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UNVEILING THE BUFFERING ROLE OF PRIOR TIES IN RELATIONSHIP CONFLICT MANAGEMENT IN THE CONSTRUCTION INDUSTRY

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Abstract. Relationship conflict is commonplace during the cooperation period between the general contractor and subcontractor. However, how to prevent the adverse effect arising from relationship conflict on the final project outcome is scarce, especially in empirical studies. Drawing on the conservation of resources (COR) theory, a theoretical model revealing the underlying deteriorating mechanism (relational behavior) and corresponding prevention strategies (prior ties) is developed. Based on 174 questionnaires collected from the Chinese construction industry, the model and proposed hypotheses are empirically examined. The results suggest that relationship conflict between the general contractor and subcontractor harms cooperation performance, and relational behavior mediates this relationship. If the general contractor and subcontractor have a prior cooperative relationship, the devasting impact of relationship conflict can be undermined. These findings deepen the understanding of the underlying mechanism by which relationship conflict impairs the final cooperation performance and afford insights into relationship conflict management from a pre-prevention perspective.

Keywords: relational behavior, relationship conflict, conservation of resources (COR) theory, prior ties.

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1. Introduction

Due to technical, economic, or risk issues, general contractors in the construction industry often subcontract part of their work to technical and labor subcontractors (Martin & Benson, 2021; Tan et al., 2017). Commonly, subcontracting could complement the general contractor's insufficient competence, improve economic benefits and transfer potential risks, which in turn contributes to successful project delivery. However, in subcontracting practices, interdependence between the general contractor and subcontractor is formed and conflict usually occurs between the two parties, which is regarded as a significant setback in cooperation performance (Lee et al., 2017; Mahamid, 2017).

Existing theories and empirical evidence both suggest that, compared to task conflict, relationship conflict can induce more negative consequences (De Dreu & Weingart, 2003; Shaukat et al., 2017). This study thus focuses on relationship conflict, which refers to incompatibility between the general contractor and subcontractor and manifests as a sense of tension, anger, hostility, discomfort, and other negative emotions. Although previous studies have confirmed a direct negative effect of relationship conflict on project performance (i.e., cost, schedule, and quality) (Chen et al., 2014; Iyiola & Rjoub, 2020; Vaux & Kirk, 2018), the underlying mechanism has not been fully investigated, which is believed to be necessary for the following reasons. Relationship conflict is emotional, whereas project performance is task-oriented. Therefore, the spillover from the emotional aspect to the task aspect is not immediate but a process. In addition, while scholars have stressed the importance of conflict management behavior, the recom-

mended behavior, such as integrating and compromising, is vague for construction managers as they provide little practical guidance (Al-Sibaie et al., 2014; Chen et al., 2014). By investigating the underlying mechanism (also intermediate outcome), specific conflict management strategies could be put into effect before cooperation performance (final outcome) deteriorates. This study is thus motivated to explore how relationship conflict between the general contractor and subcontractor influences cooperation performance.

According to the conservation of resources (COR) theory, the relationship between the general contractor and subcontractor is to establish resource caravans, thus smoothly exchanging resources to complete the project and achieve expected goals. The general contractors and subcontractors seek to maximize their resources to deal with unexpected situations as well as avoid negative situations that might result in resource loss. To prevent further resource losses, both parties may choose to avoid feedback and refrain from investing energy into spontaneous reciprocal behavior. According to the primacy of loss principle in the COR theory, when relationship conflict occurs, the initial loss of relationship resources makes them perceive the harm of losing such a friendly relationship to be greater than the benefit of regaining the lost resources. Both parties believe that they can not acquire the intended resources from such an exchange relationship. Resource caravans in conservation of resources theory suggests once their expectations for resource exchange are hampered, the consequent resource exchange behavior will be diminished, thus exhibiting a loss spiral pattern, In this case, as a typical kind of intangible resource, relational behavior is believed to be negatively influenced by relationship conflict. As both parties continue to decrease relational behavior, they share less critical information and their relationship becomes increasingly rigid, which will ultimately impede cooperation performance. As a result, relationship conflict may negatively influence cooperation performance by relational behavior.

It is noted that resource exchange between the general contractor and subcontractor can be classified as short-term and long-term. For strategic concerns, the general contractor will selectively establish long-term exchange relationships with several subcontractors, these relationships markedly impact the initial phases of project implementation (Lee & Chong, 2021; Valdés-Ilaneza & García-Canal, 2015). The accumulated experience and mutual knowledge among team members lead to the formation of social connections and resources, termed as prior ties in this study (Buvik & Rolfsen, 2015). Resource caravans suggest resources tend to generate other resources (Agarwal & Anantatmula, 2023). When the two parties have prior ties, they tend to adopt a long-term cooperation perspective to deal with short-term relationship conflict. Therefore, it is contended that prior ties could buffer the link between relationship conflict and cooperation performance.

In summary, this study attempts to answer the following two questions:

- How can relational behavior mediate the link between relationship conflict and cooperation performance between the general contractor and the subcontractor?
- How can prior ties change the strength between relationship conflict and relational behavior?

The remainder of the paper is organized as follows. It begins with a review of the literature on relationship conflict within the construction industry and the Conservation of Resources (COR) theory. Building on this foundation, a series of hypotheses based on the COR theory are developed. This theoretical framework is followed by a detailed description of research methodology and data analysis procedures. Finally, the authors discuss the empirical findings, highlighting both their theoretical and practical implications, and address the limitations of the study.

2. Literature review and theoretical background

2.1. Relationship conflict between general contractor and subcontractor

In construction project teams, the general contractor is responsible for overseeing the entire project and communicating directly with the client or owner, typically assumed to be in a position of authority. Subcontractors perform specific tasks on behalf of the general contractor, they often perceive the general contractor as treating them as subordinates and fail to understand the principles of partnering relationships, even among those with prior successful cooperative experiences (Dainty et al., 2001, 2004; Liu et al., 2017). This hierarchical dynamic can result in power imbalances and overt abuse, often leading to relationship conflict (Chalker & Loosemore, 2016; Manata et al., 2021; Tan et al., 2017). Scholars have pointed out that a prevailing sense of mistrust and skepticism characterizes the general contractor-subcontractor relationship. The literature has emphasized the importance of forging "meaningful relationships" and nurturing "primary social ties" as crucial resources within this context (Jehn, 2015; Öberg et al., 2020). Consequently, relationship conflict is perceived as a typical resource loss (Wang et al., 2012; Wu et al., 2017a).

The extant literature has extensively explored the implications of relationship conflict on construction project performance. However, studies conducted by Wu et al. (2018), Vaux and Kirk (2018), and Liu et al. (2022) have primarily framed relationship conflict as a mediating factor that influences project outcomes. These studies focus on the direct connection between various project characteristics and relationship conflict, and the resultant negative impacts including diminished productivity, prolonged schedules, waning motivation, and decreased profitability (Al-Sibaie et al., 2014; Lee et al., 2017; Liu et al., 2022). Despite these valuable contributions, the immediate con-

sequences of relationship conflict have often been overlooked. This gap in scholarly comprehension regarding the specific effects of relationship conflict in the construction field underscores the existing literature's tendency to neglect the instant aftermath of relationship conflict and its immediate management, thus indicating a critical research deficiency. Our study seeks to bridge this gap by advocating for a more thorough examination of the immediate outcomes of relationship conflict and the formulation of effective management strategies to alleviate its negative impact on project outcomes. By focusing on the indirect consequences, our research endeavors to provide a more nuanced understanding and practical guidance for construction project management.

2.2. Conservation of resources theory

In this study, the conservation of resources theory is employed to derive the hypotheses. This theory suggests individuals or groups are motivated to protect their current resources (conservation) and acquire new resources (acquisition). The COR theory includes two primary principles: the primacy of resource loss and resource investment (Halbesleben et al., 2014; Hobfoll, 1989, 2011). The former principle implies that losses in the workplace will carry a greater impact than gains of equivalent value. People will avoid interaction with other confrontational individual to reduce further resource losses (Pinto et al., 2016). The resource investment principle is usually examined in the context of exploring the coping strategy, suggesting that the coping strategy involves resource investments aimed at mitigating future resource losses (Zhang et al., 2019). COR theory further delineates that the process of resource loss and gain presents a spiral pattern. Over the past decades, this theory has been extended to understand organizational behavior (Scott, 2016; Zhu et al., 2021). Hobfoll (2011) argued that resources exist in caravans. It is the responsibility of organizations, especially through the actions of managers and supervisions, to maximize the ecology that fosters resource caravan enrichment and challenge that promotes excellence. Resource caravan passageways offer a "marketplace" of shared resources, resource stability, and safety of expressing ideas openly and sustain inter-organizational ecologies, thus facilitating resource exchange to meet mutual missions (Hobfoll, 2011).

In the construction project context, since the general contractor and subcontractor are often held accountable for each other, resource sharing in organizations becomes critical (Hinze & Tracey, 1994; Hobfoll, 2011; Liu et al., 2017). Building upon the COR perspective, we infer that resource exchange between the general contractor and subcontractor occurs in resource caravan passageways. Conflict in the general contractor-subcontractor relationship is seen as a significant loss of resources. In line with the primacy of resource loss and the loss spiral principle, we proposed that relationship conflict in turn induces organizational resource losses (Mubarak et al., 2022; Shaukat et al., 2017), specifically through a reduction in relational behavior, ultimately resulting in a further decline of cooperation performance. The COR theory has been widely adopted in the construction field and affords a theoretical perspective for many phenomena in construction projects. Liu et al. (2021) developed a theoretical structural model combined with COR theory to verify the configural impacts of job stressors and psychological needs on employee well-being in Chinese AEC projects. Mubarak et al. (2022) explored the importance of employee's psychological resources in mitigating the adverse effects of psychological distress on project success. Agarwal and Anantatmula (2023) suggested resources generate other resources, thus forming caravan passageways that may result in positive outcomes. They identified psychological capital as an important personal resource that could buffer the negative link between abusive supervision and knowledge sharing in construction project teams. In this way, COR theory is employed as the overarching theoretical framework to deconstruct relationship conflict in construction projects.

3. Hypotheses

3.1. Relationship conflict and cooperation performance

Due to the unequal distribution of power, abuse of authority, and incompatible interests between the general contractor and subcontractor, relationship conflict in the construction industry is unavoidable. Relationship conflict can lead to psychological fatigue for both parties involved in the project, resulting in increased work pressure and decreased productivity. According to the conservation of resources (COR) theory, relationship conflict represents an initial loss of relationship resources, leading to negative emotions, such as frustration, anger, and discomfort between the general contractor and subcontractor (Khosravi et al., 2020; Lumineau et al., 2015; Meng, 2012). The negative emotions make it challenging for them to engage in rational discussion about relationship conflict from a successful project delivery perspective. Consequently, it becomes difficult for both parties to focus their attention on project tasks, increasing the likelihood of rework and ultimately leading to poor cooperation performance (Rau, 2005; Vaux & Kirk, 2018; Wu et al., 2017b). Therefore, the following hypothesis is developed:

Hypothesis 1: *Relationship conflict has a negative impact on cooperation performance*.

3.2. The effects of relational behavior

According to the conservation of resources (COR) theory, relational behavior can be understood as a primary resource that is highly valued by the general contractor and subcontractor. Relational behavior refers to autonomous reciprocal behaviors that reflect inter-organizational mutual interests and a long-term cooperation orientation (Macneil, 1980; Sezen & Yilmaz, 2007). Subsequent research has further developed this concept by incorporating three types of observed relational behaviors, namely flexibility, information exchange, and solidarity (Hoppner & Griffith,

2011; Lu et al., 2020; Zheng et al., 2021). Specifically, flexibility refers to the ability of the two parties to respond and adapt to changing circumstances together. It represents the shared expectation between the two parties regarding their behavior in the face of unexpected changes in the contractual environment (Zhang et al., 2003; Zheng et al., 2018). Informational exchange pertains to the proactive offering of crucial information by one party to another in a timely and accurate manner, thereby safeguarding their cooperative project work. Lastly, solidarity denotes a mutual expectation that inter-organizational behavior is aligned with collective interests, rather than individual interests (Sezen & Yilmaz, 2007).

In the construction industry, the adoption of relational transaction practices by the general contractor and subcontractor leads to improved flexibility. Greater flexibility enables them to respond and adapt to environmental changes more quickly, thus mitigating the negative impact of conflicts (Zheng et al., 2018). Relational behavior also fosters positive cooperative relationships and facilitates the exchange of crucial information. The more information exchanged between the general contractor and subcontractor, the more effectively they can meet each other's needs and utilize integrated expertise knowledge promptly (Akintoye & Main, 2007). Furthermore, when solidarity exists between the general contractor and subcontractor, they can collaboratively resolve problems and gradually develop a solid relationship foundation (Ling et al., 2013). Consequently, by promptly responding to unexpected changes, jointly addressing problems, and facilitating timely information sharing, the two parties can minimize cost and time, achieve higher productivity, and ultimately enhance cooperation performance (Lu & Yan, 2007; Lumineau & Henderson, 2012; Ning & Ling, 2015). Thus, the following hypothesis is proposed:

Hypothesis 2: *Relational behavior is positively related to cooperation performance*.

As Hypotheses 1 and 2 indicated, direct relationships have been established between relationship conflict and cooperation performance, as well as between relational behavior and cooperation performance. We suggest relational behavior plays a mediating role in the link between relationship conflict and cooperation performance. The relevant mechanisms of relationship conflict and relational behavior can be understood in the context of the loss principle of COR theory. According to this principle, relationship conflict leads to friction in a social relationship, which is considered a kind of significant resource loss in construction projects (Shaukat et al., 2017). When faced with relationship conflict, the general contractor and subcontractor cut off some of their social ties. The cohesive social fabric that once bound them begins to unravel, leaving them without the fulfillment of their social needs and disrupting their sense of belonging (Lu & Guo, 2019). Each party will prioritize their interests while disregarding the importance of relational behavior (Eriksson et al., 2008; Ning & Ling, 2013). Initially, the general contractor or subcontractor is more likely to experience tension and depression (Ling et al., 2014; Paulraj et al., 2008). To prevent further resource loss in the relationship conflict, both parties are more likely to engage in the feedback avoidance strategy. In particular, they may fail to value cooperation and seek to avoid interaction with each other (low solidarity). Their ability to respond to circumstance changes will decrease (poor flexibility), and their unwillingness to share information increases information asymmetry (invalid information exchange). Furthermore, relational behavior can be encouraged but not coerced into practice (Ning, 2014; Ning & Ling, 2013; Zheng et al., 2018). In light of these arguments, the following hypothesis is proposed:

Hypothesis 3: *Relational behavior mediates the relationship between relationship conflict and cooperation performance*.

3.3. The effects of prior ties

According to COR theory, organizations with a high level of inter-organizational resources can better handle unexpected situations and prevent negative impacts. Existing resources can generate new resources, which may lead to positive outcomes in inter-organizational cooperation, such as improving organizational collaboration efficiency and addressing external changes (Agarwal & Anantatmula, 2023). Additionally, prior ties have been shown to promote the development of trust between organizations, making them more willing to embrace vulnerability within the relationship and have greater confidence in putting forth their efforts to promote project success (Buvik & Rolfsen, 2015; Lee & Chong, 2021). Focusing solely on the impact of prior ties on organizational trust is insufficient for directly generalizing existing research conclusions to the impact of construction cooperation performance. Lecoutre and Lièvre (2010) emphasized that members in temporary project organizations preferred to establish new relationship networks to expand new external resources. Additionally, Yang et al. (2022) noted that in the absence of prior ties, project teams can communicate more freely and express opinions without hesitation on project-related issues (Burt, 2000). Within a typical temporary project organization, the decision to select a subcontractor with prior ties versus seeking a new partner remains unresolved for the general contractor. Therefore, we explore the potential role of prior ties from the perspective of preventing relationship conflict beforehand.

The COR theory suggests organizational resources lead to resource accumulation and buffering against negative impacts (Agarwal et al., 2021; Hobfoll, 2011). The authors believe that the general contractor and subcontractor with prior ties are more likely to approach relationship conflict with a positive attitude (Chen et al., 2018). This is because they have already accumulated certain relationship resources, and they tend to believe that temporary relationship conflict will be diminished quickly. Additionally, they have a better understanding of each other's styles and approaches when dealing with disagreements, enabling them to assess mutual interests more effectively (Lee & Chong,

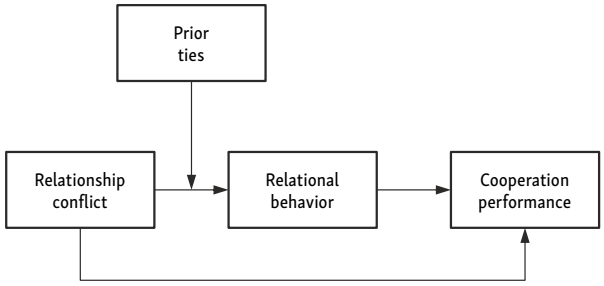

Figure 1. Conceptual model

2021). This, in turn, allows them to flexibly take measures to mitigate the negative impact of relationship conflict. Thus, the following hypothesis is proposed:

Hypothesis 4: *Prior ties moderate the relationship between relationship conflict and relational behavior. Namely, relationship conflict will have greater negative effects on relational behavior when the two parties don't share prior ties.*

The conceptual model is presented in Figure 1.

4. Research methodology

4.1. Data collection

A questionnaire survey was conducted to empirically examine the hypotheses. Construction practitioners have a direct understanding and experience of the relationship with another party, thus constituting the target respondents. To increase the response rate, we adopt a non-probability sampling method, which has been widely adopted in construction management studies (Zhang et al., 2018). To reduce the subjective neutral tendency evident in China, we avoided the middle selection and designed the 6-point scale according to Kalton et al. (1980). In this way, respondents were more likely to choose the answers that are more inclined and reflect the project reality, which is widely accepted in social research (Dalal et al., 2014).

We either sent the questionnaire online or on-site based on several construction-related companies: China Railway Major Bridge Engineering Group CO. LTD, China Construction Eighth Engineering Division Corp., LTD, Taihu New City Group, Bureau of Public Works of Shenzhen Municipality, etc. Also, two of our authors are deeply involved in Chinese infrastructure construction projects, such as the Beijing DaXing International Airport project, Chongqing N.10 Railway Station, etc., they contacted several experienced experts and invited them to help answer the questionnaire. All respondents were asked to answer the questionnaire based on the current project they were working on. To ensure the validity of the results, we first sent our questionnaire to experts, including two professors in the field of engineering management and three senior practitioners who have worked in the construction industry for more than fifteen years. According to their suggestions, we adjusted some items' statements to make them more suitable for the construction context. Then we conducted a pilot study on Master of Engineering Management students from Tongji University School of Economics and Management. These Master of Engineering Management (MEM) students are composed of a group of managers with certain experience in the construction industry, which makes it reasonable to choose them for pre-experiments. A confirmatory factor analysis was conducted and items whose outer loadings are lower than 0.65 were removed (Hair et al., 2019). As such, the final questionnaire was formulated. From Oct. 2022 to Feb. 2023, we received 200 responses, after removing the questionnaires that were completed in less than three minutes and were not answered carefully, 174 valid responses were left. Among these, 96 were obtained online, while 78 were gathered offline. The T-test was conducted on the two samples and found that there were no significant differences in any of the measured indicators between the two samples. As Table 1 shows, the broad data resource guarantees the reliability of the data.

Table 1. Descriptive statistics of sample

Characteristics	Number	Percent
Work Experience		
5 years or less	18	10.40%
6–10 years	109	62.60%
11–15 years	43	24.70%
16–20 years	3	1.70%
20 years or more	1	0.60%
Professional qualifications		
Senior management	16	9.20%
Project manager	65	37.36%
Department manager	21	12.07%
Professional engineer	72	41.37%
Project type		
Building construction	131	75.29%
Infrastructural construction	40	22.99%
Other	3	1.72%
Project progress		
0 < progress ≤ 20%	5	2.87%
20% < progress ≤ 40%	18	10.35%
40% < progress ≤ 60%	96	55.17%
60% < progress ≤ 80%	38	21.84%
80% < progress ≤ 100%	17	9.77%
Contract type		
DBB	139	79.89%
DB/EPC	32	18.39%
Other	3	1.72%
Contract amount [CNY (billion)]		
amount ≤ 0.5	34	19.54%
0.5 < amount ≤ 1	75	43.10%
1 < amount ≤ 10	59	33.91%
10 < amount	6	3.45%
Contract duration [Years]		
duration ≤ 1	25	14.37%
1 < duration ≤ 3	75	43.10%
3 < duration ≤ 5	68	39.08%
5 < duration	6	3.45%

Note: CNY – China Yuan.

4.2. Measurement

This study uses multi-item measurement scales originating from existing literature to ensure the validity of the measures. Several modifications were made to improve the adaptability in the construction field.

Relationship conflict. The relationship conflict was measured by 3 items based on the study by Wu et al. (2017a), since their research context is the construction field, matching the background of this study. We adapted a 6-item scale to capture the relationship conflict in the construction industry.

Relational behavior. We assessed relational behavior by using 3 items developed by Lu et al. (2020), which have been demonstrated to have good reliability and validity.

Prior ties. Based on the method of measuring prior ties from Chen et al. (2018) by the frequency of prior ties (*Very often*, *often*, *seldom*), we expanded the scale to assess whether, how, and how often, providing a more comprehensive understanding of prior ties.

Cooperation performance. Since cooperation performance touches on aspects commonly associated with broader project performance metrics but hones in on the specific project segments each party is contracted to deliver, rather than the project as a whole. It does not directly measure the overall success of the completed construction project. Therefore, we modified the 5-item scale based on the study by Jia et al. (2021) to measure cooperation performance.

Control variables. Drawing upon the research on relationship management in the construction field, we selected project characteristics (project type, project progress) and basic contractual information (contract type, contract amount, contract duration) as control variables (Ning & Ling, 2015; Vaux & Kirk, 2018; Zheng et al., 2021). Both quantitative and qualitative research have confirmed that project complexity is positively associated with the occurrence of relationship conflict, as indicated by project type and contract amount (Kennedy et al., 2017; Suprapto et al., 2016). As projects advance through different stages, tasks become more defined, highlighting issues related to the unequal distribution of risks and resources, which can lead to potential relationship conflict (Lu et al., 2020; Lui et al., 2009; Poppo & Zenger, 2002). The contract type and contract duration also play a significant role in triggering relationship conflict. For example, lump-sum contracts can lead to disputes between the general contractor and subcontractor due to ambiguities in drawings or project specifications, which may only surface during the construction phase (Vaux & Kirk, 2018). In general, project type, contract amount, project progress, contract type, and contract duration are considered as control variables.

4.3. Common method bias

To eliminate potential common method bias, a rigorous method was applied in this research. For example, the questionnaire does not ask for the respondents' private information or project specific names. Also, no wrong and no right answers were communicated to respondents (Imam, 2021). In addition, AMOS version 24 was applied to examine the presence of common method bias. A common method variance (CMV) factor was introduced in the model, with paths leading to each of the indicator variables. The added common method variance (CMV) factor led to improvement in the fit of the model compared to the baseline model (Table 3), χ^2 = 118.277, df = 113, RMSEA = 0.016, CFI = 0.996, TLI = 0.996. The relationship between the latent factors altered slightly, not substantively, which indicates the nonexistence of common method variance. Therefore, common-method bias was not a significant disturbance in this study (Podsakoff et al., 2003).

5. Data analysis and results

5.1. Measurement model results

Confirmatory factor analysis (CFA) was performed to test the model with four constructs. This study applied AMOS 24.0 to analyze the data. Table 2 shows the CFA results. The values of Cronbach's alpha all exceeded 0.8, indicating internal consistency reliability (Fornell & Larcker, 1981). The composite reliability of each construct is greater than 0.7, and the values of average variance extraction (AVE) exceed 0.5, which supports good reliability and validity of all constructs (Agarwal & Anantatmula, 2023). The discriminant validity was tested by comparing models combining different constructs with the baseline. Table 3 indicates that the goodness-of-fit (GOF) of the baseline model was better than that of the other models [χ^2 = 118.277, df = 113, RMSEA = 0.016, comparative fit index (CFI) = 0.996, Tucker-Lewis index (TLI) = 0.996, incremental fit index

Table 2. Results of reliability and validity test

Latent variable	Item	Loading	Cronbach's α	CR	AVE
Relationship conflict	RC1	0.748	0.894	0.898	0.597
	RC2	0.868			
	RC3	0.809			
	RC4	0.772			
	RC5	0.722			
	RC6	0.703			
Relational behavior	RB1	0.878	0.839	0.842	0.641
	RB2	0.801			
	RB3	0.714			
Cooperation performance	CP1	0.751	0.844	0.850	0.533
	CP2	0.699			
	CP3	0.690			
	CP4	0.815			
	CP5	0.687			
Prior Ties	PT1	0.792	0.813	0.823	0.610
	PT2	0.722			
	PT3	0.825			

Note: RC – relationship conflict; RB – relational behavior; CP – cooperation performance, PT – prior ties.

Table 3. Results of the discriminant validity test

Model	c^2	df	c^2/df	RMSEA	SRMR	NFI	IFI	RFI	TLI	CFI
Baseline model	118.28	113	1.047	0.016	0.040	0.926	0.996	0.911	0.996	0.996
Three-factor model	268.25	116	2.313	0.087	0.078	0.833	0.898	0.804	0.879	0.896
Two-factor model	413.69	118	3.506	0.12	0.088	0.742	0.801	0.703	0.768	0.799
Single-factor model	568.25	119	4.775	0.148	0.111	0.646	0.698	0.595	0.651	0.694

Note: Baseline model: Relationship Conflict, Relational Behavior, Cooperation Performance, Prior Ties; Three-factor model: Relationship Conflict + Relational Behavior, Cooperation Performance, Prior Ties; Two-factor model: Relationship Conflict + Relational Behavior + Cooperation Performance, Prior Ties; Single-factor model: Relationship Conflict + Relational Behavior + Cooperation Performance + Prior Ties.

(IFI) = 0.996], thus indicating good discriminant validity (Antia & Frazier, 2001).

5.2. Analytical strategy and hypothesis testing

The PROCESS Macro for SPSS version 24 (Model 7) developed by Hayes (2013) was used to test the mediation and moderation hypotheses. As for the mediating effect, Table 4 shows that relationship conflict has a significant negative influence on cooperation performance (effect size = –0.214, standard error (SE) = 0.073, 95% confidence interval (CI) = [–0.358, –0.070]), thus supporting Hypothesis 1. As predicted, relational behavior is positively related to the cooperation performance (effect size = 0.510, standard error (SE) = 0.072, 95% confidence interval (CI) = [0.367, 0.653]), therefore, Hypothesis 2 is supported. The results show that relational behavior partially mediates the relationship between relationship conflict and cooperation performance (effect size = –0.292, standard error (SE) = 0.057, 95% confidence interval (CI) = [–0.405, –0.184]), the mediating effect accounts for 57.7%, thus supporting Hypothesis 3.

Table 4. Mediating effect of relational behavior

Path	Effect	SE	95% boot CI
RC→CP	–0.214	0.073	[–0.358, –0.070]
RB→CP	0.510	0.072	[0.367, 0.653]
RC→RB→CP	–0.292	0.057	[–0.405, –0.184]
Total effects	–0.506	0.068	[–0.640, –0.372]

Note: CI – Confidence Interval; SE – Standard Error; RC – Relationship Conflict; PT – Prior Ties; RB – Relational Behavior; CP – Cooperation Performance.

As Table 5 shows, prior ties negatively moderate the effect of relationship conflict on relational behavior (effect size = –0.293, standard error (SE) = 0.899, 95% confidence interval (CI) = [–0.471, –0.116]). This suggests that for general contractors and subcontractors who share a history of prior interactions, the detrimental effects of relationship conflict on their relational behavior are comparatively subdued. Consequently, our findings lend empirical support exclusively to Hypothesis 4.

The simple slope analysis was performed on H3 to interpret the moderating effect visually. The dotted line in Figure 2 shows a clear interaction effect. According to

Table 5. Moderating effect

Levels of different types of Prior Ties		Effect	t	SE	95% boot CI
RC×PT		0.212	3.509	0.060	[0.093, 0.331]
PT	High (+1 SD)	–0.293	–3.262	0.899	[–0.471, –0.116]
	Moderate	–0.506	–8.062	0.063	[–0.629, –0.382]
	Low (–1 SD)	–0.718	–8.512	0.084	[–0.885, –0.551]

Note: CI – Confidence Interval; SE – Standard Error; RC – Relationship Conflict; PT – Prior Ties.

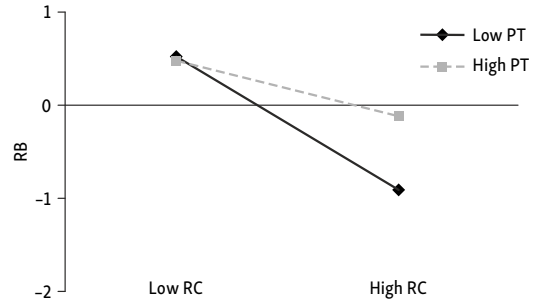

Figure 2. Slope analysis of prior ties
(RC – Relationship Conflict, RB – Relational Behavior, PT – Prior Ties)

Figure 2, when the general contractor and subcontractor have prior ties, the negative effect of relationship conflict on relational behavior is weakened.

5.3. Supplementary analysis

Extant literature suggested that the existence of prior ties could lead to better project performance (Buvik & Rolfsen, 2015; Lee & Chong, 2021). The authors did not find direct evidence for the moderating effect of prior ties on the link between relationship conflict and cooperation performance (effect size = –0.112, standard error (SE) = 0.061, 95% confidence interval (CI) = [–0.233, 0.009]), or the relationship between relational behavior and cooperation performance (effect size = –0.127, standard error (SE) = 0.051, 95% confidence interval (CI) = [–0.113, 0.088]). The possible explanation is that effective communication, mutual support, and collaborative engagement are essential components in establishing an environment conducive to nurturing teamwork based on current interactions rather than historical ties. The initiation and effectiveness of relational behavior in enhancing cooperation performance appear

to be independent, suggesting that once these behaviors are in motion, they have a limited reliance on prior ties to influence inter-organizational dynamics. Furthermore, the pathway from relationship conflict to cooperation performance may involve direct resource loss mechanisms, such as reduced morale and wasted time, which are less influenced by prior ties. This implies that although part negative effects of relationship conflict (on relational behavior) could be buffered by prior ties, relationship conflict could still induce instant performance deterioration that could not be mitigated by prior ties.

In light of this, prior ties play a pivotal role in the initial stages of conflict prevention through relational behavior. Contracting parties with established prior ties are more inclined to view relationship conflict as a significant threat to their valued resources, prompting them to engage in relational behaviors aimed at mitigating this threat. However, the direct impact of prior ties diminishes as the focal point shifts towards task-centered outcomes. This perspective emphasizes the importance of evaluating both the nature of resources at stake and the phase of the conflict resolution process when assessing the impact of prior ties and relational behavior on team outcomes.

6. Discussions

This study explored the effect of relationship conflict on cooperation performance and the underlying mechanism in the construction project context. Drawing upon the theoretical framework of conservation of resources theory, this study views relationship conflict as an initial loss of resources. Relational behavior embodies the initiation and accumulation of relational resources valued by participants, the decline of relational behavior represents subsequent resource losses that follow the initial loss, forming a "loss spiral". Besides, the relationship resources accumulated from prior ties are seen as a "gain spiral" and moderate the negative impact of the "loss spiral" generated by relationship conflict. In summary, this study presents a comprehensive framework, referred to as the "resource caravans and passageways framework" which aims to analyze the impact mechanisms and preventive strategies of relationship conflict. The main findings are as follows.

The study confirms the statistically significant negative effect of relationship conflict on cooperation performance in the construction project context, which is consistent with Chen et al. (2014) and Vaux and Kirk (2018). What distinguishes this study is that the authors have verified the intermediate process of relationship conflict. Compared with previous studies that only considered the direct impact of relationship conflict, the total effect of relationship conflict is much greater. This indicates relationship conflict not only affects project outcomes directly, such as delayed payments and schedule delays but also has a significant impact on resource exchange and reciprocal behaviors, thus gradually deteriorating cooperation performance between the general contractor and subcontractor.

From the conservation of resources theory perspective, relational behavior is found to partially mediate the link between relationship conflict and cooperation performance. Additionally, compared with the effect size of task conflict on relational behavior explored by Lu nad Guo (2019), this study finds the effect size of relationship conflict on cooperation performance by relational behavior is larger. One possible explanation for this is that relationship conflict not only has a detrimental effect on social relationships, which induces a resources loss spiral but also affects task elements. Extant literature viewed task conflict as a double-edged sword, although it hurts managerial behavior, it promotes resource exchange. Both parties can gain new resources from task conflict, thus offsetting the negative impact of task conflict on relational behavior to some extent.

The mitigating role of the prior ties is confirmed in our study (H3). When general contractors share prior ties with subcontractors, the negative impact of relationship conflict on relational behavior is alleviated. This finding provides empirical support for the arguments that prior ties have a positive impact on team trust development and also reinforces the findings of other studies that prior ties can inhibit the negative side of transactions (Buvik & Rolfsen, 2015; Chen et al., 2018; Lee & Chong, 2021). The establishment of a dense network through prior ties appears to facilitate trust-building, enabling teams to effectively respond to unexpected events and recover from setbacks within the resilience framework (Gilsing & Duysters, 2008; Yang et al., 2022).

7. Conclusions and implications

The authors posit that the existence of prior ties can alleviate the negative impact of relationship conflict on relational behavior by providing a certain foundation of collaboration for both parties. By exploring the mitigating effect of prior ties on the link between relationship conflict and relational behavior, it is suggested that the negative impact of relationship conflict on cooperation performance can be reduced in the construction field.

This study contributes to the literature in the following two ways. Firstly, it enhances the understanding of how relationship conflict influences cooperation performance in construction projects through the lens of the conservation of resources theory. Although previous studies have explored the negative impact of relationship conflict on project performance (Al-Sibaie et al., 2014; Vaux & Kirk, 2018; Wu et al., 2018), most of them ignored the intermediate outcome. Furthermore, it is crucial to emphasize that relationship conflict between the general contractor and subcontractor in construction projects directly influences the specific segments of their cooperation. Attempting to assess the impact of relationship conflict solely through broad measures of overall project performance may not provide nuanced insights. Therefore, this study elucidates the adverse association between relationship conflict and cooperation performance, with relational behavior as a pivotal mediator. These results emphasize the necessity

of integrating effective relational strategies into conflict management practices, thereby illuminating the significant impact of relationship conflict on the cooperation dynamics between general contractor and subcontractor.

Secondly, this study explores how prior ties can be strategically utilized as a proactive mechanism to counteract the detrimental consequences of relationship conflict. Existing literature neglected the underlying ameliorating role of prior ties on negative outcomes in inter-organizational collaboration, barely scratching the surface of their organizational significance (Chen et al., 2018). This study provides a novel perspective by employing the conservation of resources theory to explore the impact of prior ties as active moderators on reshaping the trajectory of relationship conflict. It challenges the conventional view that prior ties primarily facilitates trust and expands our understanding of its capacity to mitigate conflict (Lee & Chong, 2021; Lioukas & Reuer, 2015). Furthermore, while certain segments of the literature have posited that temporary project teams may lean towards engaging new partners to widen their resource acquisition channels (Burt, 2000; Yang et al., 2022; Lecoutre & Lièvre, 2010), this study argues that, from the standpoint of conflict prevention, selecting partners with prior ties is a more prudent choice. This nuanced exploration provides insight into the conditions under which prior ties have an impact and how specific strategies can be formulated accordingly.

This study introduces a new perspective for a deeper understanding of relationship conflict mechanisms in construction fields and enriches theories of inter-organizational relationships. Additionally, the results in this study also indicate the effectiveness of COR theory in explaining the consequences of relationship conflict in the construction field, thus extending the application context of COR theory.

The managerial implications are multifaceted and warrant careful consideration. Firstly, project managers must recognize the deleterious consequences of relationship conflict on cooperation performance. Addressing such conflicts and satisfying the diverse interests of involved parties can be arduous (De Dreu & Weingart, 2003). Project managers should prioritize fostering a collaborative atmosphere through initiatives like regular formal training, informal communication, and team-building activities. These efforts create a platform for mutual understanding and communication, thus acting as a preventive measure against relationship conflict. Secondly, from the perspective of averting relationship conflicts, those who lack prior collaborative experience tend to adopt an adversarial stance, which can significantly influence relational behavior and consequently hinder cooperation performance. This predisposition towards an adversarial stance can significantly impact relational behavior, ultimately leading to poor cooperation performance. To mitigate this challenge, it is suggested that selecting a partner with a pre-existing collaborative history creates favorable conditions for a promising start to construction projects. Furthermore, by choosing partners who share a prior connection, project stakeholders can leverage the benefits derived from established relationships. These shared ties can foster trust, enhance communication, and facilitate a smoother alignment of goals and expectations, all of which contribute to improved project outcomes. In summary, project managers should prioritize fostering a collaborative environment, acknowledge the impact of prior ties on relational behavior, and strategically leverage prior ties to establish a solid foundation for successful construction projects.

8. Limitations and future research

This study enriches conflict management literature in the construction management field by exploring the underlying mechanism by which relationship conflict influences cooperation performance through the lens of conservation of resources theory. There are also several limitations of the study. First, this study adopts questionnaires to measure each measurement. Although various data resources guarantee validity and reliability, the limitation of cross-sectional data should be acknowledged. Future studies are recommended to collect time series data to conduct further studies. Second, while the team may possess a history of cooperation with each other, it cannot be assumed that every team member has worked alongside each other. In specific, given the likelihood of turnover intention within the project team, it is plausible that certain team members may not have had the chance to directly collaborate, despite the overall existence of prior ties within the team. Therefore, future studies could explore the boundary conditions, encompassing indirect prior ties or direct prior ties. Third, it is essential to acknowledge that not all prior ties are characterized by positive associations, as negative prior ties may lack an effective mitigating function. Future research endeavors could consider this aspect to further elucidate the multifaceted nature of prior ties and their impact on relationship conflict.

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Author contributions

Jianyao JIA and Xueqing GAN conceived the study and were responsible for the design and development of the

data analysis. Xiaokun WEI, Kaiwen Jiang, and Yun LE were responsible for data collection and analysis. Tingting LIU and Xueqing GAN were responsible for data interpretation. Xueqing GAN wrote the first draft of the article.

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