

PMI Sponsored Research Grant:

Maximizing Organizational Resilience
Under Institutional Complexity in
Interorganizational Projects

Final Report

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1. Introduction

Large-scale projects are experiencing unprecedented risks and uncertainties. These issues are due to internal dynamics, such as incomplete contracts, varied governance structures, long-term contractual periods, as well as external adversities, namely political, economic, legal, social, and project-specific factors (Khallaf et al., 2018). These large-scale projects, typically involving multiple stakeholders in a specific government structure, such as public–private partnership (PPP), are inherently interorganizational projects (IOPs) and are not immune to these overwhelming risks and uncertainties (Wang & Pitsis, 2019). Hence, organizational resilience, which is defined as the capability to bounce back or return to a stable state in a timely manner after a disruption (Bhamra et al., 2011), has become critical to the successful delivery of large-scale projects. The one-off and temporal nature of these projects, combined with changing requirements of clients and dynamic constraints of project environments, require enhanced resilience. Comprising a multidisciplinary composition of participants employed by independent firms (Lizarralde et al., 2011) and a network of relationships (Pryke & Smyth, 2006), projects are pursued for their integrated ability for resilience from an interorganizational perspective.

The involvement of multiple stakeholders raises the issue of heterogeneity of project participants (Fu et al., 2021). The risks and uncertainties for projects are interwoven with varied institutional logics carried by various project stakeholders (Misangyi, 2016). Large-scale projects face institutional complexity when they confront

incompatible prescriptions from multiple institutional logics (Greenwood et al., 2011). Hence, we argue that the design of governance systems of collaborative relationships should aim for resolving institutional complexity, which further improves organizational resilience for IOPs (Carmeli & Markman, 2011). Research on the resilience of IOPs is still in its infancy and largely emphasizes metrics and heuristics for resilience of these projects (Naderpajouh et al., 2018), while few studies have addressed the resilience from a governance perspective. By adopting a sequential qualitative–quantitative approach, we conduct research based on empirical evidence to address the issue of resilience of IOPs under institutional complexities. Consequently, this research broadens the perspectives of earlier studies by proposing a shift from focusing on operational conflicts to institutional conflicts and has identified a dynamic stakeholder engagement strategy toward improved resilience. This novel perspective is better aligned with practical reality and provides a comprehensive theoretical framework of governance for improved resilience in the face of institutional complexity.

This white paper includes the following sections: Section 1 addresses the motivation and background of this research; Section 2 presents the research questions and objectives; Section 3 summarizes the extant literature and presents the theoretical framework that underpins this research; Section 4 introduces the research methods that have been adopted; Section 5 summarizes and discusses the results of this study; Section 6 presents the practical applications of the findings; and Section 7 offers a summary and concluding comments of this white paper.

2. Research Questions and Objectives

This white paper argues that institutional complexity, inherently rooted in interorganizational relationships, undermines resilience of IOPs and needs to be resolved at the governance level (Sydow & Braun, 2018; Qiu et al., 2019). Therefore, the unit of analysis is the IOP, which typically involves public and private actors, for example PPP projects, to enhance theoretical generalizability and practical applicability. In alignment with this argument, our research aims to develop a theoretical framework for governing IOP resilience. In order to address this issue, it is imperative to answer the following research questions:

RQ1: What is organizational resilience of interorganizational projects?

Then, since institutional complexity undermines organizational resilience of IOP projects, and institutional logics provide individuals a cognitive frame through which to view and understand a particular situation (Thornton et al., 2012; Glaser et al., 2016), it is imperative to first investigate how cognitive elements are steered to affect organizational resilience of these projects. Collective mindfulness has been mentioned as the most important cognitive element for organizational resilience (Weick et al., 1999). There is no systematic

understanding of how collective mindfulness contributes to organizational resilience. It is necessary to fill this knowledge gap by exploring the mindfulness mechanisms that help projects develop resilience to adversity. Therefore, we ask:

RQ2: How does collective mindfulness facilitate organizational resilience in the context of interorganizational projects?

Finally, the impact of interorganizational governance mechanisms on resilience of IOP projects has not been addressed adequately. To gain an in-depth understanding of the relationship between ties among stakeholders, both prior and governed ones, and resilience of IOPs, we attempt to explore:

RQ3.1: How do prior ties among stakeholders and governance design in the interorganizational project support its resilience?

RQ3.2: How do interorganizational relationships impact the resilience of interorganizational projects?

See Figure 1 for the objectives of the study:

- Conceptualize the resilience of IOPs, clarify the dimensions for the resilience of IOPs.
- Identify the mechanisms of the impact of collective mindfulness on the resilience of IOPs and develop an understanding of the resilience of IOPs from a cognitive perspective.
- Identify the mechanisms of the impact of interorganizational governance on the resilience of IOPs, and validate their relationships.

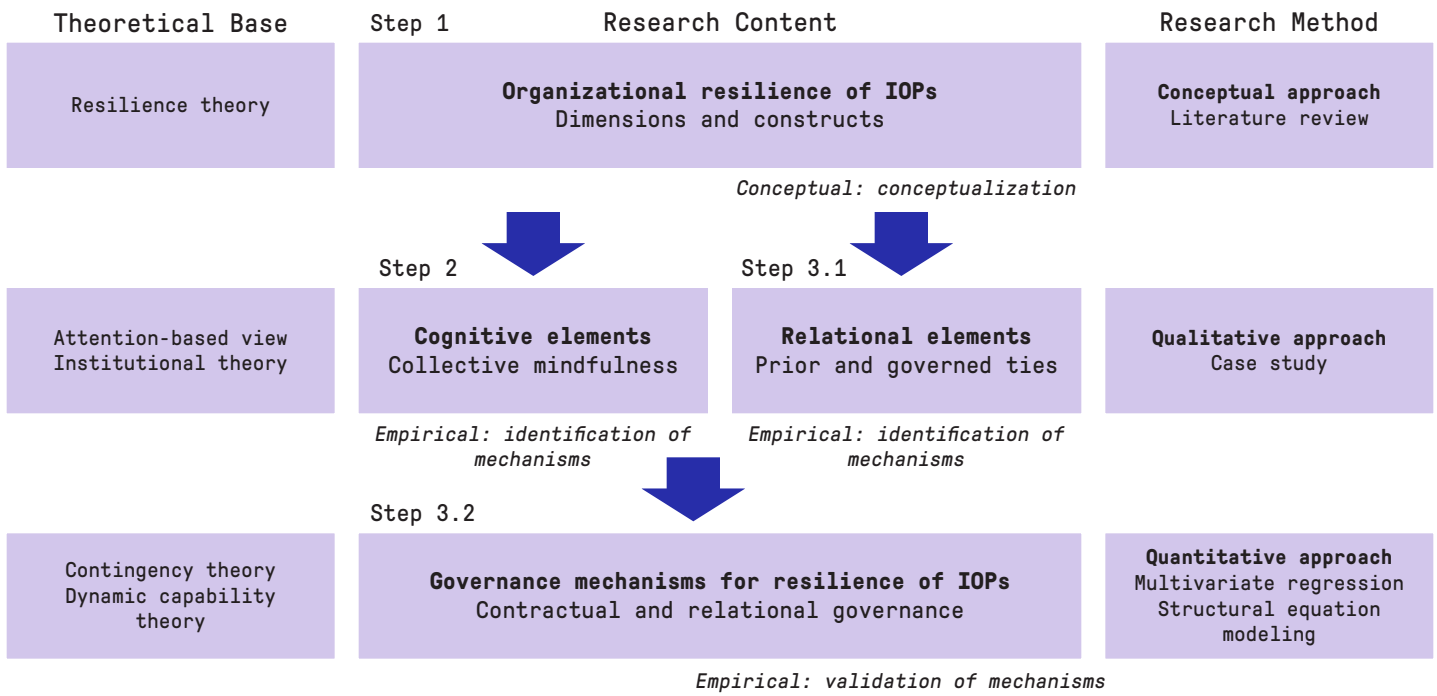


Figure 1. Research framework.

3. Literature Review

3.1 Resilience of Interorganizational Projects

Resilience is widely used in various fields including ecology (Walker et al., 2004), strategic management (Hamel & Valikangas, 2003), and safety engineering (Boin & Schulman, 2019). Organizational resilience shares commonalities with these fields and refers to the dynamic capability of an organization to avoid, absorb, adapt to, and recover from unpredictable disruptions (Bhamra et al., 2011). It can be explained as a proactive capacity to anticipate an event and open a new pathway, and a reactive capacity to resist external events (Williams et al., 2017). Given that projects face various unexpected crises and risks, the concept of resilience has recently experienced increasing attention in project contexts (Naderpajouh et al., 2020). Managing the variations and unexpected changes through resilience can be a decisive factor in the survival of a project. In addition, projects often span the boundaries of multiple organizations, such as customers, suppliers, service providers, and subcontractors, representing an interorganizational network (Sydow & Braun, 2018). The resilience of projects has increasingly become an interorganizational issue as the number of organizations involved in the project increases and interorganizational relations complicate (DeFillippi & Sydow, 2016).

The process-based view of organizational resilience is classified as (1) readiness and preparedness, (2) response and adaptation, and (3) recovery and adjustment (Bhamra et al., 2011). Readiness and preparedness as a preadversity capability involve detecting weak signals, spotting errors, and anticipating dangers; it is a proactive dimension (Giustiniano et al., 2018). This proactive dimension of resilience reveals the preparation and restoration of resource endowment toward responses that have short- and long-term social impacts on people's lives and businesses (van der Vegt et al., 2015). Response and adaptation, as the dimension of in-crisis organizing capability, involve absorbing shock, reducing loss of function, and improvising and remaining flexible (Vit, 2011). Recovery and adjustment as the

postcrisis capability involve adjusting to the circumstances and rebuilding primary functions as early as possible. The response and adaptation and recovery and adjustment dimensions are adaptive dimensions (Giustiniano et al., 2018) that allow organizations to strengthen and become more resourceful (Sutcliffe & Vogus, 2003). However, some even argue that organizational resilience involves more than just bouncing back to the previous status, but becoming stronger and helping organizations to be better prepared for subsequent adversity (Williams et al., 2017).

Organizational response to adversities in IOPs is significantly affected by the collective level of cognitive and affective capabilities and their institutional environment. Institutional logic is defined as a "socially constructed, historical pattern of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality" (Thornton & Ocasio, 1999, p. 804). Institutional misfits (e.g., public and private sectors) among stakeholders prior to adversity and the presence of diverging institutional logics during organizational recovery and response may lead to disasters (Naderpajouh et al., 2018). However, stakeholders' distributed attention structures and divergent institutional demands that threaten their cognitive and relational aspects have not been fully considered in earlier studies of IOPs.

3.2 Cognitive Elements: Collective Mindfulness

Mindfulness addresses the quality of attention (Weick & Sutcliffe, 2006) and describes enhanced and receptive attention to, and awareness of, the current experience or present reality (Brown & Ryan, 2003) from the individual to a collective level (Yu & Zellmer-Bruhn, 2017). Collective mindfulness is not an aggregate of individual mindfulness, but an emergent shared state of mind (Marks et al., 2001). Collective mindfulness in projects is defined here as a shared belief among project stakeholders where project interactions are characterized by awareness and attention to present events and by experiential, nonjudgmental processing of within-project experiences (Yu & Zellmer-Bruhn, 2017). Collective mindfulness consists of two elemental dimensions: (1) attention to and awareness of the

present; and (2) receptive, open, and nonjudgmental experiential processing (Davidson & Kaszniak, 2015; Good et al., 2016; Yu & Zellmer-Bruhn, 2017).

The attention dimension centers on the present in a sustained and concentrated manner (Brown & Ryan, 2003), which originates from classic Buddhist accounts of mindfulness (Quaglia et al., 2015). Integrating the terms attention and awareness is critical for describing mindfulness, since attention by itself only describes a focused manner without meta-awareness—an apprehension of the current state of the mind that monitors focused attentiveness (Dreyfus, 2011). The present moment refers to ongoing events: present issues that do not belong to the future or past (Smallwood & Schooler, 2015). Sustained and concentrated attention explains the deliberate and purposeful manner of attention (Yu & Zellmer-Bruhn, 2017). The processing dimension emphasizes receptive, open, and nonjudgmental information processing (Weick & Sutcliffe, 2006), reducing conceptual and discriminatory awareness. Receptiveness reveals the

nonreactive nature of perception (Good et al., 2016), whereas openness reflects the Buddhist origins of mindfulness as an open-minded curiosity and compassionate intent (Weick & Putnam, 2006). Nonjudgmental processing is also experiential processing and treats the facts as observed rather than with immediate judgment (Good et al., 2016).

Collective mindfulness facilitates members staying focused and discussing only phenomena, facts, ideas, and opinions (Marks et al., 2001). Collectively concentrating on the present moment involves interpretive work directed at weak and small signals and is often omitted in conceptual information processing (Weick et al., 1999), which is critical for responses in IOP crises.

Founded on the literature on the attention-based view, collective mindfulness, and organizational resilience, we propose in Figure 2 a theoretical framework that reflects our current understanding of organizational resilience of IOPs in the presence of institutional complexities.

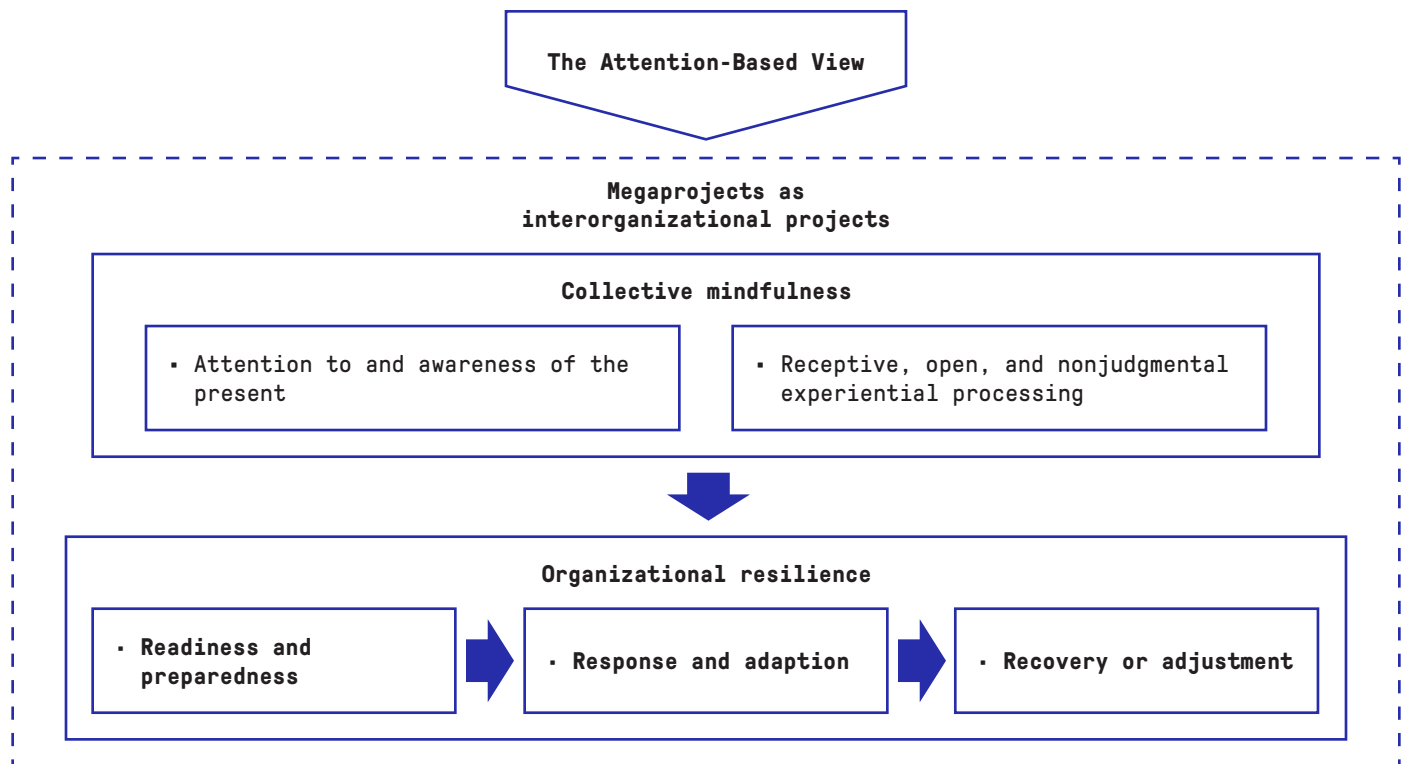


Figure 2. Collective mindfulness and organizational resilience.

3.3 Relational Elements: Prior and Governed Ties

Projects as temporary organizations are affected by the experienced past and expected future of involved organizations (Engwall, 2003). At project commencement, stakeholder organizations are involved in the project. Due to prior ties established before this project commencement, there may be certain relationships among stakeholders such as long-term repeated ties and cooperative experiences. Prior ties signal the continuation of the relationship, breed trust, reduce opportunistic behaviors, improve routines among parties, and promote contractual compliance.

Project governance has been discussed as external to any specific project (project management office or organizational levels) and as internal to a specific project (project level) (Ahola et al., 2014) in terms of different research scopes of project governance. In the latter, the specific project is considered to be a temporary organization that is able to establish a shared set of “rules of the game” that all organizations (stakeholders) participating in the project are expected to follow through project governance. This interorganizational governance perspective is the focus of this research (Ahola et al., 2014; Benítez-Ávila et al., 2018; Haq et al., 2019). The nature of interorganizational relationships is put in place in the governance structure consisting of shared coordination, control, and relational norms to align the interests of all organizations for the joint goal of the project.

The project governance literature, in line with transaction cost economics, suggests that two main types of governance (contractual and relational) are at play in interorganizational relationships (Poppo & Zenger, 2002). Contractual governance highlights the importance of formal contracts to safeguard against opportunism, which may explicitly stipulate outputs to be delivered, monitoring procedures, and detail rights

and responsibilities (Ryall & Sampson, 2009). Meanwhile, relational governance relies on informal structures to mitigate exchange hazards; trust and relational norms are two of the most frequently discussed types (Ferguson et al., 2005). Contractual and relational governance are often simultaneously used in business transactions; thus, there is considerable debate on their mutual relationship, broadly divided into substitutable and complementary groups (Poppo & Zenger, 2002).

Formal contracts in IOPs have been indispensable developed during project commencement (Musawir et al., 2020). Clearly articulated terms, including outputs to be delivered, monitoring procedures, punishment, and details of rights and responsibilities, help reduce information asymmetry and support a fair organizational climate (Ahola et al., 2014). These terms may also inspire the confidence of cooperative organizations in the project (Poppo & Zenger, 2002). Formal contracts increase mutual understanding and improve trust, thereby facilitating the development of relational governance (Benítez-Ávila et al., 2018). Some contractual terms even define the obligation to cooperate in times of crisis. The formal contract operates as a point of reference for encouraging the development of informal relational norms, paving the way for the development of relational governance. Additionally, although relational governance allows cooperative organizations to learn from the project to refine their contracts in the future, the sequential relationship between contractual and relational governance should be highlighted in a temporary and unique project, differing from repeated transactions in manufacturing settings.

In summary, the literature review identified the relationships between cognitive elements (collective mindfulness) and relational elements (prior and governed ties) for organizational resilience. These relationships form the basis for further investigation on the resilience of IOPs under institutional complexity.

4. Methods

The study was carried out in four steps:

4.1. Literature Review

We conducted a literature review following steps recommended by two sources (Briner & Denyer, 2012; Booth et al., 2012). Our literature review proposed an evidence-based categorization for dimensions of project resilience. This step deepened our understanding of what it means for project resilience. The literature review results provided the theoretical base and guided the conceptualization of the subsequent studies.

4.2 Qualitative Data Collection and Analysis

We conducted two rounds of qualitative data collection and analysis for RQ2 and RQ3.1. For the first round, we focused on cognitive aspects—collective mindfulness and resilience, and theorized resilience from a three-stage process view of readiness and preparedness, response and adaptation, recovery, and adjustment. We followed Saunders et al. (2007) and sequentially chose the underlying philosophy, research approach, research strategy, methodological choice, time horizon, techniques, and procedures. The philosophical stance chosen was that of critical realism. We chose abductive reasoning as our research approach (Alvesson & Skoldberg, 2009) to develop new or extend existing theory. Given that organizational resilience is only observed when adversities and crises prevail, the crisis was adopted as the embedded unit of analysis for each case (Yin, 2013). Data analysis follows the framework provided by Miles et al. (2014). Two megaprojects in China were chosen for the study with specific subevents or factors: Project A: Subsea Tunnel (a1 pollution, a2 demolition, a3 technical) and Project B: Intercity High Speed Train (b1 weather, b2 demolition, b3 construction). A longitudinal comparative study was conducted to gain a more holistic understanding of the phenomenon through an in-depth investigation of two different

project settings (Baxter & Jack, 2008). Among 16 interviewees, there was only one female; the other interviewees were male. The interviewees' ages ranged from 28 to 52 years (mean = 36.8 years), with tenure from two to 10 years (mean = 4.5 years) in their current positions, including project manager, associate project manager, safety manager, and government official. The interviews were carried out by a team of two to six researchers, with one leading the conversation while the rest of the team took notes. The interviews ranged from 45 to 120 minutes and were recorded with the interviewees' approval.

For the second round, we followed a similar process but with a different theoretical focus and new rounds of interviews. The theoretical focus was on the relational aspects, including prior and governed relationships and resilience. The interviews were conducted on Project A: Subsea Tunnel and Project B: Intercity High-Speed Train. Hence, the second round of interviews targeted the following events for project A: *A1 Pollution*, *A2 Demolition*, *A3 Technique*; and project B: *B1 Financing*, *B2 Payment*, *B3 Weather*. The second round of interviews involved 18 interviewees. Among these interviewees, there were only two females; the other interviewees were male. The interviewees' ages ranged from 28 to 50 years (mean = 37.1 years). Their current positions included project manager, associate project manager, safety manager, government officer, and project engineer. The interviews ranged from 45 to 120 minutes and were recorded with the interviewees' approval.

4.3 Quantitative Data Collection and Analysis

A web-based questionnaire was distributed to the selected sample projects from the China Business Executives Academy database, where Chinese project managers of large-scale engineering projects of state-owned companies from around the world are trained. The survey was conducted from September 2019 to December 2020. We sent online survey links to 680 project managers to participate in the study.

The questionnaire was divided into two sections to minimize the effects of common method bias. A total of 496 responses qualified for statistical analysis, indicating a response rate of 73%. Our final sample consisted of civil and transportation engineering projects (193 projects, 39%), building projects (109 projects, 22%), city and metro projects (38 projects, 8%), and hydraulic and power engineering projects (156 projects, 32%).

These steps were complemented with additional theory development. An integrated understanding from the results of the four studies (one literature review, two qualitative, and one quantitative investigation) formed a theoretical framework of maximizing the resilience of IOPs under institutional complexity. Section 5 summarizes the results, which were further interpreted toward a practitioner-ready framework and guidelines for governance for the resilience of IOPs.

5. Results and Discussion of Findings

5.1 Conceptualization of Resilience of Interorganizational Projects

Based on the literature review, we conceptualize resilience of IOPs as *the process by which the stakeholders of projects proactively and reactively stand against undesirable setbacks prior to, during, and following adversity, and return to their original state or a new, innovative, and more desirable state.*

First, this definition includes the dual perspective of **proactive and reactive** resilience (Giustiniano et al., 2018), which emphasizes the importance of stakeholder engagement for the resilience of IOPs. Proactive resilience refers to the cultivated preparedness to cope with surprises and the ability to view adverse incidents as sources for opportunity and growth. Reactive resilience refers to the ability to bend and not break and to appreciate, transform, and utilize knowledge for adaptive purposes (Giustiniano et al., 2018).

Second, we conceptualize the resilience of IOPs as a process-based capability and acknowledge the **process nature of resilience** (Williams et al., 2017). Here, *prior to adversity* refers to readiness and preparedness, which involve detecting weak signals, spotting errors, and anticipating dangers (Giustiniano et al., 2018). *During adversity* refers to response and adaption, which involves absorbing shock, reducing loss of function, and improvising and remaining flexible (Vit, 2011). *Following adversity* refers to recovery or adjustment, which involves adjusting to the circumstances and rebuilding primary functions as early as possible.

Third, our conceptualization emphasizes the **recovery and emergence to be even stronger after setbacks**. This requires an implementation of lessons learned, which makes projects stronger after having a “near-death” disruption. Project stakeholders need to see and digest failure as a form of helpful feedback.

The proposed definition implicates many related constructs, including agility, anticipation, flexibility, improvisation, robustness, adaptability, redundancy, and healing (Linnenluecke, 2015; Thomé et al., 2016; Giustiniano et al., 2018). These constructs are closely related to the resilience of IOPs and emphasize the importance of joint problem-solving for improved resilience. The review results indicate also that the cognitive and governance aspects of the resilience of IOPs have not been adequately addressed (Mandal, 2014), while their importance is overtly emphasized (Williams et al., 2017).

5.2 Mechanisms of Collective Mindfulness for Resilience

Our research findings unpack the mindfulness mechanisms as cognitive and emotional endowments that contribute to the process of organizational resilience. In IOPs, adversities that include routine hardships and surprisingly discontinuous events (Kahn et al., 2018) are extenuated by conflicting institutional logics. Diversified project stakeholders’ conflicting and competing institutional logics may worsen, intensify, or blur how adversities influence IOPs (Qiu et al., 2019). Collective mindfulness offers a cognitive and emotional response to adversities, which further influences the readiness and preparedness, response and adaption, and recovery and adjustment stages of organizational resilience. As shown in Figure 3, the mechanisms through which collective mindfulness affects organizational resilience as a process are **awareness allocation, emotional detachment, and attention alignment**. These mechanisms enhance the quality of the project stakeholders’ attention in the face of crises. The cognitive and emotional levels of mindful organizing alleviate the negative impacts of institutional complexities, including endogenous factors that drive relationship conflicts, such as ambiguous contracts and opportunistic behaviors, enabling behavioral and relational responses to adversities and organizational resilience of IOPs.

Awareness allocation is a mechanism adopted throughout a project life cycle, but it only manifests itself and functions prior to, or in, the early stages of a crisis. The awareness allocation mechanism of collective mindfulness improves organizational resilience of IOPs by identifying early signals that are hidden and scattered among different organizational processes.

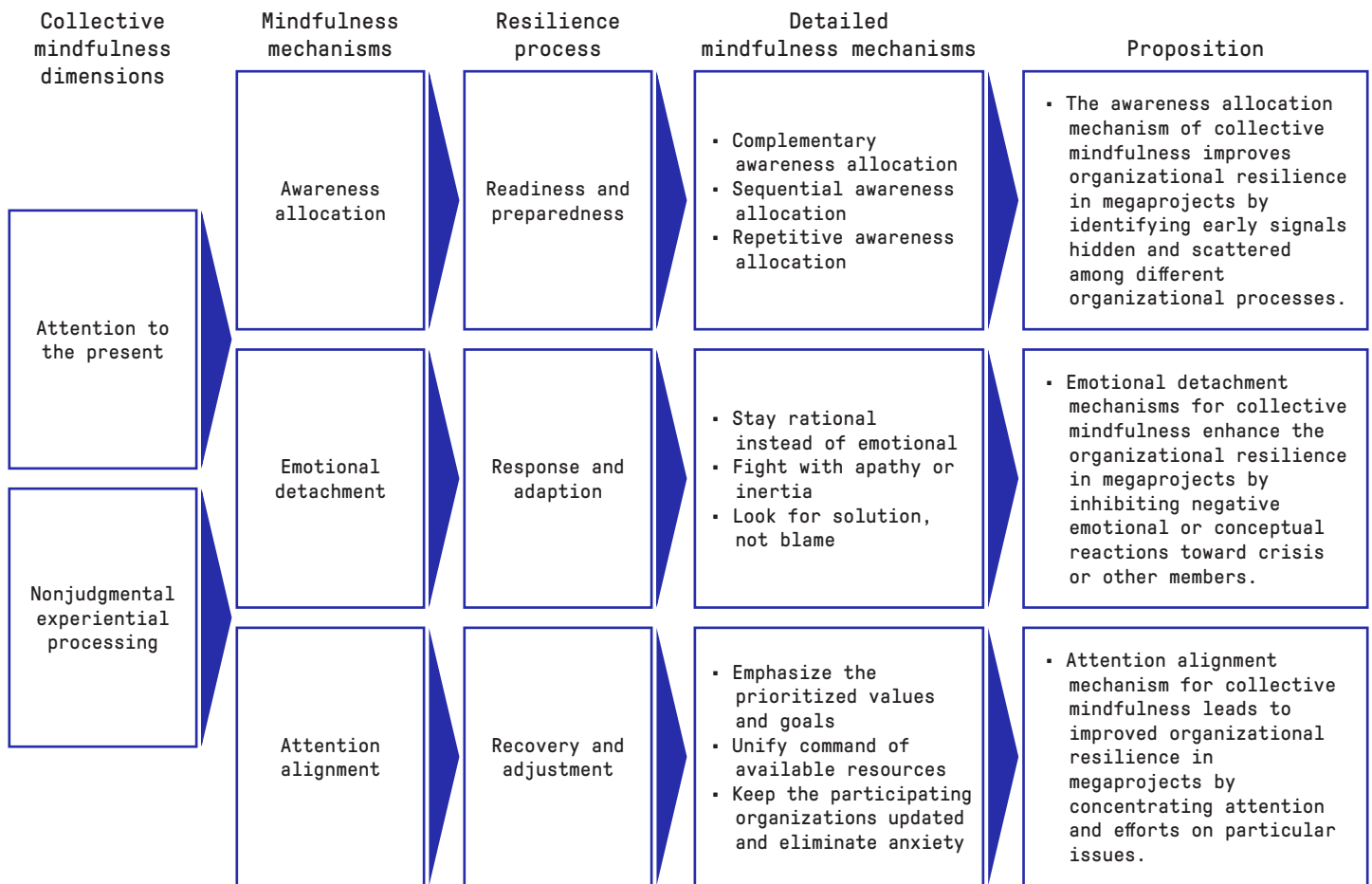


Figure 3. The summarized collective mindfulness mechanisms in organizational resilience.

The awareness allocation mechanism can be established by sharing previous experiences, collectively identifying the critical events and risky spots, assigning attention tasks to involved stakeholders, and forming a comprehensive attention structure for issues and adversities in IOPs.

Emotional detachment is a mechanism applied in the response and adaption stage of organizational resilience and refers to stakeholders detaching from an emotional reaction to remain calm during a crisis. Emotional detachment mechanisms for collective mindfulness enhance IOP organizational resilience by inhibiting negative emotional or conceptual reactions to crises or other members. Emotional detachment can be formed by focusing on the issues and problems, setting aside personal attitudes, avoiding immediate judgment of the situation or criticizing others, and maintaining a harmonious atmosphere even in the face of adversity.

Attention alignment refers to unifying and concentrating the attention of project stakeholders to focus organizational awareness in the intended direction. Attention alignment mechanisms for collective mindfulness improve organizational resilience of IOPs due to concentrated efforts and attention to particular issues. Attention alignment can be formed by emphasizing the prioritized values and unifying the command of available resources, as well as keeping involved stakeholders updated to eliminate their anxiety.

5.3 Mechanisms of Project Governance for Resilience

This study has also explored the mechanisms behind the process where the stakeholder relationships support the resilience of IOPs. In Figure 4, we focus on the interorganizational relationship formed in the past and governed in the present project. We have identified the mechanisms of project governance for the resilience of IOPs.

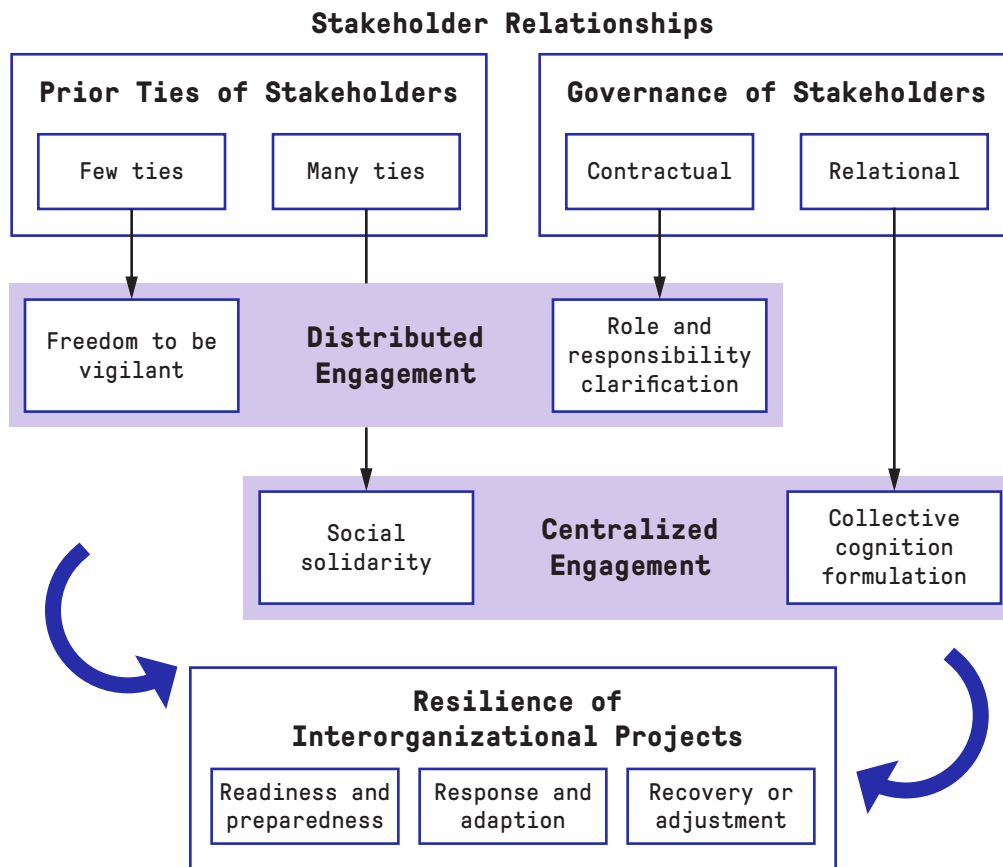


Figure 4. Model of stakeholder relationships and resilience of interorganizational projects.

In the face of a crisis, few prior ties among stakeholders can keep **stakeholders vigilant**, which is conducive to the resilience of IOPs during readiness and preparedness. In the face of a crisis, many prior ties among stakeholders can keep stakeholders in **social solidarity**, which is conducive to the resilience of IOPs in the response and recovery stages.

Across the stage of precrisis preparation, in-crisis response, and postcrisis recovery, both contractual and relational governance in IOPs can improve resilience. The contractual governance improves resilience of IOPs through **clarifying roles and responsibilities** of stakeholders, whereas relational governance improves resilience of IOPs through **forming collective cognition** among stakeholders. Moreover, governance design based on prior ties among stakeholders can dynamically promote distributed and centralized stakeholder engagement in preparing, responding, and recovering from the unexpected to improve resilience of IOPs.

The resilience of IOPs calls for agile mobility and involvement of external stakeholders, which is provided by dynamically distributed and centralized engagement

of external stakeholders. **Distributed engagement** refers to a decentralized stakeholder organizing strategy where project stakeholders are configured and scattered to gain attention, diversification, and risk spreading. **Centralized engagement** is an ordered and concentrated stakeholder organizing strategy that allows project stakeholders to reach solidarity and alignment of goals and means.

By comparing the results of each case analysis, we can merge the mechanisms of prior ties of stakeholders and interorganizational governance on resilience into a model, as shown in Figure 4. Although the number of prior ties among stakeholders can promote the development of project resilience to varying degrees, they cannot fully improve resilience. Contractual and relational governance in the project can promote the entire resilience process by different mechanisms. Hence, many ties, few ties, contractual, and relational governance function differently for stakeholder engagement. Building on findings in these sections, we take a step further and group four mechanisms into two sets of stakeholder engagement strategies to facilitate our understanding of how stakeholders are mobilized

prior to, during, and after the crisis. The two strategies are distributed engagement and centralized engagement.

5.4 Relationships Between Project Governance and Resilience

To assess the relationship between project governance and resilience of IOPs, our analysis took a dynamic capability perspective and incorporated resource reconfiguration for path validation.

We undertook a quantitative analysis using Statistical Product Service Solutions (SPSS) and analysis of a moment structures (AMOS) for the proposed model in Figure 5, which resulted in (1) a partial mediating effect of resource reconfiguration between relational governance and IOP resilience, (2) a full mediating effect of relational governance between contractual governance and resource reconfiguration, and (3) the sequential mediating effect of relational governance and resource reconfiguration between contractual governance and IOP resilience. The robustness of these results was validated through alternative analyses using SmartPLS (Version 3.0).

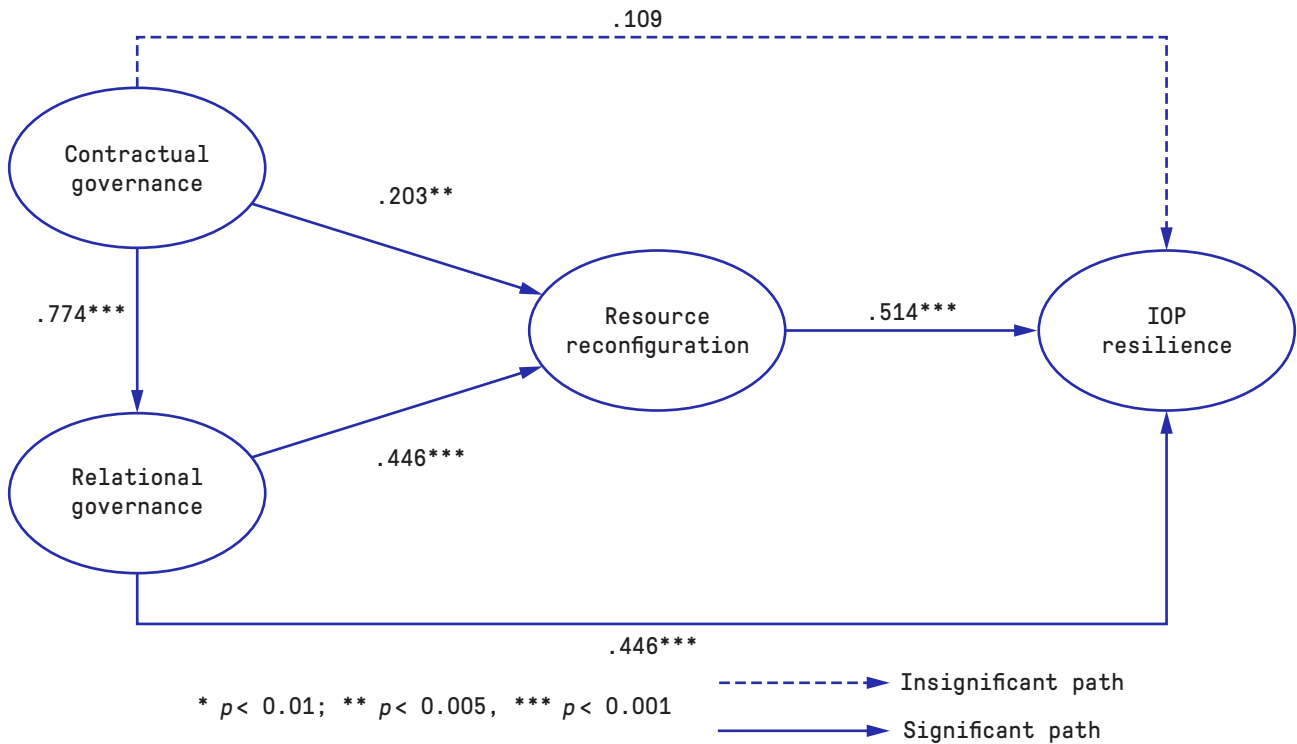


Figure 5. Standardized estimated path model.

Note: The numbers in the figure indicate the standardized parameter. The standardized parameter estimate predicts the change in the response variable (in standard deviations) for one standard deviation of change in the explanatory variable. The relative strength of each path are indicated by these standardized parameters, e.g., the path from relational governance to resource reconfiguration is significantly positive ($\beta = .446, p < 0.001$).



6. Practical Application of the Findings

Our research has several implications for practicing managers.

Resilience requires both proactive and reactive moves and realizes before, during, and after adversities. The project managers need to focus on both being proactive and reactive in the face of adversities. Cost-effective risk management will require balanced strategies to address the opportunities and minimize the likelihood and consequences of potential, undesirable, and disruptive events proactively and reactively. Always remember: Organizations perform risk management to support the project, not the other way around. In addition: Fail fast, fail cheap, and fail small. These trial-and-error strategies are healthy since these mistakes allow you to survive in the face of crises.

Focus on both core and peripheral stakeholders. The research outlined the cognitive and emotional strategies that project managers can utilize to coordinate stakeholders' pre-, during, and postadversity capabilities. Project stakeholders—including not only those directly affected but also peripheral stakeholders—are advised to pay distributed attention to critical events. Both core and peripheral stakeholders, including the main contractor, subcontractors, government, and suppliers, should be coordinated and organized for collective effort in the face of internal and external adversities. Assigning mindful attention using complementary, sequential, or repetitive methods can increase the ability to discern early warning signs. Stakeholders can collectively identify and interpret procedural, factual, and contextual abnormalities to minimize the development of adversities by, for example, highlighting risks that are identified collectively by different stakeholders. Keeping stakeholders emotionally detached at the collective level can also be actively used to organize collective responses and adaption as growing strains and crises unfold. This strategy should be adopted, especially when the crises involve both the public and private sectors by,

for example, avoiding immediate blaming and conflicts during crises. Separating negative personal and relational emotions from the collective response to adversities facilitates surviving both risks and uncertainties. The efficiency and effectiveness of recovery from crises are subject to the aligned attention of stakeholders. Under extenuating circumstances, projects must keep stakeholders mindful, strive to create a “no-blame culture,” and proactively assign an emergency team for crises. Project managers should emphasize their collective priorities, unify the command of tangible and intangible resources, and keep stakeholders informed to improve mindful organizing.

Build resilience by “wasting time” with stakeholder relationships. The findings indicate that project managers or members of the project board and/or project management office should focus on developing close relationships with stakeholders to improve resilience. Managers who intend to promote resilience should not only focus on technical aspects but also pay attention to the relationships among stakeholders. The resilience of a project does not rely on any single stakeholder but depends on the collective response that arises from a synergized and coordinated group of project stakeholders. The time “wasted” in developing stakeholder relationships will be paid back in the face of adversities.

Keep diverse resources available to cope with unexpected events. The achievement of organizational resilience requires resources (human, physical, infrastructure, and financial) that are necessary for the system to function, in addition to the resources that are needed to deliver projects. Project managers should focus on the preparation and allocation of resources and the reconfiguration of available resources to keep the project running. As for some critical resources, project managers should also make some prearrangements to ensure the availability of resources that can be configured during crises. Project stakeholders can make the most of their resource deployment pertaining to the actual need caused by a disturbance.

Make the most of trust and social norms. Managers should create a context of trust and focus on relational norms among stakeholders as key stimulants for collective response in times of crisis. The commitment of stakeholders formalized in contractual agreements

requires a close relationship among stakeholders to take place; otherwise, the impact of economic incentives on stakeholders might weaken during adversities. A contract with terms on *force majeure* is conducive to resilience. However, frequent information sharing, flexible relationships, solitary awareness, and trust among stakeholders are a must since they bring stakeholders together to reconfigure resources. This also applies to gaining public trust, which is extremely important to the success of large projects.

Pay attention to prior ties and governance mechanisms of stakeholders. The general contractor of large projects should pay attention to selecting subcontractors and other stakeholders before the project initiation to investigate their prior ties. Project partners should be governed with plural mechanisms but with a contingent focus according to their prior ties. For example, for project partners who know each other well, contract-dominant approaches should be adopted to allow partners to clarify their roles and responsibilities and to identify potential risks related to themselves. For those partners who are not familiar with each other, relational norms and trust should be adopted to reduce

potential opportunistic behaviors and achieve the collective response in a crisis and quick postcrisis recovery.

Use plural governance design, with contracts, relational norms, and power. The goal of the plural governance design based on prior ties is to allow stakeholders to be dynamically distributed and have a central involvement in preparing, responding to, and recovering activities. Dynamic distribution and centralized engagement are recommended for stakeholders to achieve flexibility and solidarity simultaneously. This is particularly relevant when partners must invest collaborative efforts to handle technological, ecological, financial, and social disruptions. However, contracts and relational governance might not be adequate for joint problem-solving. Governance measures with power, such as hierarchical governance through metaorganizations, can complement when dealing with complexities and adversities. Utilizing digital platforms, for example for supplier management, to enhance the resilience of IOPs can be feasible since it facilitates a plural design of governance mechanisms.

7. Conclusion

The study provided new insights into maximizing the resilience of IOPs under institutional complexity. By conducting a sequential qualitative–quantitative investigation, we can now answer the following research questions:

RQ1: What is organizational resilience of interorganizational projects?

We conceptualize resilience of IOPs as the process by which the stakeholders of projects proactively and reactively stand against undesirable setbacks prior to, during, and following adversity and return to its original state or a new, innovative, and more desirable state. Unlike metric or holistic perspectives, resilience of IOPs emphasizes an organizational perspective and a stakeholder focus.

RQ2: How does collective mindfulness facilitate organizational resilience in the context of interorganizational projects?

Three mechanisms through which collective mindfulness impacts organizational resilience were identified: (1) awareness allocation, (2) emotional detachment, and (3) attention alignment. The awareness allocation mechanism of collective mindfulness is enacted during the precrisis period, where readiness and preparedness for organizational resilience are applied. The emotional detachment mechanism of collective mindfulness is enacted during the in-crisis period when response and adaption of organizational resilience occur. The attention alignment mechanism appears during the postcrisis period when recovery and adjustment through organizational resilience are performed.

RQ3.1: How do prior ties among stakeholders and governance design in the interorganizational project support its resilience?

To address this research question, the study explored the mechanisms behind the process through which stakeholder relationships support the resilience of IOPs. We focused on the interorganizational relationship formed in the past and governed in the present project. Regarding the research question, few prior ties among stakeholders foster the preparedness phase in the resilience framework through keeping stakeholders vigilant, while many prior ties foster the response and recovery phases in the resilience framework through keeping social solidarity among stakeholders. Contractual governance in an IOP improves the whole framework of its resilience by clarifying the roles and responsibilities of stakeholders, while relational governance fosters the whole framework of resilience by forming collective cognition among stakeholders. Overall, the stakeholder relationships should be appropriately developed by a pluralistic governance design based on prior ties, enabling stakeholders to be dynamically distributed and centralized engagement in the preparation, response, and recovery from the unexpected for enhancing the resilience of IOPs.

RQ3.2: How do interorganizational relationships impact the resilience of interorganizational projects?

This study aimed to investigate the impacts of contractual and relational governance on IOP resilience and unpack the underlying mechanisms. By conducting a quantitative analysis of a sample of 496 projects from the engineering industry in China, the research questions were answered. Our findings indicate that contractual and relational governance can contribute to IOP resilience. Resource reconfiguration among stakeholder organizations plays a mediating role in the relationship between contractual and relational governance and IOP resilience. In addition, relational governance and resource reconfiguration sequentially and fully mediate the relationship between contractual governance and IOP resilience. That is, contractual and relational governance develop resilience through resource reconfiguration, thereby assuring proactive and reactive responses to crises for IOPs.

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Appendix B: List of Outputs

Journal Papers

Wang, L., Müller, R., Zhu, F., & Yang, X. (2021). Collective mindfulness: The key to organizational resilience in megaprojects. *Project Management Journal*, 52(6), 592–606.

Wang, L., How does governance of inter-organizational projects develop resilience: The mediating role of resource reconfiguration. Manuscript in preparation.

Wang, L. Organizational resilience in temporary organizations: A literature review. Manuscript in preparation.

Yang, X., Wang*¹, L., Zhu, F., & Müller, R. (2022). Prior and governed stakeholder relationships: The key to resilience of inter-organizational projects, *International Journal of Project Management*, 40(1), 64–75.

Conference Papers and Book Chapters

Wang, L., Zhang, C., & Zhu, F. (2021, September 18–19). Supplier governance of inter-organizational projects from the perspective of institutional logic: The evidence from supplier management system of China Communications Construction Company. *Smart City and Intelligent Construction Conference*, Wuhan, China (in Chinese) [Best Conference Paper Award].

Wang, L., & Zhu, F. (2021). Attention and mindfulness: A tale of two megaprojects. In N. Drouin, S. Sankaran, A. van Marrewijk, & R. Müller (Eds.), *Reflections on personal life stories: New horizons in organization studies* (pp. 47–61). Edward Elgar Publishing.

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