequate. This may be due to one-way communication in network relationships, which causes partner firms to not share further information if their efforts are not reciprocated. Significant differences in the network partner's technological capability may also hinder smooth information exchange (Fawcett *et al.*, 2008; Richey *et al.*, 2009; Ramesh *et al.*, 2010; Fawcett *et al.*, 2012; Gabler *et al.*, 2017).

Inconsistent and inadequate measurement systems can lead to insufficient performance metrics, which hinder SCC as partners focus on enhancing their own local performance and goals rather than that of the entire supply chain (Ramesh *et al.*, 2010; Fawcett *et al.*, 2012; Gabler *et al.*, 2017). Low levels of trust among firms prevent the sharing of valuable information and resources that facilitate SCC (Ramesh *et al.*, 2010; Ramanathan, 2014; Soosay & Hyland, 2015). Honesty and openness are requirements for trust; therefore, SCC would not be successful if these factors were lacking (Barrat, 2004). SCC also needs senior management's commitment and support to function. Firms lacking top management commitment cannot engage in major collaboration efforts (Fawcett *et al.*, 2012).

Internalisation refers to how a firm's values, attitudes or regulations are internalised and how external partners are no longer considered to hamper SCC efforts (Gabler *et al.*, 2017). Firms may focus on their own operations rather than those of their external network, neglecting the importance of partnerships (Richey *et al.*, 2010; Gabler *et al.*, 2017). A lack of supply chain vision can lead to a functionally focused firm where the management's visibility of their supply chain is restricted. This can be understood as the silo mentality, which is a barrier to SCC (Ramesh *et al.*, 2010; Soosay & Hyland, 2015).

Unidirectional communication among firms within a network signifies an unwillingness to share information. Firms manifest a command-and-control orientation to limit the possibility of losing important information; however, this can negatively impact SCC and firm performance (Richey *et al.*, 2010; Gabler *et al.*, 2017). Poor relationships prevent network partners from sharing valuable information, putting a strain on the relationship and creating power struggles. This prevents effective SCC as mistrust and suspicion fester between network partners (Gumboh & Gichira, 2015).

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A lack of technological capability in terms of incompatible IT infrastructure between network partners can impede effective SCC (Ramesh *et al.*, 2010; Cai *et al.*, 2016). Lacking IT capability reduces effective communication between network partners (Ramesh *et al.*, 2010). Additionally, a lack of adequate staff training in terms of skills related to leadership and relationship-building can also hinder SCC (Gumboh & Gichira, 2015). Differences in knowledge across firms can prevent integration between network partners, hindering effective SCC (Gumboh & Gichira, 2015).

### **3. METHODOLOGY**

This section presents an in-depth discussion of the methodological decisions applied in this study.

#### **3.1 Research design**

This study followed a generic qualitative research design, allowing the researchers to explore the participants' opinions, experiences and attitudes (Percy *et al.*, 2015). As this study attempted to obtain a deeper understanding of SCC in SCD recovery from a 3PL and client perspective, this research design is appropriate, allowing the researchers to build on prior knowledge of this topic.

#### **3.2 Sampling**

The study's units of analysis were 3PLs and their clients in South Africa, and the units of observation were the managers employed by these firms. Ten 3PLs and ten client firms participated, allowing for 20 semi-structured interviews. Homogenous sampling, a form of purposive sampling, was used to select the 3PL firms and individual participants with similar characteristics (Creswell, 2012). Social media platforms such as LinkedIn were used to identify possible 3PLs firms and participants. The sampled 3PL firms all had the following characteristics: firstly, they have to operate in the logistics service industry; secondly, as the context of this study is in South Africa, the 3PLs must operate in South Africa; and thirdly, the 3PLs should have experienced a recent SCD. In addition, the sampled 3PL participants all had the following characteristics: firstly, the individuals must be at a middle to senior managerial level; secondly, the participants should have a minimum of 12 months' work experience at the specific firm; and thirdly, the participants should have been involved in an SCD that impacted the respective firm.

The 3PLs were selected and sampled using the inclusion criteria, and thereafter, the clients were sampled using snowball sampling. Snowball sampling is the process of requesting referrals from participants (3PLs) who can recommend other participants (clients) who form

part of the inclusion criteria (Oppong, 2013; Robinson, 2014; Woodley & Lockard, 2016). The sampled client firms had to comply with the following inclusion criteria: firstly, the client firms should use the services of a 3PL; secondly, the client firms must operate in South Africa; and thirdly, the client firms should have experienced an SCD. Table 1 provides a profile of the participants.

**Table 1: Participant profiles**

Participant	Job Title	Industry	Duration
P1	Managing director	3PL	38:45
P2	Group projects and optimisation manager	3PL	28:03
P3	Regional manager (Inland)	3PL	29:28
P4	Import operations manager	3PL	21:29
P5	Managing director	3PL	33:37
P6	Supply chain optimisation executive	3PL	39:27
P7	General manager	3PL	27:39
P8	Transport manager	3PL	15:18
P9	Senior account director	3PL	38:25
P10	Business development manager	3PL	31:31
P11	Export operations manager	Paint and Chemical Manufacturing Industry	17:17
P12	Supply chain manager	Mining Industry	49:18
P13	Senior supply chain manager (outbound)	Automotive Industry	44:36
P14	Managing director	Agricultural Manufacturing Industry	15:59
P15	Procurement manager	Chemical Manufacturing Industry	29:01
P16	Logistics manager	Chemical Manufacturing Industry	28:55
P17	Owner	Steel Merchant Industry	11:44
P18	Managing director	Firefighting, Pumps and Accessories Industry	20:42
P19	Head of supply chain Africa and Brazil	Fashion Industry	21:33

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Participant	Job Title	Industry	Duration
P20	Fashion, beauty and home transport operations manager	Fast-moving Consumer Goods Industry	10:19

Source: Compiled by the authors

The final sample size was based on the principle of data saturation (Guest *et al.*, 2006). The study included 20 participants: ten representing 3PL firms and the other ten representing 3PL clients. In this study, all the codes were identified after the sixteenth interview had been conducted and the main themes had been identified. An additional four interviews were conducted without any new significant data being presented.

### 3.3 Data collection

Data for this study was collected through 20 face-to-face, semi-structured interviews. This data collection method ensures flexibility by diverging from the main questions to explore an idea in more detail (Rowley, 2012; Malterud *et al.*, 2016). The interviews were audio recorded and transcribed verbatim. A discussion guide (Appendix A) was formulated based on the study's research questions and literature review. The interview questions were open-ended to avoid leading the participants and accompanied by probes to encourage participants to elaborate on their responses (Cachia & Millward, 2011; Creswell, 2012). Two pre-tests were conducted with an experienced 3PL practitioner and one of their clients to obtain feedback. These interviews were included in the sample as only minor amendments were made to the discussion guide. The semi-structured interviews lasted between 15 and 50 minutes, with an average duration of 27:45 minutes. Prior to each interview, permission to audio record the proceedings was given, and the participants signed the informed consent form reassuring them of their anonymity.

### 3.4 Data analysis

Thematic analysis was used to analyse the data, whereby codes were identified through deductive and inductive approaches. Similar codes were then grouped to create underlying themes and sub-themes (Braun & Clarke, 2012). ATLAS.ti version 8 was used to code and group the collected data. Atlas.ti is specifically developed to generate and manage codes and identify the relationship between codes and themes. The transcriptions were coded by assigning labels to data segments relevant to the research questions. Similar codes were merged to eliminate redundancy, and these codes were then grouped into main themes and sub-themes to illustrate the connection between the data and research questions.

### **3.5 Trustworthiness**

To demonstrate this study's trustworthiness, the researchers used the following trustworthiness criteria: credibility, dependability, transferability and confirmability (Polit & Beck, 2012). Credibility was ensured by using participant validation, which was achieved on an ongoing basis by diligently probing to obtain clarification on participants' responses (Shenton, 2004). Dependability was confirmed by using peer debriefing, which consisted of reviews of all changes and progress made throughout this research process (Lietz & Zayas, 2010). This study included a detailed description of its context to ensure transferability. This description included the number and industry of the firms, participants, the data collection methods used, and the number and length of the semi-structured interviews conducted (Shenton, 2004). Confirmability was ensured by meticulously transcribing the data collected (Milne & Oberle, 2005). The researchers also actively engaged in the coding and analysis process by constantly reviewing each code, theme and sub-theme until a consensus was reached.

### **3.6 Ethical considerations**

This study obtained ethical clearance from the relevant Research Ethics Committee at the University of Pretoria. All participants were required to sign the informed consent form prior to starting the interview. Upon the participants' recruitment, the researchers emphasised the extent of anonymity and confidentiality followed throughout this study, as a pseudonym was assigned to each firm and participant. The researchers also reassured the participants that they could withdraw at any time without any negative consequences.

## **4. FINDINGS**

This section outlines the study's findings in terms of the four main themes: the role of SCC in SCD recovery, the tools and techniques for collaboration in SCD recovery, the enablers of SCC during SCD recovery, and the barriers to SCC during SCD recovery. The findings are supported by raw data extracts. Table 2 summarises the main themes and sub-themes identified in this study.

Table 2: A summary of the main themes and sub-themes identified in this study

Theme	The role of SCC in SCD recovery	Tools and techniques for collaboration in SCD recovery	Enablers of SCC during SCD recovery	Barriers to SCC during SCD recovery
Sub-theme	<p><b>Facilitating role</b></p> <ul style="list-style-type: none"> <li>Enables SCD recovery</li> </ul> <p><b>Contributing role</b></p> <ul style="list-style-type: none"> <li>Enhances SCD recovery</li> </ul> <p><b>Interconnecting role</b></p> <ul style="list-style-type: none"> <li>Link between network partners</li> </ul> <p><b>Retaining role</b></p> <ul style="list-style-type: none"> <li>Client/partner retention</li> </ul>	<p><b>Communication tools</b></p> <ul style="list-style-type: none"> <li>Traditional communication tools</li> <li>Social media</li> <li>N3 Toll</li> <li>Concession website</li> </ul> <p><b>IT tools</b></p> <ul style="list-style-type: none"> <li>Standard IT solutions</li> <li>Applications</li> </ul> <p><b>Risk mitigation tools</b></p> <ul style="list-style-type: none"> <li>Standard operating procedures</li> <li>Win-loss analysis</li> <li>Risk management schedule</li> <li>Risk bow ties</li> <li>Risk register</li> <li>Insurance</li> <li>Training</li> </ul> <p><b>Risk response tools</b></p> <ul style="list-style-type: none"> <li>Root-cause analysis</li> <li>Incident management team</li> <li>Disaster recovery plan</li> <li>ICU lists</li> <li>Investigation</li> <li>Risk management protocols</li> </ul>	<p><b>Intra-firm enablers</b></p> <ul style="list-style-type: none"> <li>Aligned functional values</li> <li>Client retention</li> <li>Corporate culture</li> <li>Competent management styles</li> <li>Minimising loss</li> </ul> <p><b>Inter-firm enablers</b></p> <ul style="list-style-type: none"> <li>Trust and commitment</li> <li>Information sharing</li> <li>Business acumen</li> <li>Positive attitude</li> <li>Accountability</li> <li>Strategic relationships</li> <li>Communication</li> <li>Transparency/honesty</li> <li>Maturity</li> <li>Shared objectives</li> <li>Capability</li> </ul>	<p><b>Intra-firm barriers</b></p> <ul style="list-style-type: none"> <li>Poor management style</li> <li>Lack of capability</li> <li>Inter-functional conflict</li> </ul> <p><b>Inter-firm barriers</b></p> <ul style="list-style-type: none"> <li>Lack of trust/commitment</li> <li>Lack of information sharing</li> <li>Lack of business acumen</li> <li>Poor attitude</li> <li>Poor relationships</li> <li>Lack of communication</li> <li>Lack of transparency/honesty</li> </ul>

Source: Compiled by the authors

#### 4.1 Theme 1: The role of SCC in SCD recovery

The first theme to be addressed refers to the role that SCC plays in SCD recovery. The study identified four distinct roles of SCC during SCD recovery: facilitating role, contributing role, interconnecting role and retaining role.

##### 4.1.1 Facilitating role of SCC

Four participants mentioned that SCC plays a facilitating role during SCD recovery. The facilitating role refers to how SCC enables SCD recovery such that without SCC efforts

between network partners, SCD recovery would not be possible, and neither partner would be able to recover successfully. A prerequisite of SCC is having a strategic relationship with network partners, which brings about their commitment to work together to recover. Without such a strategic relationship, SCC would not occur, hindering successful SCD recovery and ultimately the ability to serve the end customer. This is illustrated by the following quotations:

*“Well, I mean, you need it. I mean, you can't; if you don't, and you stuck, you know, with something, you can't just carry on. You need to work together. Um, and you need to keep... you need to keep clients calm at the end of the day because they're spending a hell of a lot of money...” (P4, male, import operations manager)*

*“Um, we actually don't see our 3PL as a 3PL. We actually see them as a strategic partner because they play such a vital role in our business; without them, it's tough.” (P20, female, transport operations manager)*

Ali *et al.* (2017) and Brüning and Bendul (2017) state that SCC refers to working with network partners to respond to SCDs. This study's findings support the literature stating that SCC does play a facilitating role in SCD recovery.

#### **4.1.2 Contributing role of SCC**

Five participants indicated that SCC plays a contributing role in SCD recovery. The contributing role refers to how SCC enhances SCD recovery and creates synergies between network partners. These synergies may include shared experiences and resources. SCC allows for the pooling of resources from network partners for a more efficient and responsive SCD recovery, as shown in the following quotations:

*“Um, it's going to enhance it because, like I said, if you have a good relationship, your turnaround time is going to be quicker for your recovery.” (P20, female, transport operation manager)*

*“So, they have a bigger pool of... of expertise as well and experience. So, everyone pulls all that together, you know, then it's you.” (P13, male, senior supply chain manager)*

*“Cause, you can't do it on your own. Certainly not.” (P13, male, senior supply chain manager)*

According to Ali *et al.* (2017) and Brüning and Bendul (2017), SCC could generate benefits greater than individual firms could. This study's findings support the existing literature stating that SCC plays a contributing role in SCD recovery.



### **4.1.3 Interconnecting role of SCC**

Five participants indicated that SCC plays an interconnecting role between network partners in SCD recovery. SCC links network partners in SCD recovery, as firms within a network are interdependent. As a result, when an SCD occurs, all firms within a network are impacted; therefore, firms need to engage in SCC for successful SCD recovery, as indicated by the following quotation:

*"I believe they... they kind of understand that he is a problem. It doesn't just affect us; it affects the people all the way down." (P17, male, owner)*

SCDs impact all network partners in the supply chain due to network interdependence, demonstrating the need for SCC in SCD recovery (Porterfield *et al.*, 2012; Basole & Bellamy, 2014). This study's findings support the literature stating that SCC plays an interconnecting role between network partners in SCD recovery.

### **4.1.4 Retaining role of SCC**

Three participants indicated that SCC plays a retaining role during SCD recovery. SCC is used to help retain relationships with network partners, such as clients or suppliers, to ensure business continuity after an SCD has occurred. Client retention can be facilitated by increased information sharing during SCD recovery, ensuring business continuity, as illustrated by the following quotations:

*"To keep the business these days in South Africa, if you're not the ... and the other big service providers, nothing is contractual." (P3, male, regional manager)*

*"Well, ja, of course, it is... ah, the more they know, the better. Um, you do not want to keep your clients in the dark. They the ones that's actually paying your salary." (P8, male, transport manager)*

The retaining role that SCC plays during SCD recovery is not evident in the literature; thus, this study's findings add to the existing literature. Additionally, the literature does not specifically classify any of the abovementioned roles of SCC in an SCD recovery context.

## **4.2 Theme 2: Tools and techniques for collaboration in SCD recovery**

The second theme refers to how 3PLs and their clients collaborate in SCD recovery by using specific tools and techniques. The findings indicate four main categories: communication tools, IT tools, risk mitigation tools and risk response tools.

#### **4.2.1 Communication tools**

Seventeen participants mentioned the use of communication tools for SCC in SCD recovery. Communication tools include traditional communication tools such as email, telephone and letters, social media such as WhatsApp and the N3 Toll Concession website, which are used to collaborate in SCD recovery, as illustrated by the following quotations:

*“Just phoning, making sure that we get the message through to the right people.”  
(P20, female, transport operations manager)*

*“Emails and telecoms are preferred.” (P5, male, managing director)*

*“...social media for us, you know. We have a lot of WhatsApp groups on different teams.” (P13, male, senior supply chain manager)*

#### **4.2.2 IT tools**

Twelve participants mentioned the use of these tools to collaborate in SCD recovery. IT tools differ from communication tools, as they are embedded within the firm's infrastructure and include standard IT solutions and applications, as illustrated by the following quotations:

*“So, I mean, we've got the normal stuff that we use in the business, our ERP and all of that allows us to have certain visibility...” (P6, male, supply chain optimisation executive)*

*“...have this app available where you can actually record damages on your phone or the smart device.” (P2, male, optimisation manager)*

#### **4.2.3 Risk mitigation tools**

Eight participants mentioned the use of proactive mitigation tools. Such tools and techniques are used to proactively collaborate in SCD recovery and include standard operating procedures, win-loss analysis, risk management schedule, risk bow ties, risk register, insurance and training. When an SCD occurs, SCC between network partners takes place, as illustrated by the quotations:

*“So, there would be procedures and policies based on the risk register. So, the risk register would say something is green, amber or... or red. And it would say if... if you've mitigated it, and there's residual risk, how do you actually handle that. And then it will tell you if, for instance, let me think now, community unrest: somebody burns the trucks of the third party; what do you do?” (P12, female, supply chain manager)*

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*“Well, I mean we've got, um, standard operating procedures in place where, you know, if a stop happens, you know, our staff know this is what you need to do. This is where you [know who] to contact first, who to put a notice.” (P4, male, import operations manager)*

*“We do very in-depth risk management; we do risk bow ties.” (P12, female, supply chain manager)*

#### **4.2.4 Risk response tools**

The following risk response tools and techniques are used to respond by collaborating after SCDs have occurred. These reactive tools include root-cause analysis, incident management teams, disaster recovery plans, ICU lists, investigations and risk management protocols. Five participants indicated the use of such reactive tools to collaborate in SCD recovery, as illustrated by the following quotations:

*“We immediately, uh, put together an IMT. So it's an incident management team because it is... it's millions of dollars. So you have to just have a handle on it.” (P12, female, supply chain manager)*

*“So, we've got a disaster recovery programme, which is in terms of an accident or a high jacking.” (P3, male, regional manager)*

*“Not really; we'll just carry on with the protocols that we have in place.” (P10, male, business development manager)*

*“When an event occurs, whether it's an accident or our performance has dropped completely, we... we use something that they call the ICU list.” (P3, male, regional manager)*

The existing literature mentions the use of generic IT tools used in SCC, such as EDI, ERP and CPFR (Ahmad & Ullah, 2013; Wu *et al.*, 2014; Mahadevan, 2015; Qu & Yang, 2015). This study's findings are consistent with the generic IT tools found in the literature. However, additional SCC tools unique to SCD recovery were also identified, including social media, applications, incident management teams and ICU lists.

### **4.3 Theme 3: Enablers of SCC during SCD recovery**

The study identified 16 enablers of SCC, which were classified as intra-firm or inter-firm. Intra-firm enablers exist within a firm and its functions, whereas inter-firm enablers exist between firms, such as 3PLs and their clients. These enablers drive SCC in managing and recovering from SCDs.

### 4.3.1 *Intra-firm enablers*

A participant mentioned aligned functional values as valuable in driving SCC during SCD recovery to overcome the silo mentality. Misaligned functional values often prevent SCC efforts internally as different functions work towards their own goals instead of serving the end customer, as seen below:

*“You have to create functional values.... What do they believe is most important for a customer? So, it's all about collaboration.” (P1, male, managing director)*

The most prevalent intra-firm enabler is client retention, with 11 participants indicating that it drives their SCC efforts. Due to the competitive nature of the 3PL industry, SCC during SCD recovery is vital to maintain service levels and ultimately retain clients, as demonstrated by the following quote:

*“So, the client service is definitely one of the things that [have] to drive at collaboration afterwards. Um, I mean, if you didn't collaborate, for example, with a client and you get this issue again, and you have exactly the same result; naturally, the client wouldn't be happy...” (P2, male, optimisation manager)*

Two participants indicated the importance of having a good corporate culture as a way to build internal collaborative efforts and gain employee buy-in to drive SCC during SCD recovery. This is illustrated by the following quotation:

*“So, ja, it's definitely got to do with culture.” (P1, male, managing director)*

Two participants indicated that a competent management style motivates a can-do environment, enabling successful SCC during SCD recovery, as demonstrated below:

*“But if [we're] sitting with a nice democratic kind of, not too relaxed but relaxed, uh, forgiving kind of management style, understanding and able management style, and it's a lot more likely to be successful.” (P5, male, managing director)*

Finally, a single participant identified minimising loss as a driving factor to SCC during SCD recovery. As SCD recovery is resource-intensive, the longer it continues, the greater the loss, as indicated below:

*“...you have to get back on track as soon as possible. So, what you're trying to do is to minimise your loss.” (P12, female, supply chain manager)*

### 4.3.2 *Inter-firm enablers*

Nine participants identified trust and commitment as drivers of SCC in SCD recovery, as trust and commitment reduce the need for micro-managing network partners during SCD recovery, facilitating seamless collaborative efforts, as seen in the following quotation:

*"...we have burned our hand a few times in the past, but trust and commitment [are] there for sure..." (P8, male, transport manager)*

Three participants indicated information sharing as essential to SCC during SCD recovery because having information during SCDs enhances recovery through improved supply chain visibility, as illustrated below:

*"...you would recover better if you had better information, for example, and more visibility in the forward-going..." (P2, male, optimisation manager)*

Business acumen was identified by four participants as an enabler of SCC during SCD recovery because it reduces uncertainty during SCD recovery, as illustrated by the following quotation:

*"...just having some knowledge about when it's going to get sorted out helps out a lot..." (P17, male, owner)*

Having a positive attitude was indicated as an enabler of SCC by one of the participants since it increases network partners' willingness to engage in SCC during SCD recovery, as indicated below:

*"Attitude: attitude of the customer, attitude of us and attitude of our staff during the course of the disruption." (P5, male, managing director)*

One participant mentioned accountability as a driver of SCC during SCD recovery, as it reduces "pointing fingers", facilitating SCC efforts during SCD recovery, as shown below:

*"The moment you accept, umm, the fact that it was my mistake, and you tell the customer..." (P1, male, managing director)*

Strategic relationships were identified by 12 participants as a fundamental enabler of SCC during SCD recovery, as having a good working relationship is a prerequisite for effective SCC, as illustrated below:

*"This first thing is relationships. If there's no relationship, there's no collaboration." (P10, male, business development manager)*

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Eleven participants indicated communication as a key enabler of SCC during SCD recovery because it serves as a link between network partners, thereby facilitating SCC, as indicated below:

*“So, if there's a disruption, everything has to be on paper; everything has to be formally communicated; everyone has to talk to each other. And the only objective is to get the job back on track.” (P12, female, supply chain manager)*

Transparency and honesty were identified as enablers of SCC during SCD recovery by all participants since they increase openness and willingness to share information, which facilitates SCC, as shown below:

*“So, be honest and open about what you can deliver and, hopefully, during this time, you've actually shown that what you said actually happened.” (P6, male, supply chain optimisation executive)*

One participant indicated that maturity drives SCC during SCD recovery, as maturity leads to greater experience, which provides the necessary knowledge to collaborate more effectively to recover from an SCD, as indicated below:

*“And maturity of the business. The other one is maturity of the business and the customer.” (P5, male, managing director)*

Three participants mentioned that having shared objectives enables effective SCC during SCD recovery since working towards a common goal reduces the silo mentality, thus increasing the willingness to partake in SCC during SCD recovery, as shown below:

*“...if you don't have a shared objective, every guy looks after himself.” (P12, female, supply chain manager)*

Finally, four participants mentioned capability in terms of infrastructure, business skills, capital and flexibility as a driver of SCC during SCD recovery; thus, having these capabilities present would facilitate effective SCC, as illustrated in the following quotation:

*“...the people helping you to recover after a disruption, obviously, [are] highly specialised, and they've got a technical ability that helps you to recover.” (P12, female, supply chain manager)*

*“...business skills, technical skills, trust; you got to have money as well.” (P12, female, supply chain manager)*

The existing literature supports the following enablers of SCC: information sharing, communication, business acumen, shared objectives, trust, transparency, long-term relationships, corporate culture, honesty and commitment (Barrat, 2004; Cao & Zang, 2011, 2013; Hudnurkar *et al.*, 2014; Scholten & Schindler, 2015; Soosay & Hyland, 2015; Brüning & Bendul, 2017). This study found these enablers present within an SCD recovery context. In addition, the following additional SCC enablers unique to SCD recovery were also identified: Client retention, competent management style, capability, minimising loss, positive attitude, accountability and maturity.

#### 4.4 Theme 4: Barriers to SCC during SCD recovery

The study identified 12 barriers to SCC during SCD recovery, classified as intra-firm or inter-firm. Intra-firm barriers exist within a firm and its functions, whereas inter-firm barriers occur between firms such as 3PLs and their clients. These barriers hinder SCC in managing and recovering from SCDs.

##### 4.4.1 Intra-firm barriers

Four participants identified poor management style as an obstacle to SCC during SCD recovery, as stringent policies and autocratic management styles hinder internal collaborative efforts, thus complicating overall SCC, as indicated below:

*"...management style of the business and goes back to the previous one as well: the management style of the customer. If it's very autocratic and, uh, and demanding and, um, punitive, then you're going to battle..." (P5, male, managing director)*

Five participants identified a lack of capability as a barrier to SCC during SCD recovery since lacking the necessary infrastructure, staff skills and resources would prevent effective SCC, as illustrated below:

*"You've got to have solid people. Um, and you've got to have solid staff. Because you do... if you don't have solid staff, you don't achieve a lot." (P15, male, procurement manager)*

*"Lack of funding is a big one as well." (P12, female, supply chain manager)*

One participant mentioned inter-functional conflict as an obstacle to SCC during SCD recovery. This is because it leads to a lack of interaction between functions, thus hindering internal collaborative efforts and, by extension, SCC, as illustrated in the following quotation:

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*"...so, the moment you don't achieve those functional values in our case, that's when things go wrong, and that's, at that moment, you lose that interaction and that trust." (P1, male, managing director)*

#### **4.4.2 Inter-firm barriers**

Six participants indicated that a lack of trust/commitment serves as a barrier to SCC during SCD recovery because if trust is missing between network partners, they would be unwilling to partake in SCC, as shown below:

*"...there's a break in trust, or the customer didn't feel you were [truthful and honest], you've got a bit of a problem." (P6, male, supply chain optimisation executive)*

Two participants identified a lack of information sharing as a barrier to SCC during SCD recovery because it leads to reduced supply chain visibility during SCD recovery and ultimately dissatisfied customers, as illustrated below:

*"...but that one person that wasn't informed that his parcel burned. He took his business away from us, and it wasn't salvageable." (P3, male, regional manager)*

Five participants indicated that a lack of business acumen hinders effective SCC during SCD recovery, as a lack of experience reduces the ability to partake in SCC, leading to less effective SCD recovery, as indicated below:

*"No, well, I think in a... if there [wasn't] experience then, you know, I think the... the ability to collaborate on... ability to recover after disruption would be a problem." (P13, male, senior supply chain manager)*

Two participants mentioned that having a poor attitude serves as a barrier to SCC during SCD recovery because a poor attitude decreases network partners' willingness to partake in SCC, as illustrated by the following quotation:

*"It's the mindset. If you can't change your mindset, it won't work." (P10, male, business development manager)*

Seven participants identified a poor relationship as an obstacle to SCC during SCD recovery because it reduces trust, which prevents collaborative efforts, as illustrated below:

*"If you can't be honest and truthful... you break that trust in the relationship." (P6, male, supply chain optimisation executive)*



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Four participants indicated that a lack of communication hinders effective SCC during SCD recovery because poor communication prevents a good relationship from forming, which hinders SCC efforts, as indicated below:

*"...you can't, ja... without communication that relationship with your clients will not exist..."(P4, male, import operations manager)*

Six participants mentioned a lack of transparency/honesty as an obstacle to SCC during SCD recovery. This is because a lack of openness with network partners breaks trust and reduces supply chain visibility, ultimately hindering effective SCC, as illustrated by the following quotations:

*"And the transparency. If the people are not transparent about the business, then you cannot trust them with your goods." (P11, female, exports operations manager)*

*"...if a client doesn't give you that visibility and doesn't give you any visibility of what going forward, it's very difficult to collaborate, to actually have some sort of recovery." (P2, male, optimisation manager)*

The existing literature supports the following barriers to SCC: lack of trust, lack of information sharing, non-aligned goals, lack of top management commitment and direction, inter-functional conflict, lack of communication, lack of capability, poor relationships, lack of business acumen and lack of honesty and openness (Barrat, 2004; Ramesh *et al.*, 2010; Richey *et al.*, 2010; Fawcett *et al.*, 2012; Gumboh & Gichira, 2015; Cai *et al.*, 2016). This study also found these barriers present within an SCD recovery context.

## **5. CONCLUSION**

This section provides a discussion of the study's findings, theoretical and managerial implications, limitations and directions for future research.

### **5.1 Summary of findings and theoretical implications**

This study's overall purpose was to investigate the role of SCC between 3PLs and their clients during SCD recovery within a South African context. In addition, this study explored the various tools and techniques used in managing and recovering from SCDs, and the enablers of and barriers to SCC during SCD recovery.

The first research question addresses the role of SCC between 3PLs and their clients during SCD recovery in a South African context. This was done by classifying SCC into four distinct roles based on the elements of SCC's definition and the participant responses. The study

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identified the following four roles of SCC in SCD recovery: facilitating role, contributing role, interconnecting role and retaining role. The findings confirm that the facilitating, contributing and interconnecting roles are present in the existing literature; however, these roles were not formally classified according to their distinguishing characteristics. Additionally, a new SCC role was added to the existing literature: the retaining role that SCC plays in SCD recovery. This role is important as client retention supports business continuity after an SCD has occurred. The highly competitive nature of the 3PL industry means that good relationships between 3PLs and their clients are a prerequisite to business continuity in this industry, as clients could easily switch to an alternative 3PL.

The second research question addresses how 3PLs and their clients collaborate during SCD recovery by identifying various tools and techniques used to manage and recover from SCDs. The various tools and techniques were grouped into four categories: communication tools, IT tools, risk mitigation tools and risk response tools. This study confirms that the use of generic IT tools for SCC exists in the literature, and the researchers also identified these tools as present during SCD recovery. Furthermore, additional SCC tools unique to SCD recovery were found: social media, applications, incident management teams and ICU lists, which thus contribute to the existing literature. It was also found that within a South African context, most participants used simple communication tools instead of advanced IT systems. Firms in developed markets, unlike South Africa, may have more advanced infrastructure and capital to support sophisticated IT systems.

The third and fourth research questions address the enablers of and barriers to SCC between 3PLs and their clients in SCD recovery within a South African context. The study identified 16 enablers and 12 barriers to SCC and classified them as intra-and inter-firm because SCDs may occur internally (intra-firm) and externally (inter-firm). The study identified the following enablers supported by existing literature: information sharing, communication, business acumen, shared objectives, trust, transparency, long-term relationships, corporate culture, honesty and commitment. However, this study found additional SCC enablers unique to SCD recovery: client retention, competent management style, capability, minimising loss, positive attitude, accountability and maturity. Accordingly, these enablers of SCC may not appear in a normal working context but uniquely in an SCD recovery context. In addition, the study identified the following barriers supported by existing literature: lack of trust, lack of information sharing, non-aligned goals, lack of top management commitment and direction, inter-functional conflict, lack of communication, lack of capability, poor relationships, lack of business acumen and lack of honesty/openness.

## 5.2 Managerial implications

This study provides several recommendations to practitioners. Firstly, if practitioners have a better understanding of the roles that SCC plays during SCD recovery, they can capture the benefits of each role. This includes synergistic advantages between network partners such as shared experience and resources, business continuity through client retention and, ultimately, a more effective SCD recovery. Secondly, practitioners would be aware of various tools and techniques used in SCD recovery, such as social media, applications, incident management teams and ICU lists. These tools could be valuable to managers in developing and emerging markets, such as South Africa, as the infrastructure and capital required to implement them may be lower than that of implementing sophisticated IT systems to collaborate in SCD recovery. Lastly, this study makes practitioners more aware of the factors that could prevent SCC during SCD recovery and create an enabling environment for SCC. By understanding these factors, practitioners would know which factors to avoid and focus on, enabling more effective SCC within the firm and between network partners. Finally, if managers understand what drives SCC in SCD recovery, they will realise the benefits associated with SCC, which include increased visibility, flexibility and velocity across network partners' supply chains.

## 5.3 Study limitations and directions for future research

This study has several limitations. Firstly, only six direct relational links were made between 3PLs and their clients; therefore, only 12 of 20 participants could be linked with one another. Some of the 3PLs were unwilling to provide clients referrals, fearing a breach of confidentiality. By having more direct relational links between 3PLs and their clients, a more holistic perspective of SCC could be obtained. Future research should focus on ensuring that all participants have dyadic relationships to identify unique aspects of the collaborative relationship. Secondly, the client firms were not limited to a specific industry. Therefore, the researchers took longer to reach data saturation because of the differing industry characteristics and approaches to managing SCDs. Future research can focus on a specific client industry to better understand specific industry practices. Thirdly, it was difficult to understand the importance of the enablers of and barriers to SCC during SCD recovery. Accordingly, future research should focus on quantitatively measuring the strength and relationships of these enablers and barriers.

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## Appendix A

### Discussion guide

1. Could you think of any disruptions that have occurred between your firm and a 3PL?
  - 1.1 What was the disruption?
  - 1.2 What was your firm's initial response?
  - 1.3 What was your 3PL's initial response?
2. Does your firm take a more proactive or reactive approach to managing disruptions?
  - 2.1 If proactive, could you provide reasons why?
  - 2.2 What tools and techniques are used to proactively manage these disruptions?

- 2.3 If reactive, could you provide reasons why?
- 2.4 What tools and techniques are used to reactively manage these disruptions?
3. Do you have any formal processes in place to manage such disruptions?
  - 3.1 If not, could you provide reasons why there are no processes in place?
  - 3.2 If so, what would be the typical steps followed to manage the disruption after it has occurred?
  - 3.3 Are your 3PLs involved in this disruption recovery process?
  - 3.4 If so, does one party play a more dominant role in the disruption recovery process?
  - 3.5 If not, are there reasons your 3PLs are not involved in this disruption recovery process?
4. Do you actively collaborate with your 3PLs under normal working conditions?
  - 4.1 If so, what tools and techniques are used to collaborate under these conditions?
  - 4.2 If not, could you provide reasons why you do not collaborate?
5. Do you actively collaborate with your 3PLs after a disruption has occurred?
  - 5.1 If so, can you indicate what tools and techniques you use to collaborate with your 3PLs?
  - 5.2 If not, why do you not collaborate with your 3PLs?
  - 5.3 If not, do you still collaborate with your 3PLs under general working circumstances?
6. Why would you make use of supply chain collaboration with your 3PLs to manage and recover from a disruption?
  - 6.1 Could you elaborate on the reason(s) why you would make use of supply chain collaboration?
  - 6.2 Could you elaborate on the reason(s) why you would not make use of supply chain collaboration?
7. What are the factors that drive and enable supply chain collaboration to take place between you and your 3PLs after a disruption has occurred? Could you elaborate on these enablers?
8. Did these factors enable successful recovery from the disruption?
  - 8.1 If so, what were the reason(s) why?
  - 8.2 If not, what were the reason(s) why?
9. What factors prevent supply chain collaboration between you and your 3PLs after a disruption has occurred? Could you elaborate on this?
10. In light of these obstacles to supply chain collaboration, was disruption recovery still successful?
  - 10.1 If so, what is the reason(s) why?
  - 10.2 If not, what is the reason(s) why?