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# Organizational resilience and interorganizational relationships: An exploration of Chinese business service firms

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## Abstract

Much research on organizational resilience has focused on the intraorganizational capacity that enables positive adjustment to disruption. Yet, when seen as open systems, organizations are highly interdependent and interconnected with many other actors. This raises the question of how interorganizational relationships (IORs) affect organizational resilience. We explore this using a novel inductive two-stage approach incorporating fuzzy cognitive mapping to identify the relational determinants of organizational resilience in the context of Chinese business service firms. Using this technique reveals five relational dimensions, which we label *relational competence*, *innovative assimilation*, *integrative trustworthiness*, *identity constraints*, and *asymmetry*. The analysis also shows how these interrelate to either positively or negatively affect organizational resilience. This is a new way of understanding organizational resilience and shows how it is determined by a complex interplay between IOR attributes in the external relational environment of the organization.

## KEYWORDS

Chinese business services, fuzzy cognitive mapping, interorganizational relationships, organizational resilience

## INTRODUCTION

Resilience has been increasingly acknowledged as an important capability for an organization to “react to and recover from duress or disturbances with minimal effects on stability and functioning” (Williams et al., 2017, p. 740) and to survive over the long term (Bhamra et al., 2011; Ortiz-de-Mandojana & Bansal, 2016). Broadly speaking, resilience manifests itself in “bouncing back” for survival, such as positively adjusting and absorbing strain in the face of adversity (e.g., Bunderson & Sutcliffe, 2002; Sutcliffe & Vogus, 2003; Limnios et al., 2014), and in “bouncing forward” for striving, including innovating with new business models in order to adapt over the longer term (e.g., Hamel & Valikangas, 2003).

Although it might be tempting to think that either form of resilience can be achieved by an organization on its own,<sup>1</sup> notable works touch on the importance of relational connections within and outside of the organization

in fostering resilience (Barton & Kahn, 2019; Lengnick-Hall et al., 2011; Weick & Roberts, 1993; Williams et al., 2017). As Christianson et al. (2009) stated, resilience is a social process in which actors recognize how their actions are entrained into a larger pattern of shared action. Barton and Kahn (2019) argued that resilience is enacted “through coordinative practices that allow members to mindfully engage with one another, drawing on collective resources in crafting adaptive responses” (p. 1410). Powley (2009, p. 1294) suggested that resilience is “a latent capacity in organizations - built over time through social interaction and relationships.”

Nevertheless, much prior work on resilience has neglected or downplayed the relational angle. As Barton and Kahn (2019, p. 1410) stated, previous studies on resilience “almost entirely build on cognitive and behavioral views of organizing.” Recently, there has been a handful of studies on the concept of relational resilience, focusing on intraorganizational relationships (Barton & Kahn, 2019; Olekalns et al., 2020) and interorganizational collaborations in the context of supply chains (e.g., Christopher & Peck, 2004; Kamalahmadi &

<sup>1</sup>Reviews suggest the majority of resilience work in business and management studies have taken an internal perspective (Bhamra et al., 2011; Linnenluecke, 2017).

Parast, 2016). Such work, however, tends to have a rather narrow focus on a limited range of variables such as trust and information sharing (Kamalahmadi & Parast, 2016).

The downplaying of the external relational aspect of resilience is problematic. First, organizations are not self-sufficient; they have to exchange resources and information with other organizations not only to function but also to survive (Bourgeois, 1980; Evan, 1965; Katz & Kahn, 1971). As Lorenzoni and Ornati (1988, p. 41) stated, "... organizations do not survive as isolated and self-sufficient entities ... they are strongly tied to supportive quasi-infrastructureal collectives." Second, the interorganizational literature places a strong emphasis on how organizations form partnerships with other organizations in order to create value (Alberts et al., 2016; Barringer & Harrison, 2000; Oliver, 1990). Despite some recognition that external connections of the organizations can serve as coping strategies to forestall, forecast, or absorb uncertainty (Oliver, 1990), the extant literature seems to fail to address how these relationships help organizations in the face of adversity. Third, external relationships are complex and multifaceted, involving nontrivial managerial learning (Hibbert & Huxham, 2005). They are not simply driven by cooperation and competition (Majchrzak et al., 2015). Oliver (1990) identified various attributes of external relationships, arguing that the decision to form relationships with other organizations is based on multiple interactions of these attributes. Exactly how these different attributes of relationships influence resilience has not been identified in the interorganizational relationship (IOR) literature, nor the emerging resilience literature.

To address this deficit, we explore organizational resilience *explicitly* from the perspective of IORs. We conceptualize organizational resilience as both a process and an outcome, broadly defined as "the process by which an actor (i.e., individual, organization, or community) builds and uses its capability endowments to interact with the environment in a way that positively adjusts and maintains functioning prior to, during, and following adversity" (Williams et al., 2017, p. 742). Our theoretical development thus focuses on how relational mechanisms interplay in shaping organizational resilience.

Our empirical setting is the transition economy of China. Despite being a large and fertile context for business growth, firms operating in the Chinese business environment have great difficulty surviving. They have faced significant risks and uncertainties resulting from decades of economic and institutional reforms, such as legal ambiguity, governmental interference, and competitive forces (Burgers & Padgett, 2009). Additionally, China is known for the way in which formal and informal relationships (e.g., guanxi and contractual governance) interplay. Guanxi, in particular, can play a pivotal role when conducting business to secure favors through organizational relations and to manage environmental uncertainties (e.g., Park & Luo, 2001; Xin & Pearce, 1996). This creates a fascinating context for uncovering and understanding

how relational mechanisms shape organizational resilience in the face of persistent adversity.

We draw predominantly on qualitative interview data from seven Chinese business service firms to conduct an explorative study of IORs and resilience through a two-phase research design. In the first phase, we inductively derive attributes of IORs that explain the formation of external relationships for the sampled firms. We then employ the fuzzy cognitive mapping (FCM) technique (Özesmi & Özesmi, 2004) in a second phase to capture and interpret the mental models of executives in the sampled firms on how these IOR attributes impact the resilience of their firms. This is a novel approach to understanding determinants of organizational resilience, and it reveals a complex interplay among IOR attributes both at a second-order level and an aggregate level. At the aggregate level, we identify five dimensions that we label *relational competence*, *innovative assimilation*, *integrative trustworthiness*, *identity constraints*, and *asymmetry*. The analysis reveals that three of these have positive effects on organizational resilience, whereas two have negative effects. We also identify feedback effects between organizational resilience and IOR attributes.

Our study makes several contributions that intersect the organizational resilience and IOR works of literature. First, we contribute to the theory on IORs by identifying a broader range of IOR attributes that are not in prior IOR work (Gulati & Singh, 1998; Oliver, 1990). Our findings provide a deeper understanding of how various IOR attributes interact with each other in shaping organizational resilience, a very much unexplored issue (Linnenluecke, 2017; van der Vegt et al., 2015). Second, we contribute to emerging research on relational resilience (Barton & Kahn, 2019; Olekalns et al., 2020) by shifting attention from internal relationships to external relationships. Our work reveals how IORs can have both resilience-enhancing and resilience-depleting functions, which together shape organizational resilience. This dual role of IORs is uncovered by using the FCM technique in a participatory way with informants, thus allowing a deeper view of the relational structure between different IOR attributes and resilience than seen in prior work. Lastly, by moving attention away from sudden-onset events in traditional resilience studies to an environment of ongoing frequently occurring threats, our work highlights how certain IOR attributes can undermine an organization's ability to coordinate and act as a cohesive unit, making it more vulnerable. This is of particular importance in contributing to the policy debate on how to build resilience.

## THEORETICAL BACKGROUND

### Organizational resilience

The concept of resilience in the business and management literature emerged from the seminal work of Meyer

(1982), who studied organizational response to external threats. He concludes that organizations can either absorb the impact of an environmental jolt or adopt new practices through learning. These align with the notions of “bouncing back” and “bouncing forward” as later noted by Manyena et al. (2019). Focus shifted from external threats to internal organizational reliability with the development of Normal Accident Theory (NAT) (Perrow, 1984) and High-Reliability Organizing Theory (HROT) (Roberts, 1990; Weick, 1993). These present fundamentally different views of what the literature refers to as “accidents.” The former assumes that the accident is inevitable and should be considered a “normal” consequence of complex organizational systems, whereas in the latter, the accident can be prevented through a mindful process aimed at error-free performance. However, both theories focus on low-probability and high-consequence events, which only rarely occur in organizations (Kahn et al., 2018).

Consistent with this event-based tradition in resilience research, the sudden events of 9/11 had a profound impact on the field, shifting attention away from intra-organizational reliability to mechanisms and strategies for managing adversity emerging from unexpected situations occurring more frequently (Andersson et al., 2019; Linnenluecke, 2017; You, 2021). In organizations, adversity can manifest itself in many different forms, such as the breakdown of capital and information flow (You, 2021), creeping strain (Kahn et al., 2018), and anxiety (Barton & Kahn, 2019). Resilience is seen as “a desirable characteristic” for an organization to possess (Linnenluecke, 2017), a way of managing these adversities (Williams et al., 2017). Resilient organizations have the ability to cope with adversity through flexible organizing (Sutcliffe & Vogus, 2003; Williams & You, 2022). Nevertheless, there is a wide variety of definitions of organizational resilience in the academic literature. Wildavsky (1988, p. 77), for instance, defined resilience as “the capacity to cope with unanticipated dangers as they become manifest, learning to bounce back.” By contrast, and in line with the notion of “bouncing forward,” Lengnick-Hall et al. (2011, p. 244) proposed resilience as “a firm’s ability to effectively absorb, develop a situation-specific response to, and ultimately engage in transformative activities to capitalize on disruptive surprises that potentially threaten organizational survival.”

A common thread is that resilience is an interactive process between an organization and its stakeholders. This interaction allows the organization to understand, respond to, and absorb adversity (Williams et al., 2017). As Kahn et al. (2018) stated, organizations are often threatened by “creeping” strain that places demands on organizational members’ strength, resources, and abilities. Such adverse situations can be intensified by exogenous triggers (e.g., regulation changes and changes in industry dynamics) and interorganizational-specific triggers (e.g., changes in partner composition and failure to

meet expected outcomes of relational dynamics) (Majchrzak et al., 2015). Consistent with prior works, we see resilience as “the process by which an actor (i.e., individual, organization, or community) builds and uses its capability endowments to interact with the environment in a way that positively adjusts and maintains functioning prior to, during, and following adversity” (Williams et al., 2017, p. 742).

## IORs and open systems

Within organization theory, organizations are conceptualized as open systems that acquire various inputs (materials, labor, capital, and information) from the environment and transform them into outputs that are exported to the environment in exchange for a new round of inputs (Bourgeois, 1980; Evan, 1965; Katz & Kahn, 1971). The open systems view stresses interdependence between an organization and its external environment. The latter constitutes a wide variety of social actors, including suppliers, regulatory groups, competitors, customers, and technology (Bourgeois, 1980). According to Oliver (1990, p. 241), IORs are different from the actual types of actors; they are “the relatively enduring transactions, flows, and linkages that occur among or between an organization and one or more organizations in its environment.” IORs involve actors working collaboratively across functional and geographical units at various levels to pursue shared tasks and goals (Alberts et al., 2016; Barringer & Harrison, 2000; Ireland et al., 2002). IORs exist in different forms, ranging from a dyadic to a network form with multiple relationships.

Prior research on IORs shows that the success of such relationships does not only depend on structural characteristics but is also driven by relational characteristics (e.g., Brattström & Faems, 2020). Extant research acknowledges the changing nature of these relational characteristics that shape relational dynamics, such as the degree of trust and commitment between partner organizations (e.g., Majchrzak et al., 2015; Zhong et al., 2017). Each relationship an organization has with another organization exhibits distinct attributes, such as stability, flexibility, and innovation (Shipilov et al., 2014). Oliver (1990) identified six relational attributes: necessity, asymmetry, reciprocity, efficiency, stability, and legitimacy, which affect interorganizational relational formation and contingency. Beyond changes within a single relational characteristic that can lead to either a positive or a negative spiral (Das & Teng, 2000), relational characteristics are assumed to interact with each other, serving as “coping strategies to forestall, forecast, or absorb uncertainty” (Oliver, 1990, p. 246). Although most studies have addressed the inherent heterogeneity and multiplicity of these interactions, focusing on either a positive valence (e.g., cooperation) or a negative valence (e.g., conflict or

competitive behavior), they rarely address the coexistence of the two valences, which are essential for understanding how IORs operate and ultimately attain specific outcomes (Lumineau and Oliveira, 2018). In the present paper, we address this by engaging in an inductive study of the complex nature of interorganizational relationships, with a particular focus on how interactions among various relational attributes influence organizational resilience.

## Organizational resilience and IORs: Uncharted territory

Literature has emerged at the intersection of organizational resilience and IORs, primarily focusing on the roles of interfirm trust and information sharing (Kamalahmadi & Parast, 2016). The concepts of dyadic trust and dyadic unity emphasize how mutual trust and relational coordination impact resilience (Olekals et al., 2020). Ponomarov (2012) found that a greater degree of mutual trusting behaviors can lead to greater resilience in buyer–supplier relationships. Cooperative relationships contribute to building trusted networks and enhancing resilience of supply chains (Wicher & Lenort, 2012). Shepherd and Williams (2014) found that trust and network relationships are paramount in achieving positive outcomes, especially in the face of adverse situations. Mandal (2012) pointed out that information sharing plays a vital role both before and after a disruption because collaboration can only occur when every member receives relevant information efficiently and effectively.

IORs, however, are complex strategic phenomena (Alberts et al., 2016; Barringer & Harrison, 2000; Hibbert & Huxham, 2005; Ireland et al., 2002). The decision to form relationships with other organizations is driven by various motives, not just trust and information sharing. As Brattström & Faems (2020) explained, each partner in an IOR exhibits its own interests, goals, culture, and practices and such between-partner differences influence relational dynamics between the partner organizations. Broader motives stem from resource scarcity, value expectancy, and coercive pressure (Schermerhorn, 1975). Alberts et al. (2016) identified three common sets of IORs: activity-based IORs (e.g., comarketing and R&D), partner characteristics-based IORs (e.g., industry affiliation), and structure-based IORs (e.g., governance structures). Oliver (1990) pointed out that the decision to enter an IOR is commonly based on complex interactions of several relational characteristics tied with unique resources. External connections provide a context in which resilience-related resources (e.g., cognitive, behavior, and emotional) can be activated (Williams et al., 2017) because they enable organizations to access broad resource networks for resilience development (Lengnick-Hall et al., 2011; Lengnick-

Hall & Beck, 2005). Seville et al. (2006) argued that resilience relates more to the softer, less tangible aspects of an organization, including effective communication and relationships within the organization and with key customers and stakeholders.

IORs are unstable in the sense that interorganizational collaborations can evolve over time (Majchrzak et al., 2015). Such relational dynamics are often described as reinforcing spirals, a change of IORs in either a positive or a negative direction (Brattström & Faems, 2020; Zhong et al., 2017). A positive spiral is characterized by cooperative action in pursuing common interests and benefits, whereas a negative spiral is characterized by competitive behavior and the pursuit of own interests at the expense of the other's (Das & Teng, 2000). The accumulation of negative spirals is likely to reduce willingness to commit to a relationship, leading to premature termination of an IOR (Ariño & De la Torre, 1998). The implication of this is that forming an IOR is not only a question of access to complementary resources for value creation and value capture in an initial rationale but also how the interactive nature of IORs can regenerate organizational resilience or “resilience potential,” an emerging theme in resilience research (Linnenluecke, 2017) that remains largely unexplored. Van der Vegt et al. (2015) specifically called for research on interorganizational coordination in order to advance understanding of how organizations deal with adverse events. Given the complex nature of IORs and the rather fragmented links established in the literature between IORs and resilience, we adopt an explorative approach with the following central research question: *how do IOR attributes inter-act and interrelate in order to influence organizational resilience?*

## METHOD

### Research context

We use the modern service industry (MSI) in China as the research setting. MSI has flourished in the last 20 years, accounting in 2018 for 51.6% of the Chinese GDP. The rapid development of MSI in China is driven by informatization, marketization, urbanization, and industrialization (Wang et al., 2017). With the fusion of the Internet and traditional industries, crossover services that promote cross-enterprise, -field, and -industry cooperation have become increasingly prevalent (Wu et al., 2016). There has also been large-scale inward FDI by international services organizations, particularly in financial services, property, trading, and business services, adding to uncertainty in the sector. China's MSI regional distribution features on one axis on the eastern coast, two belts in the north and south of China, and three clusters in the northeast, center, and west of China (Wu et al., 2016). These features add to a complex set of

challenges already facing Chinese business service firms, including deficiency in human resources (Wang et al., 2014), substantial regional variations in services growth across China (Wu, 2007), and the cultural embeddedness of services. This provides an ideal context in which to explore how IORs influence organizational resilience.

## FCM

Cognitive mapping is a useful tool to investigate a wide range of organizational phenomena through actors' mental representations (Eden et al., 1992). Soft knowledge, in which there is a high degree of complexity, can be captured graphically (Olazabal & Pascual, 2016). The fuzzy causal function is a nonlinear function that transforms the weight of causes from concept A to concept B into a positive or negative value between  $[-1,1]$  (Jetter & Kok, 2014; Özesmi & Özesmi, 2004). The FCM approach has been used in the study of resilience across different disciplines, such as social-ecological resilience (Gray et al., 2015), urban resilience (Olazabal & Pascual, 2016), and small business resilience (Williams et al., 2020).

Özesmi & Özesmi (2004) noted that FCM is useful for theory development in situations that are highly dynamic and complex, as is the case for MSI in China. First, FCM allows “an unlimited number of concepts and reciprocal causal relationships” (Özesmi & Özesmi, 2004, p. 46). Concepts can be generated from an interview, text analysis, or group discussion (Jetter & Kok, 2014) and are defined as “things” (e.g., identity and resilience) in which the degree of influence (relations and strength) between them can be interpreted. Second, FCM is beneficial in a data-poor situation because it is a participatory approach (Gray et al., 2015; Özesmi & Özesmi, 2004) involving informants who have rich experience and a deep understanding of a particular phenomenon. Informants actively contribute to the process of constructing links between concepts. Third, by capturing knowledge in a graphical form, FCM allows informants to focus on

explanations of the cause–effect relationship between concepts. Lastly, FCM allows the aggregating of individual cognitive maps into a unified “social” cognitive map through addition of input values that weigh the strength of causal relationships between concepts. This aspect of FCM involves adding the values of relationship strength and balancing various perceptions from experts on the same or similar phenomenon, making the results more reliable (Jetter & Kok, 2014).

## Sample and data collection

We employed a heterogeneous approach in theoretical sampling (Siggelkow, 2007) using selection criteria that sought variation in terms of the type of service, ownership, location, and firm size. An initial screening identified suitable Chinese firms that had experienced disruptions in the recent past. Different types of organizations were approached through various institutional and professional connections and channels in China. This allowed the establishment of dialogue, in Chinese, with potential interviewees and the identification of key informants with an innate understanding of the environmental uncertainty faced by their organization, as well as deep knowledge of the relationships their organizations had with external actors. Seven companies met the criteria and agreed to participate (Table 1).

Data collection proceeded in two phases (see Appendix A). During Phase I, semi-structured interviews were held face-to-face at the premises of the organizations in Beijing, Shanghai, and Chengdu. Mandarin was used in the interviews, supplemented with English where appropriate. As the data collection required extensive travel to and within China and to meet the schedules of the interviewees, we contacted and held a dialogue with each case prior to each trip. The main interview in Phase I ranged from 60 to 90 min. These were all digitally recorded and transcribed to limit any confusion and mitigate the risk of losing data. A field notebook was also used to record additional information, including wrap-up and clarifications after the interview, and critical and

**TABLE 1** Sample cases.

Case	Sector	Type of service	Year established	Ownership	Size	Location
1	IT & Mobile Telecoms	PS	2010	Private	Medium	Shanghai
2	IT & Financial Services	SO	2012	Private	Small	Shanghai
3	Engineering Consultancy	PS	2008	Private	Small	Beijing
4	Private Equity Finance	SO	2012	Private	Large	Shanghai
5	Real Estate	PS	2010	State	Large	Shanghai
6	Banking	SO	1908	State	Large	Chengdu
7	Insurance	SO	1991	State	Large	Shanghai

*Note:* Small-sized case (<£6.5 M turnover and <50 employees), medium-sized case (<£25.9 M turnover and <250 employees), and large-sized case (>£25.9 M turnover and >250 employees).

Abbreviations: PS, product service; SO, service only.

analytical thoughts. In all of the cases, several follow-up interviews were held virtually or telephonically to ask additional questions arising during data analysis. To maintain data reliability and validity, the original interview transcripts were sent back to the informants for them to check and correct. Phase I data were used to identify attributes of IORs present in the organizational environments of the sample cases.

In Phase II, we followed Özesmi & Özesmi (2004) and used FCM to capture executives' mental models of how their organizations cope with disruptions through the attributes of IORs identified in Phase I. The lead author made a second trip to China and conducted a series of FCM exercises at the premises of each of the case organizations. These lasted for 120 min on average. The result was seven FCM maps (one for each case) showing connections between IOR attributes and resilience as viewed by each informant. These were validated, and follow-up interviews were conducted for additional validation and refinement of the maps.

## Data analysis

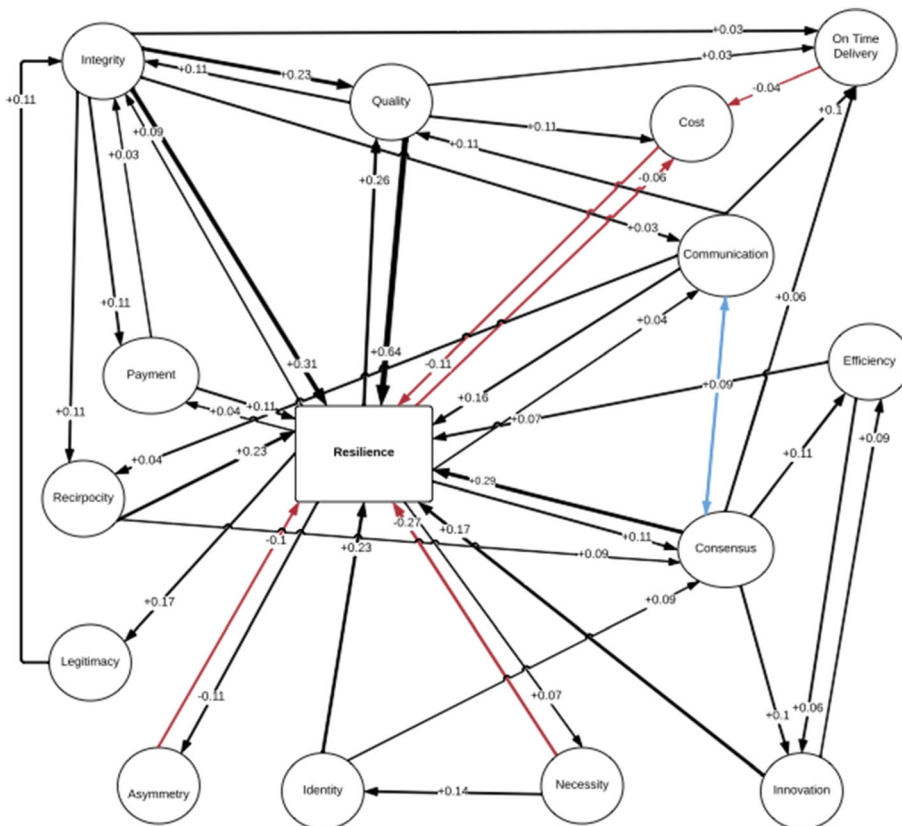
We analyzed our data using an abductive process that requires researchers to construct theoretical models while remaining disciplined. This analytical process involves connecting empirical observations and evidence to extant theoretical ideas in order to “generate novel conceptual

insight and distinctions” (Langley et al., 2013, p. 11). Three steps were used:

### Step 1: Inductive coding

We conducted an intensive, fine-grained reading of the Phase I data and generated a dataset for the attributes of IORs. We first undertook a visual mapping exercise (Langley, 1999), focusing on external *structural* linkages (not reported in the current paper) each focal organization had with partner organizations. The key strategic activities are measured by two dimensions: the flow of resources and information (Christopher & Holweg, 2017) and the value created (Cao et al., 2018). The development of the structural maps was a highly iterative process, during which we had several follow-up meetings with informants for clarifications of connections. The structural maps helped us to understand the type of actors each organization was connected to and how the organization transformed inputs into outputs in order to create value.

As is common in inductive research, we then used open coding to analyze the characteristics of *relational* connections and categorize the data accordingly. Through iterative processes of revisiting the data and fine-tuning our codes, we gradually consolidated and settled our codes into first-order categories, and then into 14 second-order themes representing relational attributes (Gioia et al., 2013). To enhance the reliability of data analysis, provisional interpretations were submitted to



**FIGURE 1** Initial social cognitive map derived from individual maps

some informants for feedback. One researcher, who had no prior exposure to this research, was asked to provide independent views on the coding of data, after reading selected original interview transcripts. Discussions were held with the researcher about discrepancies, emerging codes, constructs, and dimensions.

Step 2: Developing aggregate dimensions through FCM

In the Phase II interviews, we presented the 14 relational attributes generated in Phase I to informants and asked them to identify causal relationships between them and organizational resilience. In this way, we obtained seven individual fuzzy cognitive maps (FCMs). Guided by graph theory, we coded each FCM into adjacency matrices in form  $A(D) = [a_{ij}]$  (Harary et al., 1965; Özesmi & Özesmi, 2004). By using matrix addition, an initial aggregate social cognitive map was created (Figure 1). This involves superimposing the maps onto each other and summing the values on connections between constructs. Following Özesmi & Özesmi (2004), we simplified the initial cognitive map by removing lines with low relational strength (<0.1 in absolute terms) to bring out the most prominent relationships. We then created a condensed social cognitive map (Figure 2) by grouping the variables into sub-graphs according to their connections (Özesmi & Özesmi, 2004). The final data structure linking the 14 IOR attributes (Phase I) and the subgraph themes (Phase II) is shown in Figure 3.

Step 3: Building a grounded model

In this step, we developed the final model (Figure 4) based on the condensed cognitive map, using the relational strength between each IOR aggregate dimension and resilience, as well as its centrality. The relational strength of each dimension is an addition of the second-order themes, and the centrality (Table 2) was calculated based on the average of the outdegree (out-arrows) [ $od(v_i)$ ] and indegree (in-arrows) [ $id(v_i)$ ] in each aggregate dimension (e.g., Eden et al., 1992; Harary et al., 1965).

RESULTS

Phase I—Fourteen attributes of IORs identified

The 14 IOR attributes identified from the transcribed interview data in Phase I were necessity, asymmetry, reciprocity, efficiency, legitimacy, identity, quality, integrity, communication, consensus, payment, cost, on-time delivery, and innovation. These are described below.

Phase II—Relationships between IOR attributes and resilience

Forty-three connections among the IOR attributes were found on the initial social cognitive map (Figure 1).

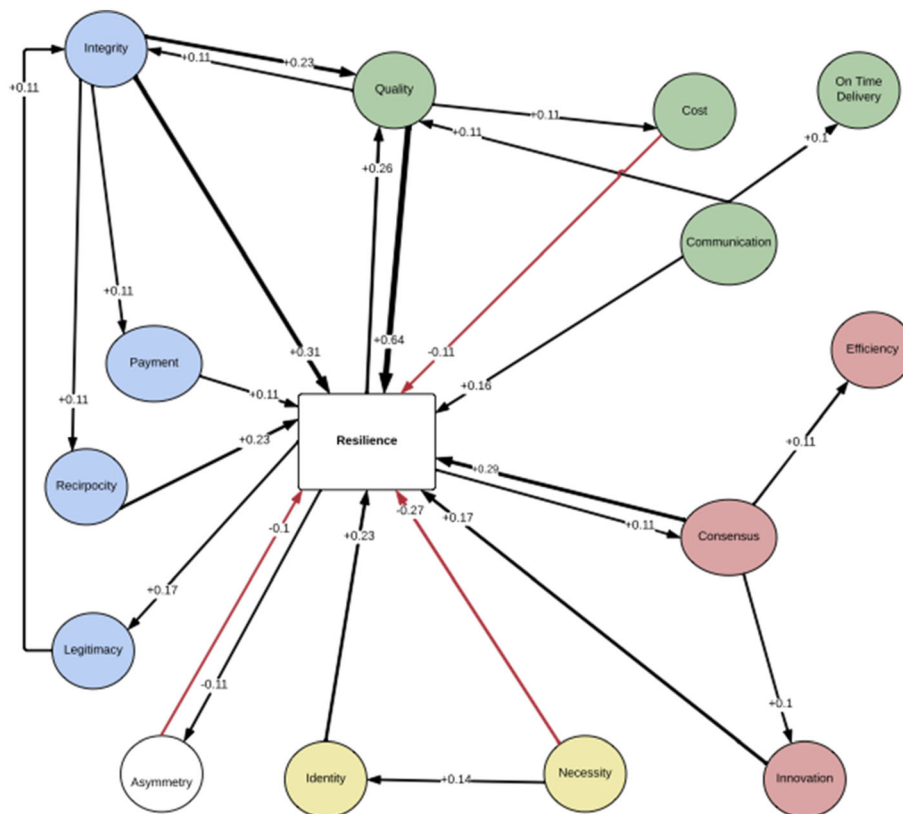


FIGURE 2 Condensed social cognitive map (threshold > 0.1) with subgraph groupings



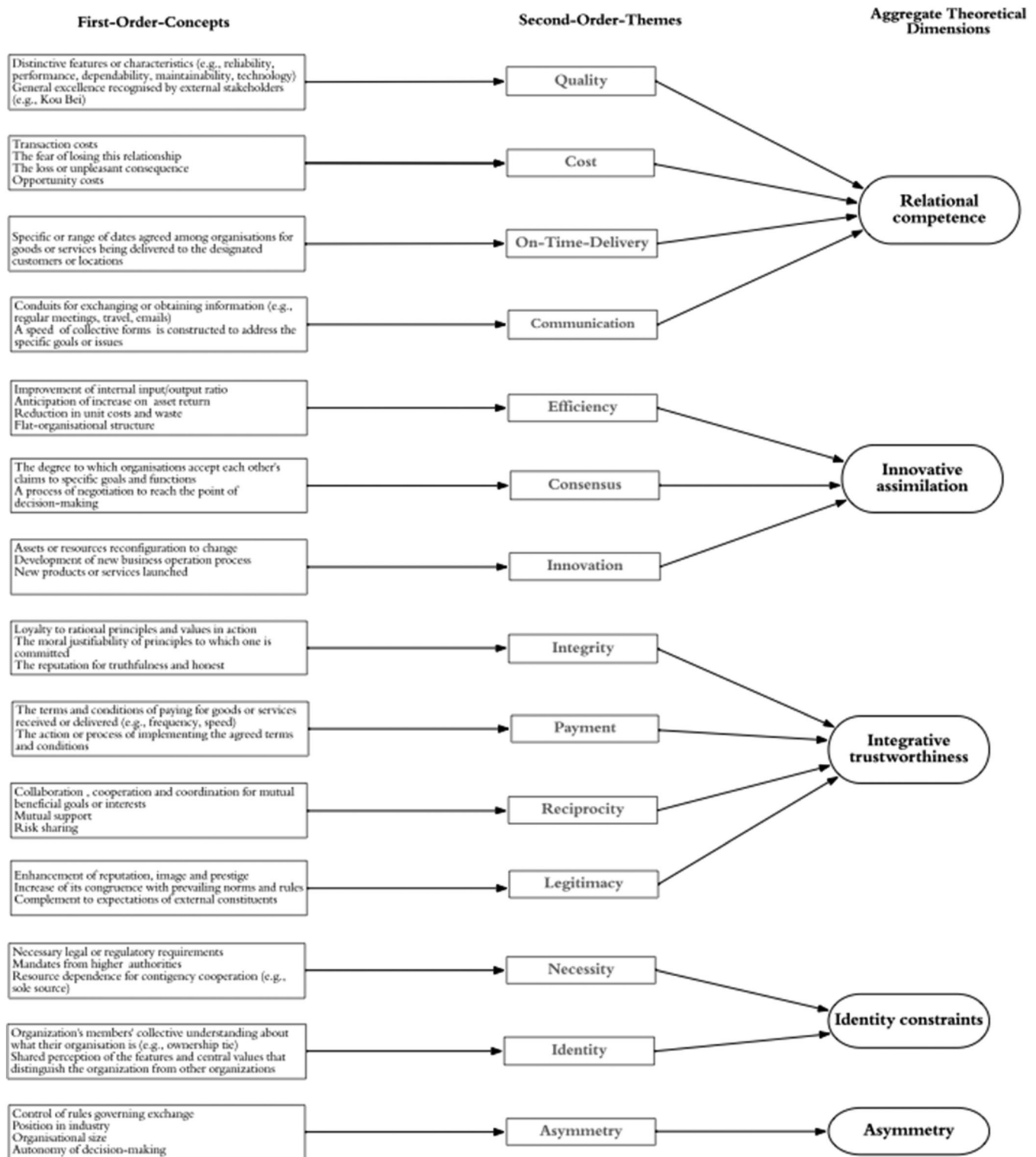


FIGURE 3 Relational resilience data structure

Figure 1 shows also the strength of these connections. We note that the impact of IOR attributes on resilience varies in terms of sign (positive/negative impact) and strength. The IOR attributes having positive direct effects are quality, integrity, consensus, reciprocity, identity, innovation, communication, payment, and efficiency. The IOR

attributes with negative direct effects are asymmetry, cost, and necessity. On-time delivery and legitimacy do not have a direct effect on resilience, being mediated by the effects of cost and integrity, respectively. We also see feedback loops from resilience to nine IOR attributes: Cost and asymmetry are negative. Others are positive:

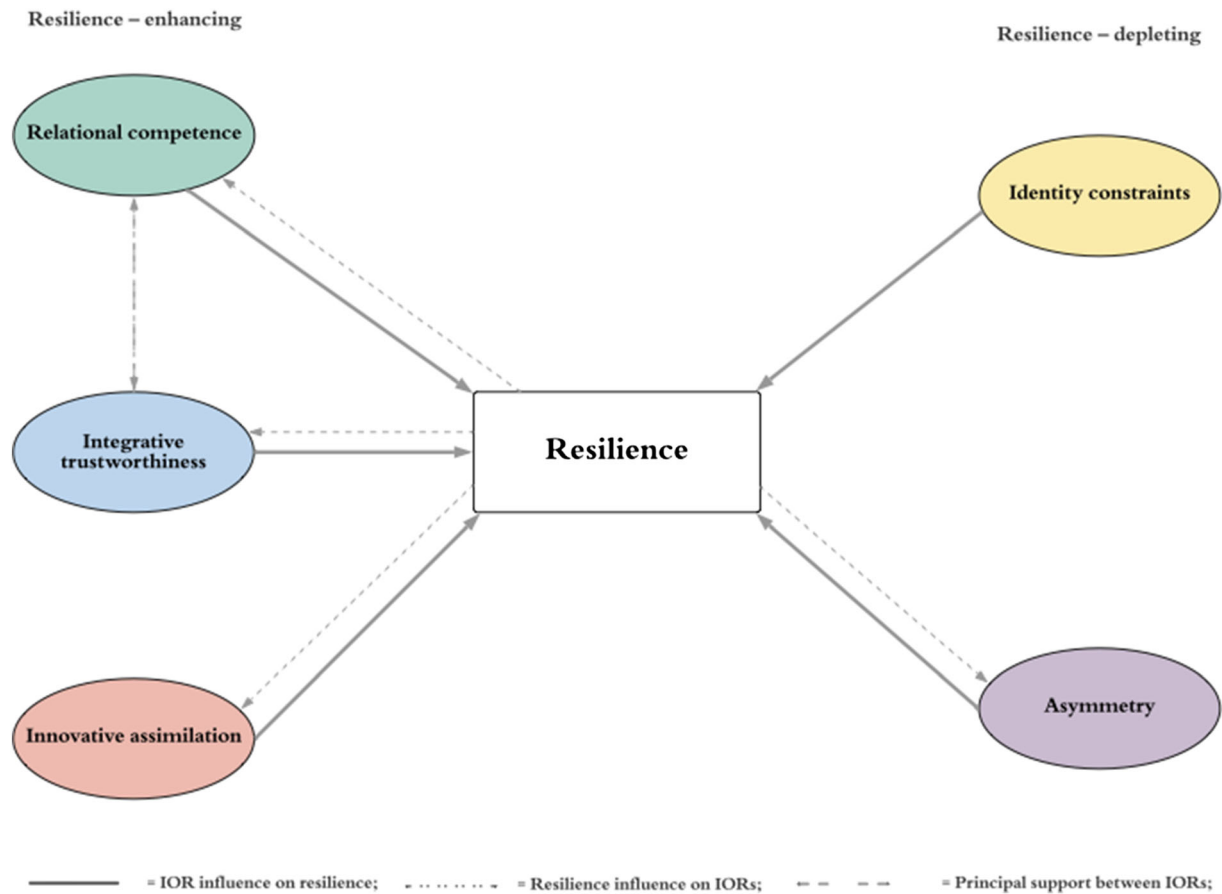


FIGURE 4 Emerging model of interorganizational relational resilience

TABLE 2 Indices for the adjacency matrix coded from the fuzzy cognitive map.

Aggregate dimension	Second-order themes	In-degree	Out-degree	Centrality	Ave. centrality
Relational competence	Quality	0.60	0.90	1.50	0.68
	Cost	0.21	0.11	0.32	
	Communication	0.16	0.50	0.66	
	On-time-delivery	0.21	0.04	0.25	
Innovative assimilation	Efficiency	0.20	0.13	0.33	0.59
	Consensus	0.37	0.64	1.01	
	Innovation	0.16	0.26	0.42	
Integrative trustworthiness	Integrity	0.34	0.83	1.17	0.56
	Payment	0.16	0.14	0.30	
	Reciprocity	0.16	0.31	0.47	
	Legitimacy	0.17	0.11	0.28	
Identity constraints	Identity	0.14	0.31	0.45	0.47
	Necessity	0.07	0.41	0.48	
Asymmetry	Asymmetry	0.11	0.10	0.21	0.21

legitimacy, payment, integrity, quality, communication, consensus, and necessity. There is a complex interplay among IOR attributes themselves (23 connections).

Figure 2 shows the condensed map and subgraph groupings. Figure 3 shows the resultant data structure

combining the results of Phase I and Phase II. By applying the condensing step, the number of connections reduces to 25 and includes 11 connections among IOR attributes, which enabled us to create aggregate dimensions via five subgraph groupings (Figure 2). We label

these *relational competence, innovative assimilation, integrative trustworthiness, identity constraints, and asymmetry*. To understand their contributions to organizational resilience, Table 2 shows the centrality of each aggregate dimension, both the frequency of expression and the importance of each dimension in the relational structure.

## Dimension 1—Relational competence

*Relational competence* is seen as a unique and dynamic resource generated by two or more organizations through their ongoing interactions. It is based on four IOR attributes: *quality, cost, communication, and on-time delivery*. The quality attribute relates to distinctive partner characteristics (reliability, performance, dependability, and technology), that is, “Kou Bei” in Chinese: general excellence recognized by stakeholders. This recognition can be accumulated over time through sustained and effective interorganizational problem solving, as noted by Ariño et al. (2005). Case 4 indicated,

In our industry, Kou Bei is a principle in forming any relationships. A good “Kou Bei” allows us to attract and retain human capital in high-level jobs, [people] who are often resourceful problem-solvers in the face of disruptions ... they are in a strong social position with more extensive connections and relationships with other organizations in which we may realize potential resources in order to cope with disruptions.

Cost reduction acts to create financial slack generated in IORs. As noted by Williams et al. (2017), financial slack is key to resilience in organizations. Not only does it enable organizations to stockpile financial resources needed to withstand adversity, but it also helps to maintain other endowments (cognitive, emotional, and behavioral) necessary for functioning in organizational networks. Unsurprisingly, our data show that cost (lack of cost reduction) has a negative impact on organizational resilience. Case 1 indicated,

[The] smartphone industry in China is a highly dynamic and competitive industry in which a firm’s survival is threatened, especially for SMEs like us because of expensive resources.

Communication enables two or more organizations to formulate appropriate tactics and strategies through shared meanings in the face of adversity. When an organization articulates its struggles in ways that have meaning for others, it is likely to receive dialogue and responses from other organizations to support effective actions to deal with the disruption. As Case 1 said,

When disruption occurs, we would have an open discussion at both the organizational level and the stakeholder level and try to come up with the solution. Once our decision is made, we would quickly implement the new strategy.

On-time delivery, with its scholarly origin in the supply chain management literature (Kamalahmadi & Parast, 2016), highlights the notion of having minimal inventories. On-time delivery in our data relates to the contractual specification of what is to be delivered and when, where, and how. On-time delivery is at the periphery of the map and does not have a direct effect on organizational resilience, although it is seen as an intrinsic part of relational competence.

## Dimension 2—Innovative assimilation

This is a highly adaptive capability involving three IOR attributes: *consensus, efficiency, and innovation*. Consensus is a collective sense-making process among actors (Ariño et al., 2005) and has a positive influence on resilience. Reaching consensus is a process of generating a shared cognition among various actors to understand the causes and consequences of disruption. This provides a basis in which decision-makers direct their attention to the best options available in order to respond. This has been referred to as “cognitive response” (Williams et al., 2017) or “cognitive elements of organizational resilience” (Lengnick-Hall et al., 2011) in the literature. Our data show that when unexpected situations occur, divergent views among actors arise. Actors draw on specific knowledge bases and prior experience to interpret and analyze adversity in many ways. Thus, reaching a consensus in terms of how to respond to adversity can be delayed or even fail. Case 1 noted,

It becomes a very painful process in reaching congruence with some of our people including our business partners who resist in changes to implement.

When resources are gradually stretched, the efficiency of business operations is undermined. This is why we see efficiency to be strongly influenced by consensus on the map. Our findings suggest that organizations weigh the consequences of delay by applying a cost/benefit analysis to decide between waiting and alternative options. Case 4 mentioned,

Responding [to disruptions] will be delayed if business partners don’t agree with each other quickly ... and of course, there is a cost associated with this delay but we have to wait ....

Innovation supports resilience through identifying and reconfiguring existing resources to develop new products or services. These creative actions involve multiple actors who act upon and integrate both cognitive and behavioral responses to address environmental uncertainty (Lengnick-Hall & Beck, 2005). As Case 7 indicated,

As an introduction of new technology, we formed the joint venture with an American firm, one of the top 10 companies in the US care-home services industry.

### Dimension 3—Integrative trustworthiness

*Integrative trustworthiness* has a strongly positive impact on organizational resilience and comprises *integrity*, *payment*, *reciprocity*, and *legitimacy*. It is a risk-taking willingness of one party (trustor) to be vulnerable based on the expectation of the other party (trustee). Integrity in Chinese consists of two ideograms “honesty” (Chen) and “reliability” (Xin), which serve as a foundation for building a trustworthy relationship. Honesty refers to moral integrity perceived by a trustor on the ability of individuals who act for the trustee’s organization in adhering to a set of principles that the trustor finds acceptable. Reliability involves the action of a trustee consistently delivering the commitment in accordance with principles and values accepted by the trustor. The positive outcome enhances the level of risk-taking willingness of the trustor, which is critical for organizational resilience. Case 4 noted,

For those clients with whom we have already built a trust relationship, during the crisis, they stand by us, and our relationship will be further strengthened when we successfully cope with the disruption.

Payment is the transfer of any quantifiable and verifiable item from one to another for an exchange in order to fulfill a given task. Our data show that payment has a positive impact on organizational resilience. Having payment in the written contract does not only put pressure on both parties to meet their obligations on time but also creates a psychological contract on the importance of the specific IOR activity. Thus, breaching the written contract does not necessarily terminate cooperative relationships but it does violate the psychological contract, which can fracture relationships in the short term (Olekals et al., 2020). Case 7 told us,

Our business operates in less developed countries where the local governments often make an ambitious development plan in their regions beyond their capacity. This causes

failures in making the payment to us. We would have to temporarily stop the current project until the payment is made.

Reciprocity highlights the motives of IOR formation based on a mutuality of interests and benefits, both socially and economically. Although reciprocity can exist without trust or with low trust at the beginning of relationships, the level of trust evolves through reciprocity-based interaction between parties and can lead to increased risk-taking behavior. Case 1 indicated,

The fundamental thing is about mutual interest, which is built on real value you can bring to your business partner or your business partners bring to you, to achieve your goals.

Our data show a positive relationship between reciprocity and organizational resilience. In addition, the condensed map also suggests that reciprocity is positively influenced by integrity perceived by the trustor based on the positive experience where the trustee acted in good faith. Legitimacy affects resilience through integrity. The notion of legitimacy in IORs reflects the degree of acceptance of the firm’s behaviors by its partners or stakeholders who may hold different norms and values.

### Dimension 4—Identity constraints

*Identity constraints* consist of *identity* and *necessity* attributes and negatively impact organizational resilience. Identity refers to core values organizations articulate and act out. These reflect deeply rooted assumptions of the organization concerning “who we are.” Our data show that organizations’ core industry and ownership form (state-owned vs. privately owned) are the strongest forms of identity influencing organizational actions in relationships. Case 5 stated,

As we are a large state-owned high-tech park developer, our targeted buyers are not only companies with capital but also they have to be well-known companies in the industry.

The organizational strategy revolves around identity; core features of organizational identity “are presumed to be resistant to ephemeral or faddish attempts at alteration” (Gioia et al., 2000, p. 64). From the perspective of resilience, this can protect organizations from potential damage (Williams et al., 2017). Organizational identity provides organizational members with a needed sense of psychological anchoring for stability. During the disruption, this is important because being able to construct a stable environment allows people to direct their attention to problems and issues to which they can form a positive cognitive response (Weick, 1993). This explains the

positive influence on the relationship between the identity attribute and organizational resilience.

However, when there is a strong influence of certain institutional forces on IORs, such as a mandated relationship from higher authority, we have a positive link between *necessity* and *identity*; the mandated relationship creates constraints on the scope of what organizations can do. One of the consequences is inflexibility in responding to the changing environment, which undermines organizational resilience. As noted by Oliver (1990), the mandated relationship can also be voluntary. Our data show that accessing the scarcity of resources is another reason to form an IOR, but this is done voluntarily. Although having an awareness of the risk being involved in the relationship can generate the “threat-rigidity effect” (Staw et al., 1981), it also creates and accumulates emotional and cognitive negativity. As Case 1 said,

As our software development exclusively relies on Google’s Android system, which determinates our destiny, we worry that one day Google may decide not to open its resources to us.

### Dimension 5—Asymmetry

The IOR attribute of *asymmetry* does not have any connections to other IOR attributes but has a negative relationship with resilience. As Oliver (1990) pointed out, *asymmetry* is prompted by one party who exercises power over the other party in the relationship. This creates a power–imbalance that reduces relational flexibility between organizations working together. In Case 3, the less-powerful party reduces its willingness to continue working together,

As our business operates in some countries in Africa that do not have a well-established institutional system, our clients are local governments, which are very powerful. We can’t win any lawsuits when they have breached the contract [...] we would have to pause the project.

Asymmetry also includes situations in which one party (e.g., service provider) exploits the information between itself and the other party (e.g., service buyer). Our data show that the consequence of this undermines organizational resilience in the long term because the exploitation of information asymmetry can erode trust in the relationship.

## DISCUSSION

The current study explores the determinants of organizational resilience from an IOR perspective in the context

of Chinese MSI firms. As organizational resilience research acknowledges the complexity and unpredictability of business activities (Andersson et al., 2019), some important work has alluded to IORs as a theoretical lens for understanding organizational resilience (Lengnick-Hall & Beck, 2005; Williams et al., 2017). Not only does the IOR literature offer a breadth of theories in studying various types of relationships ranging from a dyadic relationship between two organizations to a network relationship consisting of interactions among numerous organizations, but it also emphasizes the characteristics of IORs that can adaptively respond to environmental uncertainty (Barringer & Harrison, 2000; Oliver, 1990). However, much prior empirical research on organizational resilience focuses on intraorganizational reliability rather than external relational dynamics between organizations. The need to understand organizational resilience, both theoretically and empirically, from the perspective of IORs is reinforced by several calls in recent years, with a particular focus on how resilience is activated through interactions among actors at the system level (Bhamra et al., 2011; Linnenluecke, 2017; van der Vegt et al., 2015; You, 2021).

We respond to these calls and provide substantive evidence of a highly complex interplay between many facets of IORs in determining the resilience of MSI firms in China. We identify 14 second-order IOR attributes at play, including five of the six of Oliver’s (1990) determinants of IORs: *necessity*, *asymmetry*, *reciprocity*, *efficiency and legitimacy*, and other nine relational attributes (see Figure 3). One possible explanation of why the *stability* IOR in Oliver’s (1990) does not appear and why we have seen other emerging IORs in our study may lie in three reasons. First, the extant literature on IORs in relation to uncertainty places an emphasis on pre-adversity organizing in which organizations establish and maintain their relationships with others in order to achieve stability and predictability. The underlying assumption is that doing so can help to anticipate and prevent disruption (Andersson et al., 2019; Sutcliffe & Vogus, 2003). However, once organizations are exposed to disruptions, there is a wide range of responsive actions taking place that can create a heightened degree of uncertainty and the need for a different combination of IORs. Our approach emphasizes post-adversity organizing. Second, much of the IOR literature has been based in Western contexts, which are in sharp contrast to the Chinese MSI context. As Linnenluecke (2017) pointed out, resilience research to date has been highly context-dependent resulting in different conceptualizations and approaches. By shifting the research context, our study uncovers more IOR attributes emerging from disruption, such as *quality*, *community*, and *consensus*. Third, although some have questioned the importance of stability in ecosystems to organizational resilience (Linnenluecke, 2017), our approach is different because it does not necessitate the placement of a focal organization within any specific

ecosystem where all organizations have a joint defined goal for value creation. Indeed, we treat IOR attributes as more than contextual conditions of tie formation (Lengnick-Hall et al., 2011; Oliver, 1990) for a specific purpose (as one finds with the ecosystems approach) but rather as a system of second-order themes that interrelate with each other as well as with resilience in a broader open system of relationships.

To explore how the 14 IOR attributes interact with each other, we employed the FCM technique in the second stage of data collection. Our findings reveal more complex interactions than those previously presented in the literature (see Figure 1). Some IOR attributes have more connections than others, forming several clusters (see Figure 2). These are labeled as five aggregate dimensions: *integrative trustworthiness*, *relational competence*, and *innovative assimilation* that enhance resilience, and *identity constraints* and *asymmetry* that undermine resilience. The emerging dimensions have somewhat discrete theoretical foundations, underscoring a point made by Frigotto et al. (2022): "... the phenomenon of resilience can be seen as an elaboration of existing theories that frame the interactions between organizations and an increasingly unstable and unpredictable external environment" (p. 7). In addition, the mapping also reveals "feedback" effects between resilience and IOR attributes, emphasizing the important role of learning for resilience (Williams & You, 2022; You et al., 2021). Our study sheds a light on "relational adaptation" (Williams et al., 2017) in activating resilience (Linnenluecke, 2017). By extending concepts from the IOR literature to the study of organizational resilience, our study complements the emerging research on relational resilience (Barton & Kahn, 2019; Olekalns et al., 2020).

## Theoretical implications

Our analysis suggests that both resilience-enhancing and resilience-depleting relational attributes coexist. Figure 4 provides a schematic showing these determinants in our final model.

*Resilience-enhancing IOR determinants* include relational competence, innovative assimilation, and integrative trustworthiness. We note that, although a separate dimension for interorganizational learning did not emerge from our method, learning is very much a part of all of these three resilience-enhancing IOR dimensions. It is conspicuous in three lower level IOR attributes: communication (part of the aggregate dimension relational competence), consensus (part of innovative assimilation), and reciprocity (part of integrative trustworthiness). It is not surprising that we see relational competence having the highest centrality (Table 2) and strongest impact on organizational resilience. This is consistent with the logic of IOR formation and contingency that IORs form in order to exploit existing resources or explore new

opportunities in order to manage uncertainty, not just to create new value (Oliver, 1990). This is very much supportive of scholars (e.g., Barton & Kahn, 2019) who recognize that resilient organizations are able to recombine a variety of resources to manage adversity. Relational competence provides a foundation for resource access and recombination that organizations need to sustain themselves amidst adversity. Of most importance here are the quality of partners (a characteristic related to the distinctiveness of partners, and one not identified in prior IOR work) and communication (which is more congruent with IOR studies). It is also interesting to see feedback effects from resilience within this grouping, namely, via the second-order theme of quality (Figure 2). This suggests that resilient outcomes make interrelated organizations appear more distinctive and recognized for excellence.

Integrative trustworthiness has the integrity as the strongest second-order theme. This is linked to mutual trust, supporting scholars showing this as a foundation for developing relationships that create "a positive emotional climate" and that facilitate "a more flexible and creative approach to unforeseen events" (Olekalns et al., 2020, p. 32). Positive emotions based on high mutual trust make interpretations of unexpected events more "generous." We note also a positive feedback loop from resilience to integrative trustworthiness through the legitimacy construct. When an organization successfully manages disruptions, the outcome generates positive emotions between partners toward the relationship, underpinning the justification for the relationship and enhancing its reputation in the eyes of more distant stakeholders.

It is noteworthy that relational competence and integrative trustworthiness are positively interrelated. Relational competence considers a partner's reputation as a desirable resource that a firm would like to access. This has a buffering effect on the firm during and after disruptions. Reputation, according to Parker et al. (2019, p. 256), refers to "... stakeholders' perceptions about whether the firm will deliver certain outcomes or perpetuate certain behaviours." This embraces trust-related second-order themes such as integrity and payment, and how these determine whether a firm's future action can be reliably predicted from the firm's behavioral tendencies and past actions. On the other hand, higher integrative trustworthiness also leads to higher relational competence because it allows an organization to access the critical resources and capabilities needed before, during, and after disruptions.

The third resilience-enhancing determinant is innovative assimilation. This demonstrates an adaptive capacity of an organization to recognize and reconfigure resources efficiently in response to disruptions. This provides a basis under which a critical feature of organizational resilience—"bouncing forward" (Manyena et al., 2019)—will emerge. Here, we also see a positive feedback effect

from resilience to consensus (Figure 2). This suggests that resilient outcomes will reinforce different partners' acceptance of each other's claims concerning how resources are destroyed or reconfigured under adversity. This is aligned with a learning process for bouncing forward as enacted within an open system view rather than a purely internal view. Although innovation between partners does feature here, we note consensus to have the highest centrality (Table 2). Other actors will have potentially different views on the use of resources in the response to disruption, as well as on the role that innovation will play. It becomes necessary to assimilate the views of other actors efficiently, and this is essentially a learning process. This supports Weick and Roberts (1993, p. 357) who noted organizational resilience to be enacted by "a pattern of heedful interrelations of actions" involving humans. We also see a positive feedback effect between resilience and consensus (Figure 2), suggesting resilient outcomes reinforce partners' acceptance of others' claims concerning how resources are destroyed or reconfigured under adversity.

*Resilience-depleting IOR determinants* include identity constraints and asymmetry. Unlike innovative assimilation, which clearly has a "bouncing forward" effect of IORs, identity constraints and power asymmetry are more aligned with pressures exerted by IORs on the focal organization to "bounce back," in other words, not to change and to try to return to a previous equilibrium ante-disruption (Manyena et al., 2019; Wildavsky, 1988). Identity constraints were dominated by ownership type, that is, state-owned versus privately owned enterprises, in our study. These constraints provide a reference point with respect to "what we can do and what we cannot do" as a consequence of deep-rooted ties. Mandates from higher authorities with which the organization has a relationship can constrain effective responses. Our finding here is supportive of Dutton & Dukerich's (1991) work on (constraints on) organizational adaptation. They find that organizational identity influences how issues or problems are interpreted, as well as motivations for responding to them. It also resonates with the concept of "pluralistic ignorance" discussed by Weick (1996). Over time, these tendencies may creep up and even exacerbate the disruption (Kahn et al., 2018).

Power asymmetry in relationships is negatively associated with resilience. Many factors may influence this including differences in expertise, size, dependence, and switching costs. Although a more powerful firm can exploit the relationship to appropriate more value, it is unlikely to maintain the relationship in the long term. The exploitative use of power attenuates the ability to bounce forward because the weaker partner becomes unwilling to cooperate or may engage in costly litigation and conflict, ultimately undermining its ability to change and cope with disruption. However, we also capture a negative feedback impact between resilience and power asymmetry (Figure 2). This suggests that the more

resilient the organization becomes through its IORs, the less likely power asymmetry will continue to be problematic in the future.

The emerging model in Figure 4 highlights three fundamental tenets for theorists of IORs and resilience to consider going forward. The first is that, when viewed as open systems, firms will inevitably develop IORs that can be described in terms of relational attributes, not just structural ones (Andersson et al., 2019). Given that all firms exist as open systems, these IOR attributes are what ultimately determine the resilience of the firm. The second tenet is that interactions between attributes of IORs can vary, leading to either a positive influence or a negative influence on organizational resilience. The strength of the (positive or negative) effects can also vary depending on the attribute. The third tenet is that the feedback effect from resilience to IOR attributes emphasizes the symbiotic association between resilience and IORs, which has an important implication for theory development within the emerging field of "resilience activation" (Linnenluecke, 2017; You, 2021).

## Practical implications

In addition to contributing to theory, this study suggests several important lessons for organizations building resilience. First and foremost, organizations engage with a diverse range of actors (e.g., government, suppliers, and customers) in order to access various resource endowments when organizing for resilience. However, diverse actors will have diverse values, frames, and perceptions and may formulate problems and associated solutions differently. This can lead to complex and unpredictable interdependencies, resulting in either positive or negative outcomes. Our study shows that certain relational mechanisms (relational competence, innovative assimilation, and integrative trustworthiness) help to build and reinforce a collectively held orientation when responding to disruptions, whereas other relational mechanisms (identity constraints and asymmetry) serve to undermine resilience. Although these negative aspects may be context-specific (see comment on this below), managers should be sensitive to them. We recommend that managers and organizations develop a systematic way of continuously assessing the nature of their relationships with diverse actors in order to make positive adjustments through them when unexpected disruptions arise.

Second, given the key role that organizational learning plays in organizational resilience research (Williams & You, 2022; You et al., 2021), managers should pay attention to the need to challenge any predetermined beliefs, assumptions, and behaviors that may obstruct the learning process when coping with unexpected crises (Vu & Nguyen, 2022). Our findings show that "identity constraints" concerning "who we are" in relation to others can create cognitive and emotional

barriers for organizations when adapting to a changing environment; identity constraints act to undermine resilience. Managers are encouraged to be critically reflective on these constraints and be prepared to challenge beliefs, assumptions, and behaviors that may obstruct effective learning.

Finally, our findings suggest that interorganizational relationships based on “asymmetry” can be vulnerable to disruptions. This relates to the demarcation of boundaries between an organization and its stakeholders in terms of power and information. Our study supports the view that resilience in practice depends on cooperation within the system as a whole (Andersson et al., 2019); high levels of asymmetry in relationships can lead to uncooperative behavior. We recommend that organizations are particularly sensitive to these types of relational characteristics as they have important implications for “bouncing back” or “bouncing forward.” Organizations should seek wherever possible to promote resilience-enhancing dimensions of IORs and minimize resilience-depleting ones, especially in the more stable times before a shock actually occurs.

### Would these results differ between the Chinese and Western contexts?

In choosing our empirical context, we noted a complex set of challenges for Chinese MSI firms (Wang et al., 2014; Wu, 2007) and how this is an ideal context for examining the influence of IORs on organizational resilience. To date, the Chinese MSI context has been largely unexplored in work on resilience and work on IORs. Much prior work on resilience and IORs has been conducted in Western contexts or has been conceptual in nature (Alberts et al., 2016; Barton & Kahn, 2019; Gulati & Singh, 1998; Lengnick-Hall et al., 2011; Oliver, 1990; Weick & Roberts, 1993; Williams et al., 2017). Our findings have implications for how we understand IORs and resilience in China, as well as how their interplay might differ in Western settings.

First, in terms of the Chinese setting, many of the forces behind the disruptions described by our respondents were Chinese-specific ones. For instance, MSI has evolved rapidly in China, there has been a rapid increase in foreign competition in business services on Chinese soil, and there is also a fundamental Chinese cultural embeddedness of business services. This sheer diversity in forces undergirds the ongoing adversity faced by the sample firms. It also may explain why we see a high number of IOR attributes at play (Figure 3) and why they map into a complex constellation when combined and considered alongside resilience (Figures 1 and 2). To the extent that the emerging cognitive maps are a consequence of this particularly disruptive context, it may be difficult to apply the findings to non-Chinese settings. However, we can argue that complexity in the resultant maps is a direct

result of complexity in the disruptive context. Other complex disruptive business environments around the world may also yield complex cognitive maps using the same method. Second, and as a counterpoint to the previous point, we think that the IORs identified are ones that can apply in Western settings, albeit in different constellations. None of the 14 second-order themes (Figure 3) are *necessarily* Chinese-specific, and they could equally be found in Western firms within their respective interorganizational systems. What may be Chinese-specific is the way in which these IOR attributes interrelate and how aspects such as identity constraints and asymmetry might be particular to the Chinese setting, given the prevalence and power of state-owned enterprises as well as other deep-rooted ties that can restrict degrees of freedom for a firm when confronted by a crisis. Future work can examine how types of IOR attributes uncovered here may interrelate and influence resilience in Western settings.

### Limitations and future research

The present study has several limitations that can be addressed in future research. First, we chose to study Chinese MSI firms, and generalizability to other sectors or countries is not assured. Future research should therefore build upon our findings in other national and industrial contexts. Second, we did not directly observe firms' behaviors in terms of preparing for, responding to, and recovering from disruptions in real time. Frigotto et al. (2022) noted the importance of analyzing resilience temporally. As is well documented in the literature, interview data may be subject to biases resulting from retrospective sense-making and impression management (Eisenhardt & Graebner, 2007). To avoid these biases, we relied on multiple rounds of interviews and other data sources, allowing us to validate and triangulate statements. Although we are confident that our study paints an accurate picture of organizational resilience in Chinese MSI firms, future studies employing a longitudinal technique to observe how firms develop relationships with other organizations in building resilience over time will be useful. A third limitation is that, after providing initial insights into the influence of IORs on organizational resilience, our findings also show a complex interplay of IORs, as well as feedback effects between an organization's resilience and IOR attributes. For analytical purposes, we eliminated some connections between IOR attributes and resilience with low relational strengths. We see the potential for future research that investigates these low-strength IOR attributes more fully. We also see research opportunities in how an organization's resilience influences different aspects of IORs and the conditions in which these effects take place.

Resilience is a crucial capability for organizational survival in times of disruption. This study has been a first attempt at understanding relational resilience from an



IOR perspective in the Chinese MSI context. Given that research on relational resilience is still nascent, our approach employing the FCM technique in an explorative manner opens up the phenomenon by graphically capturing informants' mental models in terms of how various IOR attributes interrelate to enact resilience when organizations are faced with disruptions. We hope future work can build on the present study and extend our understanding of the role of IORs in managing risks and uncertainty.

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## CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

Jacqueline Jing You: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing—original draft, review and editing, visualization. Christopher Williams: Conceptualization, Methodology, Investigation, Writing—review and editing, visualization.

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## APPENDIX: DATA COLLECTION AND ANALYSIS

Phase	Data source and activity	Data analysis	Result (Table/Figure)
Phase I	<ul style="list-style-type: none"> <li>• Preengagement with cases to verify adversity and need to cope with disruption</li> <li>• In-depth semi-structured interviews with all cases during the first round of field visits to companies in China</li> <li>• Interview questions focused on determinants and characteristics of IORs               <ul style="list-style-type: none"> <li>• Field notes</li> </ul> </li> <li>• System diagram per case showing all external actors and types of interactions between focal organization and actors (not reported here)               <ul style="list-style-type: none"> <li>• Secondary data including available documentation</li> </ul> </li> </ul>	<p>Step 1 Inductive coding</p> <ul style="list-style-type: none"> <li>• Transcribing of all interviews in Mandarin</li> <li>• Interview data shared and verified with informants</li> <li>• Translation of transcripts to English</li> <li>• Qualitative analysis of transcripts producing 14 attributes of IORs to be used in Phase II data collection with the same informants</li> </ul>	<p>Table 1</p> <p>2nd-order themes (Table 2 and Figure 3)</p>
Phase II	<ul style="list-style-type: none"> <li>• Fuzzy cognitive mapping exercise with key informants from Phase I during the second round of field visits in China (average 120 min per case) using the 14 IOR attributes identified in Phase I</li> </ul>	<p>Step 2 Developing aggregate dimensions through fuzzy cognitive mapping</p> <ul style="list-style-type: none"> <li>• Initial social cognitive map</li> <li>• Subgraph groupings in condensed social cognitive map</li> <li>• Adjacency matrix</li> </ul> <p>Step 3 Building the grounded model</p>	<p>Figures 1–4</p> <p>Table 2</p>

**APPENDIX: INTERVIEW PROTOCOL**

Company Name:

Interviewee (Title and Name):

Interviewer:

1. Company backgrounds:

1.1 Sector: \_\_\_\_\_

1.2 Type of service: \_\_\_\_\_

1.3 Year established: \_\_\_\_\_

1.4 Ownership tie: \_\_\_\_\_

1.5 Employees: \_\_\_\_\_

1.6 Turnover: \_\_\_\_\_

1.7 Location: \_\_\_\_\_

2. Interorganizational Relationship (Stage 1)

2.1 How would you describe your business networks in both upstream and downstream markets?

2.2 What are general criteria in your company to select business partners in your networks?

2.3 Who are the key actors in your business networks? and why?

2.4 What motivates you to establish these business relationships with these actors?

2.5 How would you characterize these relationships? (e.g., mandatory, volunteer)

2.6 How does your company manage these relationships? (e.g., contract, non-contract, equity, non-equity, technology)

2.7 What are factors that can positively or negatively affect your relationships with your business partners?

2.8 What are some of the major challenges your company faces in managing these relationships? What are the major opportunities?

2.9 How are you involved in managing these relationships?

3. Interorganizational relationship and resilience (Stage 2)

3.1 Can you please select attributes that matter to your organizational resilience? and why?

3.2 How likely do these attributes you select impact organizational resilience?

3.3 Does resilience also impact on these attributes you select?

3.4 How likely does resilience impact these attributes?