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# RESPONSES TO SUPPLIER-INDUCED DISRUPTIONS: A FUZZY-SET ANALYSIS

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**Supplier-induced disruptions are critical events that can either lead to dysfunctional conflict or spark more fruitful collaboration in buyer–supplier interactions. However, the focus on a single level of analysis in existing research has limited our ability to better understand the complex mechanics linking supplier-induced disruptions and their consequences. Recognizing this need to bridge different levels of analysis, our study builds on event system theory and presents an in-depth qualitative investigation of 60 response processes following supplier-induced disruptions in Western–Chinese buyer–supplier relationships. Using fuzzy-set qualitative comparative analysis (fsQCA), we explore how cognitive, behavioral, and structural factors across the individual and organizational levels of analysis combine in complex ways to give rise to either dysfunctional conflict or constructive interaction in the aftermath of supplier-induced disruptions. Because little is known about the cognitive underpinnings of responses to supply chain disruptions, we investigate the specific role of managerial cognition. To do so, we employ a cognitive-linguistic approach, which maintains that subtle differences in language reflect differences in cognition, for the textual analysis of our 101 interviews across 20 companies. The configurational fsQCA across the individual and organizational level identifies two archetypes associated with dysfunctional conflict and three archetypes associated with constructive interaction. These findings are the foundation of a middle-range theory for responses to supplier-induced disruptions that bridges different levels of analysis and accounts for the role of managerial cognition.**

***Keywords:*** *supplier-induced disruptions; risk; event system theory; behavioral supply management; multilevel analysis; fuzzy-set qualitative comparative analysis*

## INTRODUCTION

Supply chain disruptions, which are unplanned events that affect the normal flow of materials and components within the supply chain (Craighead, Blackhurst, Rungtusanatham & Handfield, 2007), have become a critical issue for companies across industries. If the responsibility for such disruptions rests with the supplier (so-called supplier-induced disruptions), they can put particular stress on the buyer–supplier relationship. Recent examples include defective key components from one of Apple's China-based suppliers that slowed down the release of the Apple Watch (Wakabayashi & Luk, 2015), and a fatal crash linked to Tesla's driver-assistance technology that included components from an Israeli sensor supplier (Higgins, 2016). Although supplier-induced disruptions are by nature an unfortunate event, they can have very different consequences for the relationship between the buying and supplying firm. In the Apple example, the two firms have strengthened their relationship following the disruption, while the Tesla example resulted in a public dispute and the eventual breakup of the strategic partnership. Academic research has pointed to this "double-edged" nature of supplier-induced disruptions, in that they represent both relational risks and relational opportunities (Wang, Craighead & Li, 2014). However, we still know little about which combinations of factors

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contribute to whether supplier-induced disruptions are a spark that eventually ignites more fruitful collaboration or a spark that ignites dysfunctional conflict (henceforth, conflict). Understanding this question is thus a critical next step for supply chain management (SCM) research and practice.

Investigation of this question can build on a large body of literature on buyer–supplier conflict that has examined the role of organization-level governance mechanisms (Bai, Sheng & Li, 2016; Lumineau & Henderson, 2012; Wallenburg & Raue, 2011) and power dynamics (Lee, 2001; Lumineau & Malhotra, 2011; Maloni & Benton, 2000) in mitigating conflict. A separate stream of literature on supply chain disruptions has explored the strategies for preemptively reducing disruption risks (Kleindorfer & Saad, 2005; Speier, Whipple, Closs & Voss, 2011; Zsidisin & Smith, 2005), the capabilities to recover from supply chain disruptions (Blackhurst, Dunn & Craighead, 2011; Craighead et al., 2007), and the performance effects of supply chain disruptions (Hendricks & Singhal, 2005a,b). Furthermore, researchers have recently begun to explore the role of individual-level factors in responses to supply chain disruptions, such as psychological contract breaches (Eckerd, Boyer, Qi, Eckerd & Hill, 2016; Eckerd, Hill, Boyer, Donohue & Ward, 2013) or perceptions of justice (Wang et al., 2014).

Although the extant literature has greatly helped to advance our understanding of responses to supplier-induced disruptions, important research gaps remain in three areas. First, extant studies pertinent to supply chain disruptions and buyer–supplier conflicts mainly focus on a single level of analysis—typically either the organizational level or the individual level (Lumineau, Eckerd & Handley, 2015). The dominance of these single-level perspectives is limiting because disruption response processes are inherently a multilevel phenomenon: They involve individuals embedded within an organizational context (Lumineau et al., 2015; van Vaerenbergh & Orsingher, 2016). Hence, a robust explanation of the complex causal processes in responses that follow supplier-induced disruptions needs to take into account how factors at different levels of analysis combine to shape outcomes. Recognizing this need to bridge different levels of analysis, conceptual works in related fields have recently called for empirical multilevel studies on interorganizational conflict (Lumineau et al., 2015), service recovery (van Vaerenbergh & Orsingher, 2016), and SCM phenomena (Carter, Meschnig & Kaufmann, 2015).

Second, we know remarkably little about the cognitive underpinnings of responses to supply chain disruptions (Eckerd et al., 2016; Ellis, Shockley & Henry, 2011). This is surprising, because individuals ultimately are the ones interacting during such responses and a growing body of behavioral research in diverse fields has highlighted the need to direct attention to individuals' characteristics and behaviors (Felin, Foss & Ployhart, 2015). To better understand the behavior of boundedly rational individuals, behavioral supply management scholars have recently begun to explore the cognitive underpinnings of purchasing managers' decision-making (Carter, Kaufmann & Michel, 2007; Kaufmann, Meschnig & Reimann, 2014). Yet, we still have a limited understanding of the role that managerial cognition—that is, the mental activities involved in managers' information processing (Helfat & Peteraf, 2015)—plays in disruption response processes.

Third, the extant literature has so far investigated either the behavior of the buying firm or the behavior of the supplier. To illustrate, the supply chain disruptions literature has largely focused on the actions of the buying firm in response to upstream supply chain disruptions (e.g., Bode, Wagner, Petersen & Ellram, 2011), while the related service recovery literature has mainly investigated the activities of service providers following a service failure (e.g., Liao, 2007). However, responses to supplier-induced disruptions are inherently dyadic phenomena that involve highly intertwined interactions between both firms. This interdependence suggests that scholars need to examine how buyer-side and supplier-side actions jointly and interactively shape responses to supplier-induced disruptions.

In light of these gaps, our study seeks to develop middle-range theory (Carter, 2011; Craighead, Ketchen & Cheng, 2016) to answer the following research question: *How do cognitive, behavioral, and structural factors combine to shape whether supplier-induced disruptions result in buyer–supplier conflict or in constructive interaction?* Conceptually, we build on event system theory (EST) (Morgeson, Mitchell & Liu, 2015) and the literature pertinent to supply chain disruptions to develop a multilevel framework of responses to supplier-induced disruptions.

To address this question, we conducted an in-depth qualitative study into 60 responses to supplier-induced disruptions—namely quality incidents (QIs). We draw on data generated from 101 in-depth interviews across 20 Western-based companies that source from indigenous Chinese suppliers. To explore the interplay between cognitive, behavioral, and structural factors, we then use fuzzy-set qualitative comparative analysis (fsQCA) (Ragin, 2008). FsQCA as a configurational approach analyzes how different combinations of factors (i.e., configurations) lead to an outcome of interest (Karatzas, Johnson & Bastl, 2016; Ragin, 2008). It is particularly well suited for the present study because it allows us to understand more fully the intricacies of how cognitive, behavioral, and structural factors work together as archetypes. Because the empirical investigation of managerial cognition is

challenging (Kaplan, 2011; Maitland & Sammartino, 2015), we employ a cognitive-linguistic approach (Pennebaker, Francis & Booth, 2001) for the textual analysis of our interviews to gain insights into purchasing managers' cognitive processes.

The study aimed to make two main theoretical contributions. First, we build on the theoretical foundation of EST to develop *middle-range theory* for the *responses to supplier-induced disruptions*. The conceptual framework we derive from EST accounts for how cognitive, behavioral, and structural factors located at different levels of analysis combine in complex ways to affect outcomes. Using the fsQCA methodology allows us to identify two archetypes associated with conflict and three archetypes associated with constructive interaction. These archetypes provide a still parsimonious but more complete account than single-level studies of the conditions under which disruption response processes result in conflict or constructive interaction.

Second, we advance research on the cognitive microfoundations of SCM phenomena (e.g., Stanczyk, Foerstl, Busse & Blome, 2015) by investigating the ways that managerial cognition shapes responses to supplier-induced disruptions. A better understanding of the cognitive underpinnings of SCM can help explain heterogeneity in organization-level supply chain disruption management and guide supply chain managers in their behavior during responses to supplier-induced disruptions.

In the following sections, we introduce the theoretical background, describe the study, and synthesize and discuss the results. We then conclude with suggestions for prospective research and implications for managers.

## THEORETICAL BACKGROUND

This study builds on EST (Morgeson et al., 2015) as a grand theoretical lens to develop middle-range theory, which is more contextualized than grand theories and yields theoretically grounded insights that can be readily applied to an empirical context (Carter, 2011; Craighead et al., 2016). EST bridges feature-oriented theories, which focus on the relatively stable properties of individuals and organizations (e.g., power positions) and process-oriented theories, which focus on change, dynamics, and longitudinal phenomena. At its core, EST describes the causal processes through which events affect behaviors, features, and subsequent events over time and across levels of analysis (Morgeson et al., 2015).

As such, EST appears to be a suitable theoretical lens to help answer our research question for two reasons. First, EST recognizes that the effects of events, in our case supplier-induced disruptions, play out over different *levels of analysis*. Second, EST describes the *processes* through which events (e.g., supplier-induced disruptions) cause outcomes (e.g., conflict). Attention to the causal processes in the event–outcome link helps to unravel the intricacies of how supplier-induced disruptions result in conflict or constructive interaction. Below, we elaborate on three key features of EST: (1) events, (2) multiple levels of analysis, and (3) causal processes.

### Events

Events represent interactions, or "happenings," that occur between entities (e.g., individuals, departments, or organizations); are bounded in space and time; and have a nonroutine character (Langley, Smallman, Tsoukas & Van de Ven, 2013; Morgeson et al., 2015). In the context of our study, supplier-induced disruptions are nonroutine events in that they interrupt the normal flow of materials and components within the supply chain. EST characterizes the *strength* of an event based on its novelty, impact, and criticality (Morgeson et al., 2015). Novelty reflects the degree to which an event differs from current and past events. For example, the eruption of an Icelandic volcano that disrupted air traffic in 2010 was a novel and unanticipated event. Impact reflects the extent of change the event causes in usual activities. Criticality reflects the extent to which an event is important to an entity.

Prior research suggests that the strength of an event plays an important role in responses to supply chain disruptions because the effects of disruptions vary considerably depending on their *severity* (Craighead et al., 2007). In particular, the severity of a disruption might critically influence the (service) recovery process (Craighead, Karwan & Miller, 2004) and increase the risk that a supply chain disruption results in conflict (Jehn, 1997). Therefore, we incorporate severity as a key characteristic of the supplier-induced disruption in our conceptual framework.

### Multiple Levels of Analysis

The term "event space" describes the level of analysis at which an event occurs and how its effects spread through different levels (e.g., individual, organization, or environment level). EST recognizes that events can occur at every level of analysis and that the effects of events can play out both within and across levels. In this study, we adopt two levels of analysis from EST: individual and organizational. The individual level refers to individual actors' cognition and behaviors, whereas the organization level refers to collective behaviors and phenomena, such as buying firm behavior or governance mechanisms, that pertain to the firm (Kozlowski & Klein, 2000).

### Causal Processes

Furthermore, a central tenet of EST is the description of the processes through which events (e.g., supplier-induced disruptions) cause outcomes (e.g., conflict). These causal processes might involve the interplay among relatively enduring features, dynamic behaviors, and cognitive processes. For example, the bankruptcy of a supplier (event) might cause a buying firm to switch to a different supplier (behavior), which changes the structure of the supply chain (feature) and can spark greater alertness for potential bankruptcies (cognitive process), ultimately affecting the buying firm's supply chain resilience (outcome). EST points toward the dynamic interplay of features, behavior, and cognitive processes to explain the causal processes through which events cause outcomes, but as a grand theory, it does not further detail which *specific* factors play a key role in responses to supplier-induced disruptions. In the next section, we therefore turn to the literature pertinent to supply chain disruption management for further guidance.

## LITERATURE REVIEW

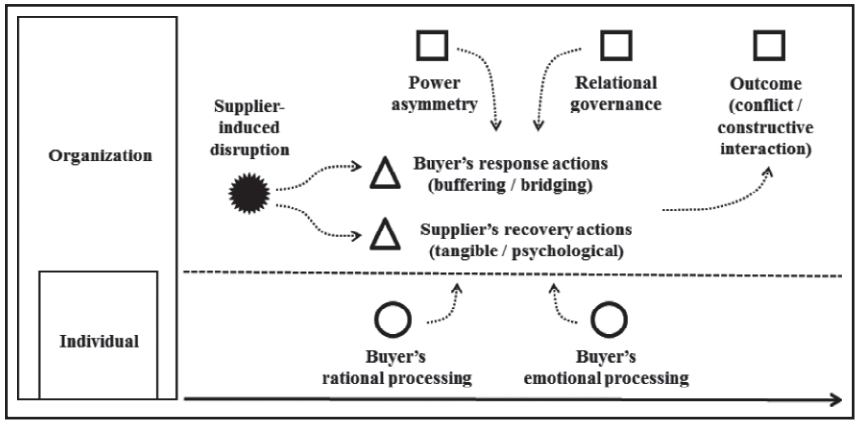
Following a call from Wang et al. (2014), we integrate the supply chain disruptions literature (e.g., Ellis et al., 2011), which focuses on the relationships between buying and supplying firms in the upstream supply chain, and the related field of service recovery research (e.g., van Vaerenbergh & Orsingher, 2016), which examines the downstream relationships between individual customers and their service providers. We complement these two perspectives with insights into organizational-level factors from the literature on buyer–supplier conflicts (e.g., Lumineau et al., 2015) and with recent advances from behavioral supply management research (e.g., Kaufmann, Wagner & Carter, 2017) about the underlying individual-level cognitive processes. Taken together, these literature streams provide significant guidance on the specific factors that might shape responses to supplier-induced disruptions. We organize these factors into a conceptual framework based on EST, which incorporates (1) interorganizational structural states, (2) organizational actions, and (3) individual-level cognitive processes. Figure 1 depicts our conceptual framework.

### Interorganizational Structural States

Structural states specify the conditions that enable and constrain individual and collective action within and across organizations (Ellis et al., 2011; Felin, Foss, Heimeriks & Madsen, 2012). Within organizations, the supply chain disruption and related research has pointed to organizational structures and systems (e.g., level of decentralization) and controls (e.g., rules, reward systems) as enablers of effective responses to supply chain disruptions (Ellis et al., 2011; Smith, Karwan & Markland, 2009). However, in an interorganizational context, the structural states that exert the strongest influence on responses to supplier-induced disruptions pertain to basic characteristics of the buyer–supplier relationship. In particular, in their conceptual framework, Lumineau et al. (2015) draw attention to the importance of governance mechanisms and power asymmetry as key influencing factors on interorganizational conflicts. Hence, we elaborate on governance mechanisms and power asymmetry as two factors that have been found to play a central role in structuring buyer–supplier relationships (Lumineau & Malhotra, 2011).

***Governance Mechanisms.*** Two main types of governance mechanisms exist in buyer–supplier

**FIGURE 1**
**Conceptual Framework of Responses to Supplier-Induced Disruptions**




Legend: △ State □ Event ● Action ○ Cognition ⟶ Effect

relationships. The first mechanism, *contractual governance*, focuses on the importance of contracts and formal rules. The second governance mechanism, *relational governance*, highlights the role of social norms in structuring buyer–supplier relationships (Heide & John, 1992). Relational governance refers to "the reliance upon committed and cooperative relations to govern the commercial exchange" (Handley & Angst, 2015, p. 1413). The distinction between contractual and relational governance has led to an ensuing debate about the relationship between the two types of governance mechanisms (Cao & Lumineau, 2015; Poppo & Zenger, 2002). In this debate, the relationship has often been framed in terms of a polarized "complements versus substitutes" dichotomy, based on an argument that the mechanisms either complement or substitute for each other in their effectiveness (Lumineau & Henderson, 2012).

More recently, researchers have started to move beyond the simplified either/or distinction to investigate the conditions under which relational and contractual governance interact in specific ways (Handley & Angst, 2015; Lumineau & Henderson, 2012). In particular, recent empirical studies find that contractual governance is less effective in environments where legal institutions are weak (e.g., in many emerging markets), and firms seeking to establish partnerships with suppliers in these environments therefore need to rely on relational governance instead (Zhou & Xu, 2012). Because our study is set in the emerging market context, we focus on the role of relational governance.

***Power Asymmetry.*** Power dynamics exert a key moderating effect on buyer–supplier relationships (Handley & Benton, 2012; Petersen, Handfield, Lawson & Cousins, 2008). In particular, extant literature suggests that conflict is more likely if power asymmetry exists between the exchange partners (Lumineau & Malhotra, 2011). Power asymmetry refers to the ability of one firm to control or influence the behavior of the other firm (Hunt & Nevin, 1974). Thus, power asymmetry is the inverse of dependence and reflects the relative power positions of partners in a dyadic relationship (Lumineau & Malhotra, 2011).

Prior research has conceptualized power as comprising two dimensions: mediated power and unmediated power (Belaya, Gagalyuk & Hanf, 2009; Maloni & Benton, 2000). Mediated power rests on the bases of reward, coercive, and legal legitimate power; it involves strategies that are deliberately administered to influence the behavior of the target (Benton & Maloni, 2005). Unmediated power includes the referent and expert power bases; it cannot be deliberately employed but instead depends on the perceptions and opinions that one party holds about the other (Benton & Maloni, 2005). In this article, we focus our analysis on the effects of mediated power because—in contrast to unmediated forms of power—companies can deliberately use mediated power to influence buyer–supplier relationships (Benton & Maloni, 2005; Handley & Benton, 2012). As such, investigating mediated power allows for more actionable insights.

## Organizational Actions

A question of particular interest to the supply chain disruption literature focuses on what firms actually do to reduce or manage the adverse effects of supply chain disruptions (Bode, Hübner & Wagner, 2014). These behaviors can be categorized into buyer-side and supplier-side responses. In contrast to previous literature, which has largely examined buyer-side and supplier-side actions in isolation, this study seeks to integrate both perspectives to account for the interplay of the buyer's and the supplier's behavior. On the buyer side, the supply chain disruptions literature has identified two generic actions that buying firms can adopt in response to supplier-induced disruptions—namely buffering and bridging (Bode et al., 2011, 2014). On the supplier side, the service recovery literature has largely focused on the behaviors service providers use in response to service failures (Liao, 2007; van Vaerenbergh & Orsingher, 2016). In particular, the literature distinguishes between psychological recovery activities (e.g., apologies) and tangible recovery activities (e.g., extra compensation) (Miller, Craighead & Karwan, 2000). Next, we briefly discuss the buyer-side and supplier-side responses in more detail.

***Buyer-Side Responses.*** The two buyer-side generic responses, buffering and bridging, differ in their degree of cooperativeness. *Buffering* is an uncooperative approach that tries to mitigate the detrimental consequences of external disturbances (Bode et al., 2014). To illustrate, in buffering responses firms can use various forms of slack, such as larger inventories or backup suppliers, to "absorb the shocks" from supplier-induced disruptions. In contrast, *bridging* is a more cooperative approach that seeks to improve the relationship with the suppliers (Bode et al., 2014). Firms using bridging actions in response to supplier-induced disruptions can modify the exchange relationship by strengthening links with influential individuals in the supplier firm, initiating collaborative initiatives, or intensifying information exchange. The approaches of buffering and bridging are not mutually exclusive. Depending on the specific context, either of them or a combination might be an effective response to supplier-induced disruptions (Bode et al., 2011). However, our understanding of *how* and *when* the mechanisms effectively play out in disruption response processes so far remains limited. Our study intends to address this research gap.

***Supplier-Side Responses.*** Service recovery activities are the actions service providers take in response to

service failures (Miller et al., 2000; van Vaerenbergh & Orsingher, 2016), such as apologizing, responding promptly, or providing extra compensation (Liao, 2007). In the context of supply chain disruptions, we define supplier-side recovery actions as the activities supplying firms undertake to ameliorate supplier-induced disruptions. We build on the two established categories of recovery actions: psychological actions and tangible actions (Craighead et al., 2004; Miller et al., 2000; Schweikhart, Strasser & Kennedy, 1993). *Psychological recovery actions* are intended to alleviate the situation by showing concern for the buying firm's needs, such as making an apology, being courteous, and providing an explanation. *Tangible actions* are intended to quickly reinstate the supply or compensate for real and perceived damages. They might include problem-solving, prompt handling, or providing extra compensation.

As Schweikhart et al. (1993) point out, recovery actions "are designed to alter customer perceptions through *cognitive* (information-based) and/or *affective* (emotional) processes" (p. 5, emphasis added). Although prior literature has shed significant light on the psychological *outcomes* of supplier-side recovery actions for the buying firm, such as the buyer's perception of justice (e.g., Wang et al., 2014), we still lack a full understanding of how cognitive (i.e., both rational and affective) processes of buyers shape their response to supplier-induced disruptions. A better understanding of the role of cognitive processes underlying the relationship between events and outcomes also was identified as an important avenue for future research to advance EST (Morgeson et al., 2015). To address this call, we next turn to behavioral supply management research.

### Individual-Level Cognitive Processes

Recent behavioral supply management research (Kaufmann et al., 2014, 2017) has investigated purchasing managers' cognition through the lens of dual-process theories. These dual-process theories (Evans, 2008; Kahneman, 2011) suggest that two distinct modes of information processing exist. Following advances in cognitive neuroscience (Lieberman, 2007), our study draws in particular on the reflection–reflexion model, which distinguishes rational, reflective processes (C-system) from affective, reflexive processes (X-system) (Healey, Vuori & Hodgkinson, 2015; Lieberman, 2007).

***Rational and Affective Processes.*** The C-system, associated with reflective processes and *reasoning*, operates more slowly and on the basis of causal and logical relations (Gawronski & Creighton, 2013). Meanwhile, the X-system, associated with reflexive processes, includes *emotions* and operates on the basis of similarity and pattern matching (Evans, 2008; Gawronski & Creighton, 2013). Whereas X-system processes are affective in nature and are thus associated with "hot" cognition (Epstein, 1994; Strack & Deutsch, 2004), the C-system deals in "cold" (i.e., unfeeling) cognition (Healey et al., 2015). The reflection–reflexion model suggests that the two systems can operate simultaneously and interact in complex ways because they involve different neural regions of the brain (Lieberman, 2007).

We argue that these processing mechanisms deserve more attention in research on disruption response processes because rational and affective processes might influence the behavior of individuals during such responses in differential ways. Rational processes tend to influence reasoned and planned behavior through conscious intention, whereas affective processes tend to guide spontaneous actions that occur with little deliberative reasoning (Healey et al., 2015). Investigating the processing mechanisms that underlie the behavior of individuals during responses to supplier-induced disruptions can thus help us to gain deeper insights into the conditions under which these disruptions result in buyer–supplier conflict versus constructive interaction.

## RESEARCH METHODOLOGY

To address our research question of how cognitive, behavioral, and structural factors combine to shape whether supplier-induced disruptions result in buyer–supplier conflict or in constructive interaction, we conducted an in-depth qualitative study into 60 response processes to supplier-induced disruptions. The unit of analysis is the response to supplier-induced disruptions in Western buyer–Chinese supplier relationships. In our study, the country of origin is denoted by the location of the firm's headquarters. The term "West" refers to North America and Western Europe, and "China" refers to mainland China. We build on data generated from 101 in-depth interviews with multiple sources at 20 Western-based companies that source from indigenous Chinese suppliers. Qualitative data are particularly well suited to explaining dynamic processes—especially for answering the explanatory "how" and "why" questions about causal processes that need to be traced across different levels of analysis (Bansal & Corley, 2011).

### Sample Selection

Western buying firms' sourcing from indigenous Chinese suppliers is a particularly appropriate context for our study. First, China as an emerging market provides a highly dynamic environment; it is characterized by uncertainty, volatility, and a fast pace of change (Flynn, Huang & Zhao, 2015), all of which increase the risk for supplier-induced disruptions. Second, the often-reported gaps in technological and managerial capabilities between Western buyers and

indigenous Chinese suppliers (e.g., Busse, Kach & Wagner, 2016; Busse, Schleper, Niu & Wagner, 2016) were expected to increase the risk of quality problems in the supply chain. Third, the high psychic distance between the firms' home countries (Johanson & Vahlne, 2009) points to a higher potential for conflict during the response process.

Our theoretical sampling strategy regarding the Western buying firms focused on exemplars (Pagell & Wu, 2009) in quality management. Given their outstanding track record in quality management, these companies likely have devised better practices for the management of quality-related supply chain disruptions than their competitors. This sampling allows us to attribute challenges in the disruption response processes to factors other than the lack of standard best practices for disruption management at the buying firms. We further followed the theoretical sampling principle (Corbin & Strauss, 2008) to represent variance at the firm level (e.g., firm size, industry, type of production process) and the subsidiary level (e.g., strategic importance of the Chinese market to the buying firm). Our final sample includes 20 leading manufacturing firms that have a reputation for high-quality products, as indicated by their receipt of quality awards, their brand rankings, and by third-party quality certificates. Table 1 provides summary information on the 20 buying firms.

### Data Collection

Data were collected through semi-structured interviews with multiple key informants within each buying firm and with representatives from selected suppliers, complemented by a follow-up survey, archival documents, and observations. We conducted a total of 101 in-depth, semi-structured interviews ranging from 40 to 180 min, with an average duration of 85 min. All interviews were recorded, transcribed verbatim, and translated as necessary (i.e., from Chinese to English). In each buying firm, a high-level purchasing manager helped identify informants in boundary-spanner roles (i.e., persons who facilitate significant interactions with the supplier) (Barner-Rasmussen, Ehrnrooth, Koveshnikov & Mäkelä, 2014; Leifer & Delbecq, 1978). These informants turned out to be purchasing managers and supplier quality managers (SQMs) who had direct interaction with Chinese suppliers on a regular basis. They represented multiple levels of management, and their titles included head of purchasing, global sourcing manager, head of international purchasing office, and supplier quality engineer (SQE). The interview guideline (see Online Supplement A) was developed from the extant literature and used the critical incident technique (CIT) (Flanagan, 1954) to collect data about specific QIs and the subsequent response processes (cf. Wang et al., 2014). Thus, QIs are the particular type of supplier-induced disruption examined in this research. During the interviews, we asked respondents to recall two major QIs (polar cases) that occurred within the past 18 months and in which the *disruption response process* with the supplier led to, in the first case, serious conflict and, in the second case, constructive interaction. In total, we collected data on 66 QIs, six of which were excluded from the analysis because they had occurred more than 18 months ago.

To complement our interview data and to further increase the substantive knowledge required to inform the fsQCA (Ragin, 2008), we observed interactions between buyer and supplier personnel and conducted tours of the facilities at selected suppliers. For example, we joined quality review meetings on-site at one of MachineCo A's key suppliers in China and spent two days observing SteelCo's quality supervisors as they worked at the supplier site. In total, we conducted more than 12 days of nonparticipant observation at 10 suppliers, plus tours of production facilities at seven additional suppliers. These observations have been documented in photographs, videos, and field notes, and they have been triangulated with the interview data on the QIs. Through the course of our study, we also collected archival data from buyer and supplier firms in the form of publicly available documents (e.g., industry reports, annual reports), as well as company-internal documents (e.g., quality reports, email conversations on QIs, and standard operating procedures).

### Within-Case Analysis

Our analysis proceeded in two stages. In the first stage, we built 60 case histories of the QIs discussed during the interviews to draw a rich picture of the response process within each case. Each QI was summarized in a case study report, which includes a graphical timeline. In the case study reports, we used citations from interviews, photographs, and other collected documents to stay close to the original data and thus to achieve high levels of accuracy. This analysis phase involved moving back and forth between our empirical data and existing theory in an iterative fashion (Corbin & Strauss, 2008) and was very helpful to further refine our conceptual model. To ensure reliability of our data, the drafts of the case study reports were reviewed by the interviewees. Online Supplement B provides an overview of all the QIs.

## FUZZY-SET QUALITATIVE COMPARATIVE ANALYSIS

In the second stage, we employed fsQCA (Ragin, 2008) to identify configurations (i.e., combinations of causal conditions) associated with buyer–supplier conflict or constructive interaction across cases. FsQCA, which has received growing attention in management

**TABLE 1**

**Overview of Buying Firms**

| Firm[a] | Major Products | # Employees[a] | Revenues (USD)[a] | Share of Revenue Contributed by China (%)[b] | China Sourcing Ratio (%)[c] | Strategic Importance of China[d] | # Informants (Thereof in Subsidiary) | Example Informant Titles | Average Years at Firm |
|---|---|---|---|---|---|---|---|---|---|
| WheelCo A | Interior equipment | 10,000 | 2 billion | 10 | 30 | High | 5 (3) | Head of Supplier Quality Development | 8 |
| WheelCo B | Locking systems | 5,000 | .7 billion | 15 | 20 | High | 6 (4) | Head of Purchasing, Supplier Quality Manager | 6 |
| WheelCo C | Bearings | 80,000 | 10 billion | 15 | 15 | Medium | 2 (2) | Senior Supplier Quality Manager | 4 |
| WheelCo D | Braking systems | 70,000 | 20 billion | 15 | 15 | Medium | 4 (3) | Senior Purchasing Manager Asia Pacific | 10 |
| ConnectCo A | Circuit connectors | 80,000 | 15 billion | 15 | 10 | Medium | 5 (4) | Head of International Purchasing Office | 6 |
| ConnectCo B | Circuit connectors | 50,000 | 5 billion | 30 | 40 | High | 9 (5) | Supplier Quality Manager, Purchasing Manager | 10 |
| VehicleCo | Trucks | 300,000 | 140 billion | 10 | 5 | Medium | 4 (2) | Global Sourcing Manager, Supplier Quality Manager | 19 |
| ChemCo A | Agrochemicals | 120,000 | 50 billion | 10 | 15 | Medium | 4 (3) | Purchasing Manager, Quality Manager | 6 |

(continued)

**TABLE 1** (continued)

| Firm[a] | Major Products | # Employees[a] | Revenues (USD)[a] | Share of Revenue Contributed by China (%)[b] | China Sourcing Ratio (%)[c] | Strategic Importance of China[d] | # Informants (Thereof in Subsidiary) | Example Informant Titles | Average Years at Firm |
|---|---|---|---|---|---|---|---|---|---|
| ChemCo B | Adhesives | 50,000 | 20 billion | 10 | 10 | Medium | 4 (3) | Supplier Quality & Development Manager Asia Pacific | 15 |
| HairCo | Hairdressing supplies | 500 | .1 billion | 0 | 10 | Low | 3 (1) | Global Sourcing Manager, Supplier Quality Manager | 5 |
| ApplianceCo | Household appliances | 20,000 | 4 billion | 15 | 10 | Medium | 3 (1) | Strategic Purchaser, Supplier Quality Manager | 8 |
| EnerCo | High-voltage products | 300,000 | 80 billion | 10 | 10 | Medium | 4 (2) | Supplier Quality Engineer | 8 |
| SteelCo | Steel and rolling mills | 10,000 | 2 billion | 20 | 10 | Medium | 6 (3) | Head of International Purchasing Office, Senior Quality Manager | 20 |
| MachineCo A | Packaging machines | 500 | .5 billion | 70 | 10 | Medium | 3 (2) | Global Sourcing Manager, Quality Manager | 8 |
| MachineCo B | Packaging machines | 500 | .2 billion | N/A | 10 | Low | 3 (1) | Head of Quality, Strategic Purchaser | 10 |
| MachineCo C | Textile machines | 5,000 | 3 billion | 30 | 25 | High | 3 (3) | Head of Purchasing, Quality Manager | 11 |

(continued)

**TABLE 1** (continued)

| Firm[a] | Major Products | # Employees[a] | Revenues (USD)[a] | Share of Revenue Contributed by China (%)[b] | China Sourcing Ratio (%)[c] | Strategic Importance of China[d] | # Informants (Thereof in Subsidiary) | Example Informant Titles | Average Years at Firm |
|---|---|---|---|---|---|---|---|---|---|
| MachineCo D | Packaging machines | 2,000 | .5 billion | N/A | 1 | Low | 5 (2) | Global Sourcing Manager | 15 |
| OptiCo A | Optical devices | 1,000 | .2 billion | 0 | 10 | Low | 3 (1) | Head of Purchasing, Supplier Quality Manager | 22 |
| OptiCo B | Optical devices | 150,000 | 15 billion | 25 | 70 | High | 4 (1) | Senior Supply Chain Manager, Supplier Quality Engineer | 8 |
| PackCo | Plastic packaging | 3,000 | .3 billion | N/A | 5 | Low | 3 (1) | Purchasing Manager, Supplier Quality Manager | 14 |

[a]Real names are concealed and numbers rounded for confidentiality.
[b]Ratio of revenue contributed by China to total revenue.
[c]Ratio of direct spend volume in China to total direct purchasing volume.
[d]high: ≥10% revenue contributed by China and ≥20% China sourcing ratio; medium: ≥10% revenue contributed by China or ≥20% China sourcing ratio; low: <10% revenue contributed by China and <20% China sourcing ratio (Jia, Lamming, Sartor, Orzes & Nassimbeni, 2014).

research (e.g., Vergne & Depeyre, 2016) and has recently been introduced to the SCM field (Karatzas et al., 2016), uses set-theoretic logic to investigate the configurations of conditions related to an outcome of interest. This approach bridges conventional qualitative and quantitative analyses by combining the complexity of case analysis with a degree of generalizability through formal analysis (Crilly, 2011).

Because an in-depth explanation of the fsQCA method is beyond the scope of this paper, we point readers to Karatzas et al. (2016) and the primer on fsQCA in Greckhamer (2016) for a detailed explanation. The core idea of fsQCA is that causation is complex, which means that "an outcome may follow from several different combinations of causal conditions" (Ragin, 2008, p. 23). This view of causality implies that multiple alternative configurations leading to an outcome may exist (Ragin, 2000, 2008), which likely is the case in our empirical setting, given the complex and multifaceted nature of responses to supplier-induced disruptions.

FsQCA is particularly well suited for this study because the method lends itself to the use of intermediate-N research designs for the purpose of developing middle-range theory based on extant theory (Marx, Rihoux & Ragin, 2014). Our intermediate sample ($N$ = 60 QIs) is consistent with sample sizes in prior fuzzy-set studies (e.g., Crilly, 2011; Pajunen, 2008). Because the number of cases restricts the number of causal conditions that fsQCA models can handle (Fiss, 2011, p. 412), intermediate-N sample sizes balance the tradeoff between the ability to analyze complex configurations and the researcher's familiarity with the individual cases (Ragin, 2000). FsQCA is also particularly well suited for advancing multilevel theory because it helps to identify how multiple factors located at different levels of analysis combine in complex ways to produce outcomes (Lacey & Fiss, 2009). Employing the fsQCA method is thus consistent with our aim of understanding complex causal processes across levels of analysis.

Fuzzy-set analysis proceeds in several steps (Fiss, 2011; Ragin, 2008). The first step is to calibrate set membership. Unlike variable-oriented approaches that treat all variance as equally important, in fsQCA the aim is to calibrate set membership in such a way that degrees of membership represent meaningful groupings of cases (Crilly, 2011; Ragin, 2008). Fuzzy-sets allow researchers to account for the varying degrees of membership in a set by assigning values between 0 and 1.[1] As recommended by Ragin (2008), our calibration was informed by the existing literature and in-depth empirical knowledge of the cases. Where our analysis was based on quantitative measures, we used the direct method of calibration with three anchor points (1 = fully in; .5 = the crossover point; 0 = fully out) to transform the measures into fuzzy-set membership scores (Ragin, 2008). Where the calibration was based on qualitative data, we used the indirect method of calibration to code our QIs. Our coding scheme employed the established six-level scale (0 = fully out; .2 = mostly but not fully out; .4 = more or less out; .6 = more or less in; .8 = mostly but not fully in; 1 = fully in) for fsQCA (e.g., Vergne & Depeyre, 2016). Interviews were coded by at least two researchers, and discrepancies were resolved by a panel of three researchers using evidence from the data. We discuss our calibration of the outcome and causal conditions in the following paragraphs.

[1]Because cases with scores of exactly .5 are difficult to analyze, we avoided the use of a precise .5 fuzzy-set membership score for causal conditions, as recommended by Fiss (2011). To do so, a constant of .001 was added to the causal conditions whenever the scores were less than 1.

### Calibration of Outcomes

The outcomes of interest in the current study are the extent of conflict or constructive interaction in the aftermath of supplier-induced disruptions. Buyer–supplier conflict refers to frictional events during the interaction process that influence the pattern of the exchange relationship (Mele, 2011). Although conflict generally can produce both positive and negative effects on exchange relationships, this study uses the term conflict in the sense of destructive conflicts. Based on the polar cases elicited through the critical incident technique (CIT), we distinguished QIs characterized by a high degree of conflict from those characterized by a high level of constructive interaction. Because we sampled polar cases, our QIs cover completely opposite phenomena and thus capture two distinct constructs for the outcome.

***High Conflict.*** We calibrated membership in the set of QIs involving high conflict based on the extent of friction experienced with the supplier following responses to supplier-induced disruptions, as perceived by the buying firm. We allocated membership scores based on the above six-level scale. For example, the QI "foundry relocation" (Q20) was coded as fully in (1), as VehicleCo desourced its supplier of iron casting parts after the supplier violated change management requirements: "There was no way we could continue working with this supplier when the situation was handled in such an unprofessional way" (Global Sourcing Manager, X37, VehicleCo).

***Constructive Interaction.*** We also sought to understand how the causal conditions combine in constructive response processes. We calibrated membership in the set of QIs that involved frictionless, constructive interaction with the supplier, as perceived by the buying firm, on the above six-level scale. For example, the QI "lens contrast" (Q44) was coded as fully in (1), as OptiCo B was extremely satisfied with the response

process: "We had very good and prompt communication, the supplier was extremely cooperative" (Quality Manager, X96, OptiCo B). Table 2 illustrates the indirect calibration of the sets of QIs involving high conflict or constructive interaction.

### Calibration of Causal Conditions

Drawing on the conceptual framework and the in-depth knowledge of our cases, we considered eight causal conditions that might influence whether responses to supplier-induced disruptions result in conflict or constructive interaction. One causal condition—disruption severity—characterizes the strength of the event. Two causal conditions—relational governance and buyer dominance—represent structural features at the organizational level. Two causal conditions—buffering and bridging actions—address the buyer-side responses, and another causal condition describes the supplier-side recovery actions at the organizational level. Two further causal conditions—

**TABLE 2**

**Illustration of Indirect Calibration of Outcome**

| Calibration of Outcomes | Conflict | Constructive Interaction |
|---|---|---|
| 0 (fully out) | Response process involved no friction. (Because we sampled polar cases, all QIs with constructive interaction match this calibration.) | Response process involved no constructive interaction. (Because we sampled polar cases, all QIs with conflict match this calibration.) |
| .2 (mostly but not fully out) | Response process involved very little friction. (Because we sampled polar cases, no QI in our sample matches this calibration.) | Response process involved very little constructive interaction. (Because we sampled polar cases, no QI in our sample matches this calibration.) |
| .4 (more or less out) | Response process involved limited amount of friction. Example: "The supplier had sent forged inspection protocols in the past, so we needed an audit to check how the supplier makes its inspection reports." (Q43, Lens cleanliness, Quality Manager, X96, OptiCo B) | Response process involved limited amount of constructive interaction. (Because we sampled polar cases, no QI in our sample matches this calibration.) |
| .6 (more or less in) | Response process involved moderate friction. Example: "The supplier is willing to solve the quality problems, but the claim costs that PackCo demands are too high. [. . .] This situation is very difficult to negotiate." (Q27, Aluminum foil, Sales Manager, X101, PackCo) | Response process involved moderate constructive interaction. Example: "The supplier readily accepted most of our suggestions for improvement but was not willing to invest in an improved testing machine." (Q29, Hairdressing chair, Head of Purchasing, X51, HairCo) |
| .8 (mostly but not fully in) | Response process involved significant friction. Example: "The supplier did not pay attention to our complaint. [. . .] We've taken three steps before the supplier acknowledged the complaint." (Q23, Short weight, SQM, X47, ChemCo B) | Response process involved significant constructive interaction. Example: "This was efficient cooperation based on mutual cooperation and problem-solving." (Q33, Castings roughness, SQE, X62, EnerCo) |
| 1 (fully in) | Response process involved extensive friction. Example: "The supplier was hiding behind various excuses. He did not understand what he was doing; he completely lacked any quality philosophy [. . .] We could not trust them anymore." (Q20, Foundry relocation, Global Sourcing Manager, X37, VehicleCo) | Response process involved extensive constructive interaction. Example: "This incident showed us that it is possible to successfully tackle a difficult topic, over a large distance, with language barriers, and different technology levels—and in fact it was possible in a relatively short time frame." (Q39, Lens transmission, Head of Purchasing, X91, OptiCo A) |

affective processing and rational processing—capture the cognitive processes of the buying firm's boundary spanners at the individual level. Table 3 displays the calibration thresholds and sample descriptives of the underlying measures for the direct calibration of the cognitive processes. Table 4 illustrates the indirect calibration of the other causal conditions.

***High Disruption Severity.*** Drawing on EST, we conceptualize three dimensions of disruption severity: novelty, impact, and criticality. Membership in the set of QIs with high severity was assigned on the basis of the point at which the quality problem surfaced (e.g., incoming inspection, customer complaint), the escalation level at the buyer, the QI's potential effect on production, the degree of time pressure involved, and the buying firm's prior experience with the particular type of quality problem. For example, the QI "metal ring" was "a very, very critical issue" (X14, SDM, WheelCo C) that affected several countries and was quickly escalated to the management level, and it was thus coded as fully in (1).

***Relational Governance.*** We further calibrated membership in the set of QIs with strong relational governance. Because contracts have been shown to be less effective in governing buyer–supplier relationships in emerging markets (Zhou & Xu, 2012), we only included the strength of relational governance in our main analysis. Our coding was informed by established measures of the relational governance construct from the literature—in particular, the extent to which the buyer–supplier relationship was viewed as a partnership and a cooperative effort and how much the partners worked together to achieve mutual goals (Handley & Angst, 2015). For example, WheelCo B's Purchasing Manager (X10) described the relationship as a "partnership" and the supplier as "willing to grow together with WheelCo B," which was coded as fully in (1).

***Power Asymmetry (Buyer Dominance).*** We measured power asymmetry in terms of mediated power, which rests on the bases of reward and coercive power (Benton & Maloni, 2005; Handley & Benton, 2012; Terpend & Ashenbaum, 2012). We did not include the legal legitimate basis of power because contract enforcement in emerging markets has repeatedly been found to be difficult (Zhou & Xu, 2012). Reward power refers to the ability of the power source to give benefits to the other firm, such as the buying firm's power to award additional business to a supplier. Coercive power, in turn, is the ability to punish the other firm, such as the supplier's power to stop delivery of a critical component (French & Raven, 1959; Terpend & Ashenbaum, 2012). Because distinguishing reward and coercive power conceptually is very difficult (Handley & Benton, 2012), we group both power bases together in our operationalization of mediated power.

Our coding of power asymmetry in terms of mediated power was informed by three different sets of indicators (Lumineau & Malhotra, 2011; Touboulic, Chicksand & Walker, 2014): First, *asymmetry of firm size*, operationalized as the ratio of the buying firm's number of employees to the supplier's number, reflects the relative firm strength. The number of employees was used rather than revenues because obtaining reliable revenue data from emerging market suppliers is challenging. Second, the buyer's current *share of the supplier's annual sales* and the *growth potential* of this share approximate sources of mediated power on the buying firm side. Third, the *availability of alternative sources of supply* and the buying firm's *switching costs* indicate sources of mediated power on the supplier side. Although the directionality of power asymmetry can theoretically run either way (Touboulic et al., 2014), in our sample only the buying firm was found to possess a power advantage. We therefore

**TABLE 3**

**Direct Calibration of Causal Conditions and Description of Sample**

| | | Fuzzy-Set Calibrations | | | Measure Descriptives | | | |
|---|---|---|---|---|---|---|---|---|
| Causal Conditions | Fuzzy-Set/Measure | 1 (Fully In) | .5 (Crossover) | 0 (Fully Out) | Mean | SD | Max | Min |
| Affective processing | The percentage of words in the interviews that indicate either positive or negative emotions | 5.00 | 3.50 | 2.00 | 3.57 | .75 | 6.41 | 1.84 |
| Rational processing | The percentage of words in the interviews that are related to reasoning or cognitive mechanisms | 17.00 | 13.00 | 9.00 | 13.27 | 2.11 | 18.56 | 9.10 |

**TABLE 4**

**Illustration of Indirect Calibration of Causal Conditions**

| Calibration of Causal Conditions | 0 (Fully Out) | .2 (Mostly but not Fully Out) | .4 (More or Less Out) | .6 (More or Less In) | .8 (Mostly but not Fully In) | 1 (Fully In) |
|---|---|---|---|---|---|---|
| High disruption severity | Very low severity. Example: "A simple case" (Q10) | Low severity. Example: Typical defect, few parts affected, noticed during assembly (Q16) | Limited severity. Example: Typical defect, delivery deadline threatened, noticed during incoming inspection (Q47) | Moderate severity. Example: Serious functional problem, not time sensitive, noticed during assembly (Q55) | High severity. Example: Noticed during testing, entire supply chain put on hold (Q37) | Very high severity. Example: "We were close to production breakdown" (Q11) |
| Relational governance | Very weak relational governance. Example: No strategic alignment, "not fit to each other" (Q13) | Weak relational governance. Example: Transactional relationship, "little red tape" (Q24) | Limited relational governance. Example: Limited mutual interests, rather arm's length (Q46) | Moderate relational governance. Example: Best supplier award, reciprocal relationship (Q05) | Strong relational governance. Example: "Strong personal relationship" (Q29) | Very strong relational governance. Example: "Strategic cooperation" (Q01) |
| Buyer dominance | No buyer dominance. Example: Buyer five times larger in size, accounting for less than 5% of supplier's sales, yet locked in for current project (Q08) | Almost no buyer dominance. Example: Buyer accounting for 10% of supplier's sales, yet few viable alternatives in Chinese market (Q56) | Limited buyer dominance. Example: Roughly equal in firm size, accounting for less than 10% of supplier's sales (Q07) | Some buyer dominance. Example: Among top 5 customers, accounting for 10% of supplier's sales, standard parts (Q10) | Significant buyer dominance. Example: Ten times larger in size, among top 3 customers, accounting for 15% of supplier's sales (Q38) | Extensive buyer dominance. Example: Most important customer, accounting for 40% of supplier's sales (Q51) |
| Buyer buffering actions | No buffering actions. Example: Directly solved problem with | Very few buffering actions. Example: Sorting of defective parts (Q25) | Limited buffering actions. Example: Reworking defective parts internally (Q59) | Some buffering actions. Example: Laboratory testing, stricter | Significant buffering actions. Example: Switching to old molding tool as | Extensive buffering actions. Example: Implementing 100% inspection, securing supply |

(continued)

TABLE 4 (continued)

| Calibration of Causal Conditions | 0 (Fully Out) | .2 (Mostly but not Fully Out) | .4 (More or Less Out) | .6 (More or Less In) | .8 (Mostly but not Fully In) | 1 (Fully In) |
|---|---|---|---|---|---|---|
| | current supplier (Q35) | | | third-party inspection (Q37) | interim solution (Q06) | via air freight (Q17) |
| Buyer bridging actions | No bridging actions. (No empirical case matches this calibration) | Very few bridging actions. Example: Sending detailed complaint report (Q30) | Limited bridging actions. Example: Limited information exchange, such as providing before-and-after pictures and suggestions (Q52) | Some bridging actions. Example: Information exchange to "support the supplier in improving the quality together" (Q44) | Significant bridging actions. Example: Top management meeting, intensified on-site monitoring (Q59) | Extensive bridging actions. Example: Top management visits, extensive technical assistance (Q39) |
| Supplier tangible recovery actions | No tangible recovery activities. Example: Refused to rework defective parts, "No interest in manufacturing the order again" (Q59) | Very few tangible recovery activities. Example: Initially threatened to stop supplying the product, eventually improved quality (Q26) | Limited tangible recovery activities. Example: Initially rejected claim, but later remanufactured parts and paid claim costs (Q56) | Some tangible recovery activities. Example: Improved inspection tool, but only step by step (Q36) | Significant tangible recovery activities. Example: Quick response speed, problem solved, but no investment in improvement measure (Q12) | Extensive tangible recovery activities. Example: Immediately visited customer site, reworked parts, implemented improvement measure (Q49) |
| Supplier psychological recovery actions | No psychological recovery activities. Example: "A blockade mentality" (Q08) | Very few psychological recovery activities. Example: Supplier "felt wrongly punished" (Q59) | Limited psychological recovery activities. Example: "Supplier indicated that he did not deem the changes important" (Q37) | Some psychological recovery activities. Example: Apology letter, but atmosphere that was "a bit frosty" (Q56) | Significant psychological recovery activities. Example: Mostly matter-of-fact and cooperative (Q58) | Extensive psychological recovery activities. Example: Supplier "cooperative with everything" (Q42) |

calibrated membership in the set of QIs with buyer dominance based on the indicators described. For example, MachineCo B's mediated power position over its machining parts supplier was coded as fully in (1) because of three indicators: (1) MachineCo B was more than 15 times the supplier's size; (2) it accounted for more than two-thirds of the supplier's sales; and (3) it sourced standard machining parts with low switching costs.

***Buyer-Side Buffering Actions.*** We assessed membership in the set of QIs with a high use of buffering actions in terms of the buffering activities that the buying firm pursued in response to the supplier-induced disruption, such as building up inventory or time buffers, internal reworking of defective parts, or instituting 100% incoming inspection. For example, in the QI "lock holder" (Q11), WheelCo B started to fly in parts from a European second source to become less dependent on the Chinese supplier and thus the QI was coded fully in the set (1): "For the worst case, we said: We fly in parts, so that at least we have some safety stock" (X6, Strategic Purchaser, WheelCo B).

***Buyer-Side Bridging Actions.*** We further calibrated membership in the set of QIs with a high use of bridging actions based on the bridging activities (e.g., on-site support, top management meetings) that the buying firm undertook during the response process. For example, WheelCo B held meetings with the supplier's top management and provided extensive technical assistance in the QI "lock holder" (Q11), and thus, this QI was coded as fully in (1): "We sent our supplier quality employees to the supplier site for several weeks" (X10, Purchasing Manager, WheelCo B).

***Supplier-Side Recovery Actions.*** We calibrated membership in the set of QIs with a high use of *tangible* recovery actions based on three specific recovery behaviors: problem-solving, prompt handling, and providing extra compensation (Liao, 2007). In particular, our coding was informed by the behavioral measures for these dimensions, as outlined by Liao (2007) and Miller et al. (2000). For example, ChemCo A's supplier quickly delivered a new, qualified batch and invested in a new filling machine in the QI "impurities" (Q21), and thus, this QI was coded as fully in (1). The extent to which the supplier used *psychological* recovery actions was assessed based on the three specific recovery behaviors of making an apology, being courteous, and providing an explanation (Liao, 2007; Miller et al., 2000). For example, in the QI "impurities" (Q21), "the supplier's attitude is very good" (X43, Quality Manager, ChemCo A), and the QI was coded as fully in (1). Because the fsQCA methodology allows only for a limited number of causal conditions, we followed Ragin's (2008) suggestion to keep the number of causal conditions low using higher order concepts, combining both dimensions of recovery actions (tangible and intangible) into the higher order concept, "supplier-side recovery actions." We calculated the score for this higher order concept using the higher of the calibration scores of tangible and intangible recovery actions, assuming that both dimensions are indicative of the supplier's level of cooperativeness. We also reran the analyses with both tangible and intangible recovery actions included as separate casual conditions, which did not alter the results. (See Online Supplement C for the robustness analyses.)

***Buyer's Affective Processing.*** We measured the extent of affective processing (X-system) of the buying firm's boundary spanners during the response process on the basis of the words interviewees used to describe the QI. To do so, we used the text analysis software, Linguistic Inquiry and Word Count (LIWC) (Pennebaker et al., 2001), which analyzes texts by matching the words they contain with predefined dictionaries. LIWC calculates the percentage of words in the interview transcripts that represent a given psychological category (Tausczik & Pennebaker, 2010). For example, the words "happy," "cried," and "abandon" would all be counted as mentions of the concept of "affective processes." The LIWC category of "affective processes," which contains both positive and negative emotions, was used to evaluate the extent of affective processing during the response process. Previous studies in the management literature have used LIWC, for example, to analyze emotions in online dispute resolution (Brett et al., 2007) or deception in firms' sustainability reports (Crilly, Hansen & Zollo, 2016). The LIWC categories are internally reliable and externally valid (Tausczik & Pennebaker, 2010) and therefore are appropriate for research (Crilly et al., 2016). Experimental evidence also supports the validity of LIWC with respect to measuring affective processing in retrospective accounts of past events (Kahn, Tobin, Massey & Anderson, 2007). Drawing on the results from the LIWC analysis, we transformed the LIWC values of each case into fuzzy-set scores for the degree of membership in the *set of QIs with high affective processing*. We used the sample mean of the LIWC measure to set the crossover point at 3.5. Based on the observed standard deviation, the threshold for full membership was set at values of 5.0 and the threshold for nonmembership at values of 2.0.

***Buyer's Rational Processing.*** We assessed the extent of rational processing (C-system) of the buying firm's boundary spanners using the LIWC category of "cognitive processes." This category computes the percentage of words in the transcripts that are related to reasoning or "cold" cognitive mechanisms (Yin, Mitra & Zhang, 2016). For example, the words "why," "because," and "understanding" would all be counted as mentions of the concept of "cognitive processes." We

then used the results from the LIWC analysis to calibrate each firm's degree of membership in *the set of QIs with high rational processing*. Our calibration thresholds for this fuzzy-set followed the same logic used in calibrating the affective processing (fully in ≥17.0; crossover = 13.0; fully out <9).

### Configurational Analysis

The next step after calibration of set membership involved the construction and refinement of the so-called truth table, which displays all logically possible combinations of the eight causal conditions. We set a frequency threshold of one and deleted any configuration that was not associated with one of the 60 QIs. We then specified a consistency threshold to select the configurations reliably associated with one of the outcomes—either buyer–supplier conflict or constructive interaction. Consistency refers to "the degree to which the cases sharing a given combination of [causal] conditions agree in displaying the outcome in question" (Ragin, 2008, p. 44). We adopted a minimum raw consistency of ≥.80 and eliminated any configurations that had a proportional reduction in inconsistency (PRI) value of <.75 (Ragin, 2008; see also Vergne & Depeyre, 2016, p. 1663).

The final step involved two analyses: We first conducted necessity analyses of all causal conditions and their negation, applying a recommended consistency threshold of .90 (Ragin, 2008; see also Vergne & Depeyre, 2016, p. 1663). We then conducted sufficiency analyses using Ragin's (2008) truth table algorithm to identify configurations associated with conflict or constructive interaction. The fsQCA software (version 2.5, Ragin & Davey, 2009) ran all these calculations.

In the next section, we report a combination of the parsimonious solution (core conditions only) and the intermediate solution (both core and peripheral conditions), following current conventions (Greckhamer, 2016). The core conditions are the causal conditions for which the data indicate a strong relationship with the outcome, whereas peripheral conditions are those for which the evidence for a relationship with the outcome is weaker (Fiss, 2011).

## RESULTS

The configuration table (Table 5) displays the results from the fuzzy-set analysis; each column represents a distinct configuration. This table presents both the archetypes (i.e., configurations characterized by the same core conditions) that feature in the parsimonious solution and the more detailed configurations (i.e., variants of these archetypes that differ in their peripheral conditions) that show in the intermediate solution.

Table 5 also reports two measures of fit: consistency and coverage. The *consistency* score gauges how well the solution corresponds to the data and is calculated for the overall solutions, as well as for each configuration (Ragin, 2008). The overall solutions exhibit very good set-theoretic consistency—the scores of .91 (conflict) and .90 (constructive interaction) clearly exceed the recommended consistency threshold of .80 (Fiss, 2011; Misangyi & Acharya, 2014).

Overall solution *coverage* measures the empirical relevance of the solution as a whole and is comparable to an R-square statistic in regression analysis (Ragin, 2008). The four configurations associated with conflict account for about 56 percent of the QIs that resulted in conflict, whereas the three configurations associated with constructive interaction cover 59 percent of the QIs that resulted in constructive interaction. These values indicate substantial solution coverage (Chari, Tarkiainen & Salojärvi, 2016). For each individual configuration, the consistency, raw, and unique coverage measures are reported in Table 5. Raw coverage takes into account the overlap among cases, and unique coverage shows the relative importance of each configuration (Fiss, 2011).

### Configurations for Conflict

Our necessity analysis shows that none of the causal conditions is necessary for conflict—that is, no causal condition is shared by almost all (consistency threshold of .90) QIs that lead to conflict. The sufficiency analysis reveals two archetypes associated with conflict in response to supplier-induced disruptions. In general, the results support the suggestion that individual- and organizational-level factors combine in complex ways to shape the response processes and their outcomes.

***"Suspicious Firefighters" (Configurations C1a, C1b).*** The first archetype features the absence of strong relational governance mechanisms, as well as the absence of recovery actions from the supplier side and a lack of rational processing at the buyer side. The QI "interior equipment" (Q08), which involved a range of quality problems in the automotive interior parts supplied to WheelCo A by one of its indigenous Chinese suppliers, illustrates this pattern leading to conflict. In this case, the buyer–supplier relationship was characterized by mutual distrust because the supplier was at the same time a key competitor in the Chinese market:

> We are always the main competitor bidding for OEM customers, fighting everywhere for different projects. High-level, low-level, everywhere. [...] They don't trust WheelCo A, and WheelCo A is not trusting our competitor either. (X3, SQE, WheelCo A)

TABLE 5

Configurations of Causal Conditions Leading to Conflict/Constructive Interaction in BSRs

| | Conflict | | | | Constructive Interaction | | |
|---|---|---|---|---|---|---|---|
| Outcome Archetype | Suspicious Firefighters | | In Deadlock | | Working as a Team | Benevolent Leader | On Autopilot |
| Configuration | C1a | C1b | C2a | C2b | NC1 | NC2 | NC3 |
| Organizational level | | | | | | | |
| High disruption severity | | ● | | ● | ⊗ | | ⊗ |
| Relational governance | ⊗ | ⊗ | ⊗ | ⊗ | ● | ● | ● |
| Buyer dominance | | | ⊗ | ⊗ | | ● | |
| Buyer buffering actions | ⊗ | ● | ⊗ | ● | ⊗ | ⊗ | |
| Buyer bridging actions | ● | ● | ● | ⊗ | | ● | ⊗ |
| Supplier recovery actions | ⊗ | ⊗ | ⊗ | ⊗ | ● | ● | ● |
| Individual level | | | | | | | |
| Buyer's affective processing | ● | | ⊗ | ● | | ● | ⊗ |
| Buyer's rational processing | ⊗ | ⊗ | ● | ● | | ● | ⊗ |
| Consistency | .89 | .89 | .95 | .88 | .91 | .88 | .92 |
| Raw coverage | .18 | .38 | .21 | .16 | .48 | .32 | .23 |
| Unique coverage | .03 | .19 | .08 | .06 | .14 | .06 | .05 |
| Overall solution consistency | .91 | | | | .90 | | |
| Overall solution coverage | .56 | | | | .59 | | |

●, core causal condition (present); ●, core causal condition (absent); ⊗, peripheral causal condition (present); ⊗, peripheral causal condition (absent).

When quality problems with the supplied metal parts occurred, the supplier rejected WheelCo A's attempts to provide technical support. As WheelCo A's Head of Supplier Quality Development (SQD) (X1) stated:

> The supplier was not willing to work on the problems together, but instead had a completely defensive attitude. [. . .] Every time, the offer was rejected right away. You cannot do more than offer it. To prevent unnecessary discussions about covering costs for the high scrap rate, we suggested working on the issue together. The response we got was simply the blockade mentality. (X1, Head of Supplier Quality Development (SQD), WheelCo A)

Looking back on the QI, WheelCo A's SQMs noticed shortcomings related to rational and analytical procedures, which might be indicative of the absence of rational processing that features in this archetype. As the following quotes illustrate, analytical procedures such as the project reviews should have been conducted with greater care:

> A lesson learned from this quality incident is maybe that the project reviews throughout the whole project did not happen as thoroughly as they should actually have. If we would have done so, we would probably have noticed that no common basis [for an error catalogue] existed. This is not a question of the frequency, but of the content-related quality of the reviews. (X1, Head of SQD, WheelCo A)

> If we are facing this situation again, we would need to consider the situation from the supplier's side. [. . .] We would need to change our position and see not only the customer side but also the supplier side. (X3, SQE, WheelCo A)

The two configurations subsumed under this archetype share the three core conditions described, but they differ in their peripheral conditions. In configuration C1a, the absence of buyers' rational processing co-occurs with the presence of affective processing. For example, the atmosphere during the response process of the QI "steel making components" (Q59) was described as "quite tense," suggesting that *negative* emotions feature strongly in this configuration. Although buying firms in configuration C1b initiate bridging actions, such as technical assistance or top management meetings with the respective supplier, these bridging actions might prove ineffective, given the supplier's uncooperative posture. Instead, the buying firm might resort to less cooperative buffering actions. A closer look at the QI "lock holder" (Q11), which resulted from unauthorized process changes at the supplier site, suggests how buffering actions can contribute to the escalation of conflict in severe QIs. WheelCo B realized that the present supplier "could not and did not want to resolve the problems" (X6, Strategic Purchaser, WheelCo B), and it therefore ramped up an alternative supplier. Although this buffering action secured supply in the short term, it further contributed to the escalation of the conflict with the present supplier:

> The supplier let the problem escalate relatively quickly; at some point he noticed that we were going to charge him a lot of costs, and he probably also suspected that we were establishing a new supplier in the meantime. Eventually, the supplier held a gun to our head and said, "I want a 30% price increase now; otherwise I will stop delivery right away." (X6, Strategic Purchaser, WheelCo B)

***"In Deadlock" (Configurations C2a, C2b).*** The second archetype associated with conflict includes buyer–supplier relationships in which strong relational governance mechanisms and buyer dominance are lacking, and recovery actions from the supplier side are absent. For example, the QI "emulsifier" (Q22), in which changes in the supplier's emulsifier reduced the dispersion performance of ChemCo A's chemicals, illustrates how the absence of buyer dominance might reduce the supplier's willingness to undertake recovery efforts and thus lead to conflict. The Chinese chemicals supplier had a relatively strong power position in relation to ChemCo A because ChemCo A accounted for only a small share of the supplier's sales and because government approval procedures for the chemicals made supplier changes in the short term difficult.

> Sometimes purchasing can put some pressure on the supplier by threatening to reduce future orders. We think that the supplier didn't care, though, because they did not make any improvements. [. . .] Although they promised to adjust the recipe to try to meet our requirements, they didn't follow through with their actions. (Quality Manager, X43, ChemCo A)

Confronted with this difficult situation, the buyer needed to devote more analytical attention to the response process, which might explain the presence of rational processing as a peripheral condition in both configurations of this archetype. ChemCo A's Quality Manager (X43) stated that its Chinese suppliers usually are very cooperative, "but for this case you have to pay more attention to think about how to communicate with the supplier" (Quality Manager, X43, ChemCo A).

The peripheral conditions in configuration C2b, to which the QI "emulsifier" (Q22) belongs, show that

high incident severity co-occurs with high affective processing. As the following quote indicates, the buyer was really anxious, given the critical nature of the quality problem and the supplier's uncooperative posture.

> It is really a big problem for us. How to solve this problem is a challenge for us because the supplier does not care about our complaint, but our production has to continue. (Quality Manager, X43, ChemCo A)

This anxiety indicates high affective processing and might be closely linked with a more analytical problem-solving in configuration C2b. Moreover, this analytical problem-solving is reflected in the type of buffering actions that the buying firm undertakes in configuration C2b, which in the emulsifier incident meant developing a workaround for the chemical's dispersion problem.

> We had found a solution, but the problem was that our tank containing the emulsifier is very big. It is very difficult and time-consuming to homogenize the material, so it affects our efficiency and flexibility. (Quality Manager, X43, ChemCo A)

### Configurations for Constructive Interaction

We performed a second analysis to uncover necessary and sufficient conditions associated with constructive interaction. Our analysis for necessary conditions identified the presence of supplier recovery actions as a necessary but not sufficient condition for constructive interaction. In our data, supplier recovery actions are almost always present (consistency score of .95) when responses to supplier-induced disruptions involve constructive interaction, which is not surprising considering the mutual dependence in *inter*actions during disruption response processes. Although supplier recovery actions are a necessary ingredient for constructive interactions, our sufficiency analysis shows that they are not sufficient—other buyer-related causal conditions are critical. Our sufficiency analysis reveals three archetypes associated with constructive interaction.

***"Working as a Team" (Configuration NC1).*** The first archetype reflects less-severe QIs that occur in buyer–supplier relationships in which strong relational governance is present, in combination with supplier-side recovery actions and a lack of buyer-side buffering actions during the response process. For example, the QI "powder coating" (Q03), which ConnectCo B encountered in the plating process of metal parts during the sample phase, depicts how relational governance—and in particular, an attitude to work toward mutual goals—interplays with supplier-side recovery activities. ConnectCo B's Purchasing Manager (X34) recounted his conversation with the plating supplier at the initial stage of the response process:

> I said: "We have a challenging problem. Do you want to settle this problem or do you want to give up?" But they do not want to give up. [. . .] If we settle the problem, they get the business. It is not always a sample—we *will* get to mass production, so they can earn significant money. So this is a win-win business. (Purchasing Manager, X34, ConnectCo B)

During the subsequent response process, the plating supplier actively worked together with ConnectCo B and its powder coating subsupplier to develop a technical solution that would achieve the required quality. Cooperation from the supplier side appears to be a decisive factor:

> By communicating with the supplier and sub-suppliers, we found the solution. It is not found by me; it is found together during the communication (Purchasing Manager, X34, ConnectCo B)

Strong, overarching relational governance appears to positively influence the supplier's willingness to undertake recovery actions when less severe QIs occur, and it might in turn reduce the need for buyer-side bridging actions in this archetype. Consider the QI "engine piston" (Q19), in which VehicleCo noticed porosity problems during sample testing of the supplied automotive part. The following quote from VehicleCo's SQM (X38) illustrates the link between relational governance and supplier-side recovery actions:

> You should work like a team for the common goals; this teamwork will lead to a win-win situation. [. . .] The supplier will finally understand your point and be willing to move ahead, but it is very important to build up trust and show your leadership. I think the trust cannot be developed in one minute; it is a process, a time-consuming task. (SQM, X38, VehicleCo)

***"Benevolent Leader" (Configuration NC2).*** The second archetype associated with constructive interaction also involves strong relational governance in combination with supplier-side recovery actions, but it differs from the other archetypes in the presence of buyer dominance. Consider the QI "hairdressing chair" (Q29), in which HairCo was confronted with repeated customer complaints about a hairdressing chair supplied by its Chinese supplier. Although HairCo was one of the supplier's top customers and in a relatively strong power position in relation to the supplier, it deliberately did not exercise its buying power. As the Head of Purchasing (X51) explained:

> Refunding the purchase price is not the big issue; the main problem is the high consequential costs incurred. Eventually we only asked the supplier to replace the defective parts because we want to continue cooperating with the supplier in the future. If we charged unreasonably high claim costs, at some point the supplier would not play along anymore. (Head of Purchasing, X51, HairCo)

Instead of confronting the supplier with high claim costs, HairCo chose to solve the quality problem together with the supplier, thus prioritizing the maintenance of a good relationship over the monetary compensation. The "joint problem-solving attitude" on both sides was viewed as an enabler for successfully solving the quality problems by the supplier's Sales Manager (X54).

In addition, this configuration features both affective and rational processing at the buyer as peripheral conditions. The atmosphere during the response processes was described as "very harmonious" (Q29), "very positive" (Q21), and "very good" (Q01), suggesting that the affective processing in these cases featured *positive* emotions. Moreover, the high degree of buyer-side cognitive involvement might reflect higher managerial attention to these QIs. The following quote from HairCo's Head of Purchasing (X51) illustrates how the buying firm's alertness to QIs might trigger rational processing:

> If the first chair is returned with a defect, there is a high likelihood that the same problem happens again during manufacturing. Therefore, as soon as we detect something, we must be very careful and increase everybody's awareness. We need to investigate the problem right away and approach the supplier, instead of treating it as only a special case. (Head of Purchasing, X51, HairCo)

***"On Autopilot" (Configuration NC3).*** The final archetype associated with constructive interaction involves buyer–supplier relationships with strong relational governance, the absence of buyer-side bridging actions, and the absence of affective processing at the buyer. The less severe QIs in this archetype are solved on "autopilot"; they necessitate neither cognitive involvement nor bridging actions on the buyer-side. The QI "missing gasket" (Q10), in which WheelCo A noticed during the assembly process that a gasket was missing in a supplied interior automotive part, illustrates this pattern. The SQE (X3) recollected the smooth response process:

> The supplier's quality engineer received the e-mail and saw the pictures: One is of a good part, the other is of a bad part. So the quality engineer said "Yes, it is our problem." So he comes to our site in about two hours. [. . .] Our supplier sorted the suspended parts and found that only two parts have the problems. [. . .] It is a simple case. They are very cooperative with the WheelCo A team. (SQE, X3, WheelCo A)

## DISCUSSION AND IMPLICATIONS

The purpose of this study was to understand which combinations of multilevel factors contribute to whether supplier-induced disruptions result in buyer–supplier conflict or in constructive interaction. Employing the fsQCA methodology, we conducted a detailed analysis of how cognitive, behavioral, and structural factors combine in complex ways to shape responses to supplier-induced disruptions and to affect their outcome. Our results identify two archetypes associated with conflict and three archetypes associated with constructive interaction.

### Toward Middle-Range Theory for Responses to Supplier-Induced Disruptions

Our first contribution to the literature is the development of *middle-range theory* (Craighead et al., 2016) for responses to supplier-induced disruptions, building on the *theoretical foundation of EST*. Overall, our findings support the view in the extant literature that relational governance is vital in governing supply chain partnerships in emerging markets (Zhou & Xu, 2012) and that the supplier-side recovery actions critically influence the buyer's evaluation of the response process (Liao, 2007; Wang et al., 2014). Yet, our findings go beyond the existing literature in that they demonstrate that a single, generalizable pathway to conflict or constructive interaction cannot be identified. Instead, multiple alternative configurations of cognitive, behavioral, and structural factors can lead to each outcome. Because our conceptual framework accounts simultaneously for the interplay among these factors across different levels of analysis, the identified archetypes provide more nuanced yet still parsimonious insights into the conditions under which disruption response processes result in conflict or constructive interaction.

Buying firms appear to use buffering and bridging as alternative responses in the identified configurations because the presence of bridging generally co-occurs with the absence of buffering (or vice versa). This finding supports the notion that firms regard buffering and bridging as alternative response actions (Bode et al., 2011), yet it extends the extant literature by showing that the effectiveness of buffering and bridging actions is contingent upon other factors. In particular, bridging actions in combination with strong relational governance and supplier-side recovery

actions are associated with constructive interaction in configuration NC2, whereas bridging actions are associated with conflict if they are not accompanied by these two factors in configurations C1a, C1b, and C2a. Buffering actions, in turn, are associated with conflict if relational governance and supplier-side recovery activities are absent in severe QIs (configurations C1b and C2b). The opposite situation can be observed for less-severe QIs (configuration NC1), which indicates that buying firms might apply buffering actions as "emergency breaks" in their contingency plans. These patterns indicate a situation of complex causation (Ragin, 2008), where multiple factors combine to produce outcomes.

Further, while prior research found that asymmetric relationships are more likely to result in conflict than symmetric relationships are (Lumineau & Malhotra, 2011), our findings suggest that, in the setting of our study, power symmetry is associated with conflict and buyer dominance is associated with constructive interaction. These findings show that the commonly accepted tenet that power symmetry results in more cooperative interactions needs to be qualified as context dependent. A conceivable explanation is the cultural dimension of power distance (Barkema, Chen, George, Luo & Tsui, 2015): In contexts characterized by high power distance, such as China, people accept that power is unequally distributed, and the less powerful supply chain partner therefore accepts its weaker position (Zhao, Flynn & Roth, 2006; Zhao, Huo, Flynn & Yeung, 2008). However, the configuration *benevolent leader* (NC2) shows that buyer dominance is associated with constructive interaction particularly in combination with cooperative bridging actions. This result might be explained using the concept of paternalistic leadership (Pellegrini & Scandura, 2008), which is rooted in Confucian thought and expects the more powerful party to act in a benevolent way toward the weaker party in exchange for the weaker party's obedience and loyalty. In the Chinese context, power asymmetry thus might contribute to harmonious relationships as long as the buying firm does not exploit its power position.

### Cognitive Microfoundations of Responses to Supplier-Induced Disruptions

Our second contribution is to the *behavioral supply management* literature (Carter et al., 2007), and in particular to the cognitive microfoundations of supply management (Kaufmann et al., 2014; Stanczyk et al., 2015). We extend prior research that characterizes disruption response processes based on buying firms' actual behavior (e.g., Bode et al., 2014) by shedding light on the role of managerial cognition in disruption response processes: Our results show that cognitive processes feature as sufficient conditions in every configuration associated with conflict or constructive interaction except for one (NC1). This finding suggests that cognitive processes are crucial microfoundations for explaining heterogeneity in organization-level supply chain disruption management, thus adding empirical evidence to a growing stream of literature on managerial cognition in the general management (Helfat & Peteraf, 2015; Maitland & Sammartino, 2015) and SCM literature (Kaufmann et al., 2014; Stanczyk et al., 2015). Our research on the cognitive microfoundations of responses to supplier-induced disruptions complements prior studies that investigate the social and psychological implications of supply chain disruptions, such as perceptions of justice (e.g., Wang et al., 2014) and psychological contract breaches (e.g., Eckerd et al., 2016).

Moreover, our study extends recent behavioral research on decision-making in the purchasing function that examines the interplay between affective and rational processing (Kaufmann et al., 2017; Stanczyk et al., 2015). Although these prior studies find mixed evidence in seeking to explain the relationship between affective and rational processing, our study points to situational factors as mediators that might explain why emotions hinder "cold" cognition in some cases and stimulate rational processing in other cases: In line with the reflection–reflexion model (Healey et al., 2015; Lieberman, 2007), our results show that affective processing and rational processing contribute to the outcome jointly in configurations C2b and NC2, but they do so independently in configurations C1a (only affective processing) and C2a (only rational processing). A potential explanation for this pattern is that uncooperative behavior from the supplier might trigger negative emotions that create an attention stimulus for purchasing managers to process information in a more analytic and vigilant manner if QIs are severe (C2b) but that hinder rational processing in less-severe incidents (C1a) (Elfenbein, 2007). In contrast, cooperative behavior from the supplier might trigger positive emotions, which can stimulate rational processing that allows for a broader and more complex focus on problem-solving (Elfenbein, 2007). Therefore, our configurational analysis of polar cases suggests that future research might yield more consistent findings by accounting for the differential effects of positive and negative types of affective processing.

Methodologically, our study introduces LIWC—a cognitive-linguistic approach maintaining that subtle differences in language reflect differences in cognition (Crilly et al., 2016)—to the SCM literature. This methodology seeks to overcome "the difficulties of capturing, representing and interpreting unobservable structures and processes, as unobtrusively and time-sensitively as possible" (Maitland & Sammartino,

2015, p. 8). Using LIWC allowed us in a qualitative study to design robust measures of purchasing managers' affective and rational processing during responses to supplier-induced disruptions, and it might prove to be a useful tool for the complicated study of managerial cognition in SCM.

### Managerial Implications

Our study holds important managerial implications. The insights gained from the fsQCA draw attention to managers' cognitive processing during responses to supplier-induced disruptions and can support practitioners in shifting gears if the cognitive mode does not align with the needs of the disruption situation at hand. Buying firm managers in the *"suspicious firefighters"* archetype should become aware of their low rational processing in combination with a bias toward hands-on bridging and buffering actions. In such situations, managers might benefit from increasing their rational processing to reconsider whether they could take a different route for the disruption response. Methods to increase rational processing include analytical techniques, such as failure mode and effect analysis (FMEA) or Ishikawa diagrams. In contrast, firms in the *"benevolent leader"* archetype might choose to shift to *"on autopilot"* if strong relational governance and recovery actions by the supplier are present, thus freeing up managerial attention that might be more urgently needed elsewhere.

In the context of sourcing from emerging market suppliers, our findings further suggest that purchasing managers are well advised to invest in relational governance to safeguard against supplier-induced disruptions' erupting into conflict. Particularly if the buyer holds a dominant power position, paying heightened attention to the resolution process and complementing relational governance with bridging actions might be helpful. However, in disruption response processes where the supplier displays an uncooperative attitude, the buying firm should pull the emergency break and initiate buffering actions early on, rather than falling prey to the "commitment bias" (Carter et al., 2007) and continuing to invest in bridging actions. According to our findings, the chance of creating a constructive relationship through bridging seems rather low under these circumstances.

Further, our findings indicate that disruption response processes are not associated with conflict if the buyer is clearly the more powerful party—a particularly interesting result, given that balanced relationships have been found to be less conflict-laden in contexts other than emerging market sourcing. Based on our findings, purchasing managers might be well advised to structure their supplier portfolios in emerging markets in a way that puts them into superior power positions. At the same time, using this power as a basis for a clearly directional, but generally benevolent, "paternalistic" style of supplier management, seems more effective than aggressively exploiting it.

Finally, we can advise managers at supplying firms to undertake recovery actions proactively if they seek to avoid conflict with the buying firm. Especially in Asia, indigenous suppliers might have a cultural tendency to seek harmony in relations and consequently might hesitate to address problems directly (Barkema et al., 2015). However, our results indicate that recovery behavior in which the supplier is "trying to sit out the problem" is associated with conflict across all configurations, while supplier-side recovery actions are a necessary condition for constructive interaction with Western buying firms.

## LIMITATIONS AND FUTURE RESEARCH

This study has some limitations. First, our findings can be classified as middle-range theory (Craighead et al., 2016) and thus can be expected to exhibit high accuracy for the specific context of supplier-induced disruptions in relationships between Western buying firms and Chinese suppliers. However, the question of whether our insights can be generalized from our empirical setting to similar contexts (Flyvbjerg, 2006) is subject to future empirical research that explores the boundary conditions (Busse, Kach et al., 2016; Busse, Schleper et al., 2016) of our middle-range theory. In particular, future research might investigate whether a paternalistic leadership style can be effective in situations characterized by high-power asymmetry outside the Asian institutional context.

Second, although we sought to generate a well-rounded picture by collecting observational and interview data for the selected suppliers, our data capture the interactions mainly from the buying firm's perspective. A purely dyadic study might yield more insights into the interorganizational aspects of managerial cognition in buyer–supplier relationships. Going forward, researchers could adapt and extend the rich body of knowledge on shared cognition in teams (Healey et al., 2015) to the interorganizational SCM context.

Third, our cross-sectional research design and the fsQCA methodology do not establish causal links with certainty, nor can they rule out any potential reverse causality among the relationships (Misangyi & Acharya, 2014). We would encourage future research to specifically test for causality—for example, through process field experiments (Chatterji, Findley, Jensen, Meier & Nielson, 2016).

A final limitation pertains to our cross-sectional, retrospective data collection strategy. Despite our efforts to guard against retrospective bias (i.e., relying on

**TABLE 6**

**Supply Chain Disruptions and Service Recovery—A Research Agenda**

| | What? Area to Investigate | Who? Actors | Where? Contextual Variables | When? Temporal Variables | Why? Relevance | How? Managerial Interventions |
|---|---|---|---|---|---|---|
| Key concepts | Topic area: cognitive, psychological, social, behavioral, and structural factors influencing supply chain disruptions, service recovery processes, and their consequences<br>Situational factors: type of disruption; type of purchase item; supply disruption situation | Individual-level: personality traits, cognitive orientation, cultural background<br>Team-level: team roles, shared cognition<br>Organizational-level: power asymmetry, relationship type (arm's length vs. arms-linked), interorganizational trust | Contextual factors: institutional environment, national culture, environmental dynamism, supply network structure, industry sector (e.g., profit vs. nonprofit), corporate culture, ownership type (private vs. state-owned) | Temporal factors: relationship life-cycle stage, time criticality of supply disruption, timing of intervention (early vs. late) | Why is it important to investigate this area? What are the outcomes and consequences of supply chain disruptions and service recovery? | Measures to prevent supply chain disruptions from resulting in conflict and to foster constructive interaction |
| Possible research questions | • Do different archetypes of response processes lead to different types of conflicts (i.e., relationship, task, and process conflict)?<br>• Which factors determine why disruption response processes follow certain archetypes?<br>• How do different types of buyer-side responses interplay with different types of supplier-side responses during disruption response processes? | • How do positive and negative emotions affect disruption response processes?<br>• How do personality traits of boundary spanners influence whether supplier-induced disruptions result in conflict?<br>• How do different functional-level "thought worlds" or "dominant logics" influence cross-functional coordination during disruption response processes? | • How does national or corporate culture or functional thought worlds moderate the interplay among cognitive, behavioral, and structural factors?<br>• Are supply disruptions more or less likely to lead to conflict in environments characterized by institutional voids?<br>• Are some of the archetypes more effective in certain contexts? | • How do the effects of supply disruptions spread across different tiers in supply chains over time?<br>• How does a supplier's service recovery system evolve over time?<br>• How do complex supply networks adapt to supply disruptions?<br>• Which stages and patterns of supply disruption responses exist? | • What are the operational, financial, and strategic performance outcomes of supply chain disruptions?<br>• What are the short-term and long-term effects of "failed" disruption response processes on the buyer–supplier relationship?<br>• How do different levels of service recovery | • How can buying firms structure incentive systems to encourage constructive interaction during disruption response processes?<br>• How can suppliers implement a service recovery system that maximizes recovery performance? |

(continued)

**TABLE 6** (continued)

| | What? Area to Investigate | Who? Actors | Where? Contextual Variables | When? Temporal Variables | Why? Relevance | How? Managerial Interventions |
|---|---|---|---|---|---|---|
| | • Do disruption response processes play out differently depending on the type of disruption (e.g., material vs. financial vs. information flow disruption)?<br>• Do disruption response processes play out differently for different supply disruption situations (e.g., supplier-induced vs. buyer-induced vs. force majeure, isolated vs. widespread)? | • How do similarity and dissimilarity in the cognitive processing of boundary spanners affect coordination across firm boundaries? | • What is the effect of different supply network structures on supply disruption responses? | • Do responses to disruptions and their consequences depend on previous events in the supply chain relationship (path dependency)?<br>• How does managerial cognition and attention affect the speed with which companies react to supply disruptions? | performance influence purchasing managers' justice perceptions and service recovery evaluations?<br>• What is the "bright side" of supply chain disruptions?<br>• How do supply chain disruptions affect competitive dynamics in supply chains? | • Which supply chain practices (e.g., contingency plans) reduce the probability that supply chain disruptions result in conflict?<br>• What effect do training programs have on managerial cognition? |
| Promising theories | Attribution theory, expectancy theory, justice theory | Dual-process theories, schema theory, social exchange theory | Complex adaptive systems theory, contingency theory, institutional theory | Complex adaptive systems theory, dynamic capabilities, event system theory, organizational inertia | Affective events theory, competitive dynamics theory, supply chain practice view | Psychological contracts, supply chain practice view |
| Suggested methodologies | Survey research, multiple case studies | Linguistic Inquiry and Word Count (LIWC), experiments | Survey research, mixed-methods research | Process studies, simulations | Event studies, laboratory experiments, big data analytics | Field experiments, action research |
| Examples of studies that have started to explore these issues | Bode et al. (2011, 2014); Wang et al. (2014) | Healey et al. (2015); Kaufmann & Wagner (2017) | Eckerd et al. (2016) | Bode & MacDonald (2016); Nair et al. (2016) | Hendricks & Singhal (2005a,b); Wang et al. (2014) | Carter, Kosmol & Kaufmann (2017); Eckerd et al. (2013); Smith et al. (2009) |

multiple informants, recollection of concrete events, within the previous 18 months), our data collection technique likely does restrict to some degree our ability to obtain a deeper understanding of the dynamic processes at play. We therefore point to real-time, longitudinal research as a promising data collection strategy.

Based on the above discussion of our research and its implications, we suggest several directions for future research. Table 6 uses the "5Ws and H" approach (Cao & Lumineau, 2015) to outline a comprehensive agenda for future research on responses to supply chain disruptions. The table is structured along six nonmutually exclusive questions. More broadly speaking, we encourage scholars to build on the event-oriented approach to supplier-induced disruptions developed in this paper, which shifts attention to the often neglected dynamic processes (Langley et al., 2013; Morgeson et al., 2015). We believe that SCM research would benefit from adopting event-oriented approaches to expand our understanding of the effects of events beyond the domain of supply chain disruptions. Event-oriented SCM research can help to explain how events such as the introduction of a new technology (e.g., 3D-printing) or the hiring of a new chief procurement officer affect SCM organizations and supply chains over time and across levels.

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## SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

**Appendix S1.** Semi-Structured Interview Guideline.
**Appendix S2.** Overview of Quality Incidents.
**Appendix S3.** Supplementary FSQCA Analyses.