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SOCIAL EXCHANGE APPROACHES TO PROMOTING INTER-ORGANIZATIONAL CITIZENSHIP COLLABORATIVE BEHAVIORS IN THE CONSTRUCTION PROJECT TEAM

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Abstract. Inter-organizational citizenship collaborative behavior (OCCB) is critical for project team members to share information and integrate resources. However, prior studies found that high OCCBs are absent in project teams. This study aims to explore social exchange approaches to promote project team members' OCCBs in the construction project team from the social exchange perspective. A questionnaire survey was undertaken online. A two-stage SEM was conducted to verify the measurement and structural models. Confirmatory factor analysis was conducted to verify the measurement model's reliability and validity, the structural model was assessed by examining the model's fitness, and path coefficients were used to test the hypotheses. The findings showed that relational social exchange is more effective than contractual social exchange for OCCBs. Meanwhile, contractual control and benevolence trust are verified as mediators between competence trust and OCCB. Three pathways are explored to enhance project team members' OCCBs: relational social exchange dominated strategy (i.e., dominant competence trust strategy and competence trust-benevolence trust strategy) and relational-contractual hybrid strategy (i.e., competence trust-contractual control strategy). This study expands the social exchange theory in the inter-organizational citizenship collaborative behavior in construction project teams and supports project management by verifying the enabling mechanisms.

Keywords: trust, contract, inter-organizational citizenship collaborative behavior, project team, mediator, social exchange.

Introduction

A project team comprises units authorized to work together on a construction project from the different departments or entities at the inter-organization level, who exchange their resources to deliver the construction projects (Pollack & Matous, 2019; Tanriverdi et al., 2021). Project team members act as the resource hub to realize the information share and scarce resource allocation through social exchange approaches (Marinho et al., 2021; Wu et al., 2017). Multiple stakeholders sometimes take initiatives that are not in the contract items, such as delivering ahead of schedule and taking extra time and energy to coordinate with others (Lim & Loosemore, 2017). These types of actions are known as inter-organizational citizenship collaborative behavior (OCCB). OCCB refers to the individual discretionary behavior, which is not directly or explicitly rewarded by the formal ways or contractual items in the project team, but this behavior improves the project performance (Yang et al., 2018). According to the social exchange theory, OCCB is a social exchange behavior because project team members exchange valuable resources when they complete construction activities (Kalkman & de Waard, 2017). Construction project team members' OCCB is also a fuzzy social exchange because of the characteristics of construction projects (i.e., temporary, disposable, regulatory constraints, negotiation, and complexity, etc.) (Braun et al., 2012). The one-off project leads project team members to adopt contractual social exchange ways at the pre-contract stage. In contrast, the relational social exchange is required when the favor society occurs in the project processing (Liu et al., 2017). For

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example, some subcontractors or material suppliers deliver a product with significantly better performance than expected because they want long-term cooperation to be the strategic partners; and general contractors provide free peer learning and exchange scenes for the developer, aiming to build a harmonious relationship. Prior studies stated that OOCB had gained much popularity in the construction project team to resolve the cost overturns, disputes and risks (Yang et al., 2020). However, OCCBs are always absent in the construction project team considering a lack of effective social exchange approaches (Braun et al., 2012). Hence, exploring the social exchange approaches is essential for promoting the project team members' OCCRs based on the social exchange theorizing.

Social exchange approaches have been explored to promote project team members' OCCBs from multiple theoretical perspectives. According to the transaction cost economic theory, a contract stipulates project team member's collaborative works or collaborative actions by the written contractual terms to formulate promises or obligations from its function perspective (Wang et al., 2019). Ning (2017) found that contract is a practical governance approach to improving inter-organizational collaboration by reducing the party's opportunistic behaviors and stipulating the allocation of risks in contractual control and contractual coordination. Due to the bounded relation and opportunism, the contract cannot fully meet the requirements for the project team members (Sabri et al., 2019). According to the social exchange theory, there are two approaches to promote project team members' OCCBs, consisting of contractual social exchange and relational social exchange. Trust is a fundamental relational social exchange approach to encourage team members' OCCBs through a psychological expectation of others' intentions. It is interesting to explore whether a contractual or relational social exchange is essential for the project team members' OCCB.

Despite implementing social exchange approaches in practice, project team member OCCRs are not always optimistic in the construction project team (Hilali et al., 2019; Newaz et al., 2020). Many studies explored the effect of contract or trust on the project team's collaborative behaviors (Engebø et al., 2020; Meng, 2015), but few studies further distinguish the detailed functions of contract (i.e., contractual control and contractual coordination) and trust (i.e., competence trust and benevolence trust) and focus on its impact on the OCCBs. This limited scope also overlooks vital combinations with straightforward strategies needed for improving OCCBs in the project team. To fill the gap, this study aims to explore the effects of social exchange approaches on the OCCBs, and then verify the enabling mechanisms underlying the approaches to reinforce OCCBs in the construction project team.

This study applies social exchange theorizing to investigate social exchange approaches for promoting the project team members' OCCBs. These two contributions are followed: (1) the complex functions of contractual and relational social exchange approaches are integrated to explore enabling mechanisms to reinforce OCCBs in the construction project team from social exchange theorizing. It provides a new perspective for the research on inter-organizational citizenship behavior. (2) the effects of social exchange on the OCCBs are investigated, which provides an essential theoretical, and practical significance for researching the pathways and governance approaches for promoting construction project teams' OCCBs.

1. Literature review and hypotheses development

1.1. Theoretical framework

According to the social exchange theory, project team members exchange their resources to achieve the desired short-term or long-term purposes based on the principle of reciprocity (Engebø et al., 2020). Trust and contract are crucial exchange approaches for attaining the OCCBs as the relational and contractual social exchange ways (Yan & Zhang, 2020). As a temporary organization, project team members prefer the contractual social exchange to achieve the explicit and short-term objectives, i.e., economic benefits through negotiations and contract items at the pre-contract stage (Ning, 2017). In the project processing, a favor society emerged. Then, project team members implement relational social exchange to pursue vague and long-term objectives, such as social relationships, trust, and altruism (Camilo et al., 2018; Lu et al., 2015). As the social exchange theory shown, the contractual social exchange provides guarantees for the OCCBs through designing the contractual items of benefits, power, and duties. In contrast, relational social exchange is used to enhance emotions through trust-based on contract. Hence, the theoretical framework is developed in Figure 1.

1.2. Trust and inter-organizational citizenship collaborative behavior

Trust is defined as the psychological expectation of other's intentions or actions (Zheng et al., 2017). As the social exchange theory showed, lack of trust undermines the basis for project team members' inter-organizational citizenship behaviors (Yan & Zhang, 2020). As a relational social exchange approach, trust is necessary for project team members to share information and resolve unforeseen ambiguities (Malhotra & Lumineau, 2011). Trust can reduce the construction project risks through frequent communication and close collaboration (Pinto et al., 2009; Sun et al., 2019). Previous studies discriminated competence trust, goodwill trust, and benevolence trust (Shi et al., 2018; Wong & Cheung, 2004). Kalkman and de Waard (2017) found that competence trust and benevolence trust

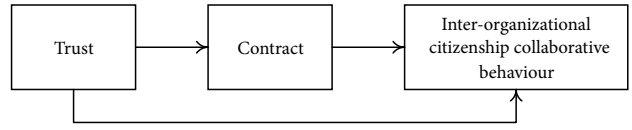

Figure 1. The theoretical framework

are selected as the criteria for choosing partners and designing contracts in the pre-contract stage. Competence trust is built mainly by evaluating project team member's capabilities to perform the construction works (e.g., technical, financial, and managerial capabilities), called primary trust (Camilo et al., 2018). When project team members do good to others in project processing, benevolence trust is built between them, called mutual trust (Hosseinian & Carmichael, 2015). Zheng et al. (2017) found competence trust is used to select a partner at the pre-contract stage, and benevolence trust is always built on the basis of reciprocity and perfect contractual performance. In practice, benevolence trust is more likely to occur when partners have high competence (Han et al., 2019). Based on previous studies, hypothesis 1 (H1) is set out as follows:

H1: Competence trust positively affects benevolence trust.

Trust enables project team members to work together effectively by fostering a collaborative atmosphere and improving emotions (Camilo et al., 2018). Participants prefer OCCBs when they trust each other (Woolthuis et al., 2016). For example, the general contractor shares the site construction information with the developer to improve the project performance through an intelligent construction platform, although it increases the inputs of the general contractor. In others, trust promotes the emotional improvement and altruistic behaviors of project team members (Han et al., 2019). For example, the developers pay the engineering funds for the general contractor in advance, considering the festival demands of migrant workers during the Spring Festival. Malhotra and Lumineau (2011) suggested that trust is a major component required to deliver the successful project team member collaborative behavior as the relational social exchange way. Nasir and Hadikusumo (2019) stated that trust affects project team collaboration, such as lack of trust between the owner and contractor leading to poor partnerships. Zhang et al. (2018) found trust benefits reduce conflicts and build close social relationships, which promotes the project team members' altruism. In project processing, parties voluntarily direct their trust toward union within an intra-organizational context through the relational social exchange (Wang et al., 2018). They believe that their partners will follow the reciprocity doctrine once an agreement has been reached and all the contracts have been signed (Woolthuis et al., 2016). Based on the previous studies, this study sets out the following hypotheses:

H2a: Competence trust positively affects inter-organizational citizenship collaborative behavior.

H2b: Benevolence trust positively affects inter-organizational citizenship collaborative behavior.

1.3. Contract and inter-organizational citizenship collaborative behavior

A contract is designed to protect participants' rights and obligations and solve the construction projects' uncertainty and complexity (Gao et al., 2018). As the contractual social exchange approach, contract focuses on the written contractual items or institutional mechanisms guiding participant's collaborative behaviors by promises or obligations (Ambrozini & Martinelli, 2017; Camilo et al., 2018; Ke et al., 2014). Prior studies focus on contractual control and contractual coordination from its function perspective (Chen et al., 2018). The details of contractual control can affect contractual coordination by dividing tasks, responsibilities, and interests (Gunduz & Elsherbeny, 2020; Newaz et al., 2020). Much contractual coordination items may be required if contractual control cannot be designed to deal with the asset specificity, measurement difficulty, and technological uncertainty in different construction projects (Yan & Zhang, 2020). This study set out hypothesis 3 (H3) as follows:

H3: Contractual control affects contractual coordination.

Contractual control focuses on clauses and legal provisions to encourage project team members to work together (Ke et al., 2016; Zhang et al., 2016a). It provides the legal guarantee for participants to resource exchange and collaborative behavior by protecting their economic interests. Unforeseen contingencies may occur in the project processing, which requires contractual coordination items to resolve the unexpected problems (Nasir & Hadikusumo, 2019). Contractual coordination items are designed to resolve these contingencies by providing a cooperative atmosphere (Gao et al., 2018). Ambrozini and Martinelli (2017) found that the contractual social exchange approach plays a fundamental role in project team members' social relationships. The contract provides cooperation opportunities for those strangers who have no partnerships experience to achieve the social exchanges of information and resources (Hilali et al., 2019; Maemura et al., 2018). Zhang et al. (2016a) stated that a contract provides a legal atmosphere for participants to collaborate and work together in construction projects formally. This study sets out the following hypotheses:

H4a: Contractual control affects inter-organizational citizenship collaborative behavior.

H4b: Contractual coordination affects inter-organizational citizenship collaborative behavior.

1.4. Meditating role of contract

According to the social exchange theory, the contract is required to ensure the legitimacy of social exchange between the project team members. Project team members are mainly selected through bids, and most of them complete the construction tasks according to the contract items. But Camilo et al. (2018) found that trust affects the design of contract items because more contractual control items need to be formulated to control participant behaviors when a lack of trust is between project team members. Meanwhile, Yan and Zhang (2020) found that project team members build trust if they deliver the construction tasks by the contract.

The contract affects the citizenship behaviors between project team members. Consummate performance behaviors strengthen the trust between partners, enhancing participants' altruistic behaviors and further achieving consummate performance subsequently (Lui & Ngo, 2016). Contract items provide the safeguards for the project team members to build trust legally and promote project team members to do collaborative citizenship behavior through the combination of the contractual and relational social exchange (Li et al., 2018). In practice, few construction projects are completed entirely through the relational social exchange without the contractual social exchange. This study hypothesized that:

H5a: Contractual control will mediate the relationships between trust and inter-organizational citizenship collaborative behavior.

H5b: Contractual coordination will mediate the relationships between trust and inter-organizational citizenship collaborative behavior.

2. Research methodology

2.1. Measurement

According to the social exchange theory, trust and contract are selected as the social exchange approaches to improve project team member OCCBs.

2.1.1. Trust

Trust is a psychological expectation of other's intentions, consisting of competence trust and benevolence trust using six measurement items (Lu et al., 2017; Mayer et al., 1995; Mcknight et al., 1998; Wong & Cheung, 2004). Competence trust refers to the belief in the other partner's abilities to perform the required works (Pinto et al., 2009). Benevolence trust refers to doing good, being loyal and receptive, and having a specific attachment to the partners (Zheng et al., 2017). Sample items are "Our partner has a good reputation in the industry" and "Our partner is honest".

2.1.2. Contract

The contract focuses on the written contractual terms by formulating promises or obligations to affect the project team member's actions, including contractual control and contractual coordination. Contractual control focuses on rules of monitoring and inspecting project team member behavior to curb opportunism and mitigate transaction risks, which forces stakeholders to accomplish collective tasks (Wang et al., 2019). Contractual coordination refers to the supplementary norms of flexibility, solidarity, and information sharing through the collaborative specification of clauses and promises, aiming to reduce contingencies and risks (Freese & Schalk, 2008; Woolthuis et al., 2016). The two latent variables for contract (i.e., contractual control and contractual coordination) were operationalized into six measurement items (Ambrozini & Martinelli, 2017; Ke et al., 2016; Lu et al., 2016; Poppo & Zenger, 2002; Ryall & Sampson, 2009; Woolthuis et al., 2016). Sample items were "The contract details the obligations and rights of every party" and "The contract allows us to respond quickly to evolving project requirements".

2.1.3. Inter-organizational citizenship collaborative behavior

OCCB refers to the individual discretionary behavior, which is not directly or explicitly rewarded by the formal ways or contractual items in the project team, but this behavior can improve the project performance. The OCCB variable is operationalized into four measurement items using interaction frequency, emotional intensity, reciprocal exchange, and familiarity (Chapman & Corso, 2005; Xue et al., 2017; Zheng et al., 2016). The sample item is "Our partners share and exchange project information". These constructs are operationalized into measurement items based on the literature review (see Table 1).

2.2. Research design and data collection method

The research design is a survey. Data are collected using a specially designed questionnaire. The questionnaire is designed according to the hypothesized model shown in Figure 1, and measurement items are identified from the literature review (see Table 1). The questionnaire comprises three parts. The first part is demographic information, including job title, years of work experience, and details of projects identified by them, such as project type, organization type, ownership of the project, and contract mode between the developer and general contractor. The second part asks respondents the extent to which they agreed that the projects identified by them have characteristics of trust and contract using a 5-point Likert scale (i.e., 1 = Strongly Disagree, 3 = Neutral, and 5 = Strongly Agree). The third part requests respondents to rate the extent to which they agree about the existence of inter-organizational citizenship collaborative behavior on the same 5-point Likert scale. Before an industry-wide survey, a pilot study is behaved to verify that the questions are unambiguous and appropriate for this study. A total of 15 experts participated in this pilot study, and minor amendments are made to strengthen the question's clarity.

The data are collected via an online survey based on convenience sampling and snowball sampling from January 12, 2020 to March 31, 2020. The snowball sampling is employed because it enables the investigators to obtain a comparatively large number of completed questionnaires more quickly and economically. The population of respondents is from the developer, consultant, designer, supervisor, general contractor, and subcontractor involved in construction projects.

2.3. Characteristics of the sample

A total of 600 survey packages are sent out. A total of 407 responses are received, of which 345 are valid responses, giving a response rate of 57.5%. Respondents come from 26 provinces/municipalities, revealing a certain generality. The profile of the respondents and their companies are

Table 1. Measurement items for trust, contract, and OCCB

Variables		Items	Source
Trust	Competence trust (T1)	Our partner has a good reputation in the industry	Kadefors (2004), Ke et al. (2015), Malhotra and Lumineau (2011), Mcknight et al. (1998), Pinto et al. (2009), Schoorman et al. (2007), Woolthuis et al. (2016)
		We feel very confident about our partner's professional skills	
		We feel very confident about the ability of our partners to perform their job	
	Benevolence trust (T2)	Our partner is honest	
		Our partner can keep its promises all the time	
		Our partner is trustworthy	
Contract	Contractual control (C1)	Our relationships are governed primarily by written contracts	Ambrozini and Martinelli (2017), Freese and Schalk (2008), Guo et al. (2013), Ling and Ma (2014), Poppo and Zenger (2002), Woolthuis et al. (2016), Yao et al. (2019), Zhang et al. (2016b)
		The contract details the obligations and rights of every party	
		The contract specifies procedures and methods for dispute resolution	
	Contractual coordination (C2)	The contract provides alternative solutions for various contingencies	
		The contract allows us to respond quickly to evolving project requirements	
		The contract has an exact specification for each construction task	
Inter-organizational citizenship collaborative behavior (OCCB)		Our partner is willing to share and exchanges project information	Chapman and Corso (2005), Chinowsky et al. (2008), Di Marco et al. (2010), Dewick and Miozzo (2004), Xue et al. (2017), Zheng et al. (2016)
		There are familiarity and mutual understanding between our partner and us	
		Our partner and we are willing to do favors for each other	
		We build friendly cooperation with our partner to promote the project success	

presented in Table 2. The results show that more than half of the respondents are at the management level (73.6%), including top managers, middle managers, general managers, project managers, project department managers, and general project managers. About one-third of them work for developers, and two-fifths work for general contractors. Most of the respondents have five or more years of experience.

2.4. Data analysis methods

After the questionnaires are received, the data are checked and entered into the SPSS21.0 and AMOS 26.0 software. SPSS21.0 is used to verify the data's reliability and validity, and AMOS26.0 is used to verify the hypothesized model using the structural equation modeling (SEM) technique. The SEM technique explores the causal relationships between factors and proves it by causal models and path analysis. Exploratory factor analysis (EFA) is conducted to analyze the measurement, and the results state that the matching of measurement items and variables is consistent with the expected. A two-stage SEM was shown to verify the measurement and structural models. Confirmatory factor analysis (CFA) was conducted to verify the measurement model's reliability and validity, which deals with the relationships between measurement items and latent constructs. The structural model was assessed by examining the model's fitness, and path coefficients were used to test the hypotheses.

Table 2. Demographic characteristics of respondents

Individual information	Frequency	Percentage
Company type		
Developer	114	33.0%
Designer	18	5.2%
Consultant	49	14.2%
General contractor	146	42.3%
Supervisor	5	1.4%
Subcontractor	13	3.8%
Position		
Top manager	8	2.3%
Middle manager	26	7.5%
General manager	66	19.1%
Project manager	19	5.5%
Project department manager	72	20.9%
Project general manager	63	18.3%
Executive and Professional staff	91	26.4%
Years of experience		
< 5	143	41.4%
5–9	156	45.2%
10–14	28	8.1%
>=15	18	5.2%

3. Results

3.1. Measurement model evaluation

The reliability and validity of all constructs are verified using confirmatory factor analysis (CFA). The reliability is measured using Cronbach's α. A Cronbach's α value of 0.70 or above means the construct's measurement items have internal consistency reliability (Tavakol & Dennick, 2011). In this study, the Cronbach's α value of each variable is more significant than 0.7 (see Table 3), indicating a high internal consistency.

The construct validity is tested using goodness-of-fit, convergent validity, and discriminant validity (Lu et al., 2015).

Table 3. Cronbach's α value of the variables

Construct	Cronbach's Alpha		
	Individual variable	Construct	Model
T1	0.889	0.917	0.907
T2	0.936		
C1	0.871	0.827	
C2	0.738		
OCCB	0.883	0.883	

The goodness-of-fit of the model is evaluated by the ratio of model chi-square to the degrees of freedom (χ^2/df), normal of fit index (NFI), relative fit index (RFI), the incremental fit index (IFI), the Tucker–Lewis index (TLI), the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). Convergent validity depicts the degree to which measurement items are correlated with their latent construct. Discriminant validity measures the extent of discrimination between the constructs. The analysis showed that the χ^2/df value is 3.0 or lower, the NFI, RFI, IFI, TLI, and CFI value are 0.9 or greater, and the RMSEA value is 0.08 or lower, revealing the fit of the model (Bagozzi & Yi, 1988). Standardized factor loading (FL), composite reliability (CR), and average variance extracted (AVE) are adopted to measure the convergent validity. The AVE should be greater than the inter-construct correlations between constructs. The results show that the standardized FL value is 0.7 or greater, CR is 0.7 or greater, and AVE is 0.5 or greater, suggesting the fitness of convergence of the model (Zhang et al., 2019). The square root of AVE value shows that there is discriminant validity.

The fit of the measurement model is shown in Table 4. The results suggest that the goodness-of-fit of the measurement model is acceptable (χ^2/df = 2.357, NFI = 0.941, RFI = 0.925, IFI = 0.965, TLI = 0.956, CFI = 0.965 and RMSEA = 0.063). Table 5 shows the descriptive statistics, construct reliability, and convergent validity of the measurement model. The means of all the variables are above 3.0, which suggests the significance of the variables. For each variable, the FL values range from 0.703 to 0.930 (except C23); CR values range from 0.747 to 0.938, and AVE values range from 0.499 to 0.835, indicating that all of them are up to the required level. The results of discriminant validity are depicted in Table 6. The square roots of AVEs of any two contracts are greater than the value of the other variables' correlative coefficients, which suggests that the discriminant validity is satisfied.

3.2. Structural model evaluation

The structural model assessment is conducted to test the hypotheses. The outcome of the structural model evaluation is shown in Figure 2. The goodness-of-fit of this model is evaluated in Table 7, and the results suggest that the hypothesized model fits the data analysis (χ^2/df = 2.334, NFI = 0.941, RFI = 0.926, IFI = 0.966, TLI = 0.956, CFI = 0.965, and RMSEA = 0.062).

Table 4. Goodness-of-fit of the measurement model

χ^2/df	RMSEA	NFI	RFI	IFI	TLI	CFI
2.357	0.063	0.941	0.925	0.965	0.956	0.965

Table 5. Descriptive statistics, construct reliability, and convergent validity

Variables		M	SD	ES	AVE	CR
T13	← T1	4.200	0.897	0.888	0.737	0.894
T12	← T1	4.287	0.919	0.902		
T11	← T1	4.238	0.917	0.781		
T23	← T2	3.728	0.972	0.911	0.835	0.938
T22	← T2	3.870	1.007	0.930		
T21	← T2	3.870	1.105	0.900		
C13	← C1	4.420	0.889	0.819	0.696	0.873
C12	← C1	4.496	0.860	0.839		
C11	← C1	4.432	0.968	0.844		
C23	← C2	4.099	1.032	0.622	0.499	0.747
C22	← C2	3.617	1.025	0.703		
C21	← C2	3.661	1.056	0.784		
OCCB14	← OCCB	4.093	0.734	0.869	0.661	0.886
OCCB13	← OCCB	3.997	0.830	0.817		
OCCB12	← OCCB	4.127	0.803	0.726		
OCCB11	← OCCB	4.218	0.708	0.833		

Table 6. Discriminant validity

Variables	OCCB	C2	C1	T2	T1	P
OCCB	0.661					
C2	0.031***	0.499				
C1	0.034***	0.041***	0.696			
T2	0.04***	0.043***	0.043***	0.835		
T1	0.037***	0.04***	0.043***	0.052***	0.737	
P	0.015***	0.013***	0.014***	0.017***	0.014***	0.514
Square root of the AVE	0.813	0.706	0.834	0.914	0.859	0.717

Table 7. Goodness-of-fit of the measurement model

χ^2/df	RMSEA	NFI	RFI	IFI	TLI	CFI
2.334	0.062	0.941	0.926	0.966	0.956	0.965

The hypotheses are acceptable if their associated path coefficients are significant at $p < 0.05$ and are consistent with the proposed directions in the structural model. Table 8 shows the results of hypotheses testing. Hypothesis H1 reveals that competence trust promotes benevolence trust (standardized path coefficient $a = 0.703$, $p < 0.001$). Trust has a significant impact on OCCB by Hypotheses H2a ($a = 0.184$, $p < 0.05$) and H2b ($a = 0.243$, $p < 0.01$) are supported. It also suggests that the effect of competence trust is greater than that of benevolence trust on OCCB. The result means OCCBs as the voluntary behaviors are still guided by rational choice instead of emotional choice.

Table 8. Results of hypotheses testing

Path	Non-standardized estimate	Standardized estimate	S.E.	C.R.	P
T1 → T2	0.783	0.703	0.057	13.689	***
T1 → C1	0.663	0.645	0.085	7.810	***
T2 → C1	–0.020	–0.022	0.070	–0.291	0.771
T2 → C2	0.164	0.227	0.046	3.544	***
T1 → C2	–0.029	–0.036	0.082	–0.351	0.725
C1 → C2	0.398	0.510	0.071	5.623	***
C2 → OCCB	–0.034	–0.037	0.075	–0.450	0.652
C1 → OCCB	0.159	0.221	0.064	2.490	0.013
T1 → OCCB	0.136	0.184	0.072	1.896	0.058
T2 → OCCB	0.162	0.243	0.054	2.975	0.003

Hypothesis H3 revealed that contractual control promotes contractual coordination (a = 0.51, p < 0.001) instead of hindering. Hypothesis H4a is supported, suggesting that contractual control contributes to OCCB (a = 0.221, p < 0.05). However, it is interesting that the contractual coordination does not affect OCCB, with H4b was not supported.

The bootstrap test is conducted to verify the mediating variables. Table 9 shows the estimation results of the test. Contractual control fully mediates the relationships between competence trust and OCCB, while benevolence trust fully mediates the relationships between competence trust and OCCB. Figure 2 is the finalized model that shows the hypotheses' estimation results with the standardized path coefficients and their significance. The results will be discussed in the next section.

4. Discussion

4.1. Trust and inter-organizational citizenship collaborative behavior

Compared to the contract, trust has a more significant effect on OCCB in this study. As the results showed, competence trust and benevolence trust positively affect OCCB with the total effects of 0.327 and 0.346, confirming hypotheses H2a and H2b. In contrast, the impact of contractual control on OCCB is 0.221. Prior studies stressed the significance of the contractual social exchange on the project team members' collaborative behavior. In contrast, this study suggested that trust as the relational social exchange can enhance the inter-organizational citizenship collaborative behaviors. It means that project team members implement inter-organizational citizenship collaborative behaviors mainly through the relational social exchange. Discussed with experts who are from the Vanke company, the results stated that most of the contract items are used to control the project team member's obligations and behaviors within the contract, while the inter-organizational citizenship collaborative behaviors mainly refer to

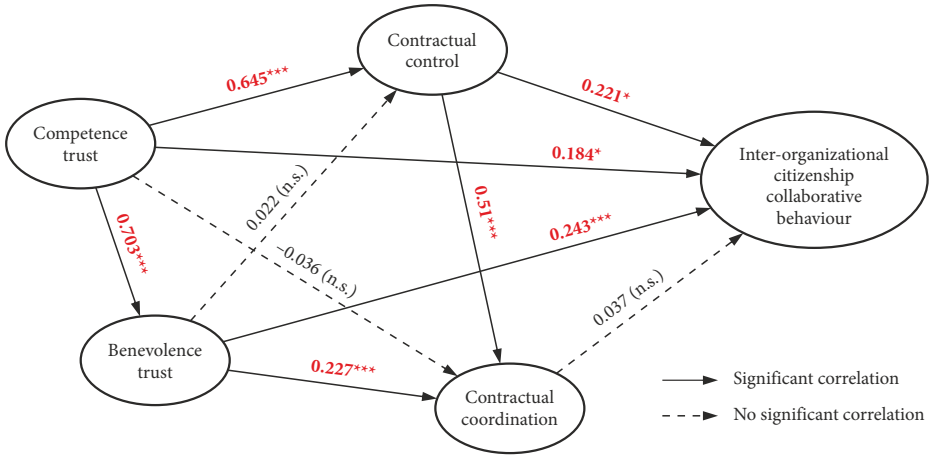

Figure 2. Results of the structural model

Table 9. Results of mediating relationships generated by bootstrap test

Path	Estimate	S.E.	Bias-corrected percentile (95%)			Percentile (95%)		
			Lower	Upper	P	Lower	Upper	P
T1-C1-OCR: stdIndT11	0.143	0.064	0.030	0.288	0.011	0.030	0.285	0.012
T1-C1-C2-OCR: stdIndT12	–0.012	0.029	–0.069	0.047	0.709	–0.074	0.045	0.627
T1-C2-OCR: stdIndT13	0.001	0.011	–0.014	0.038	0.613	–0.021	0.030	0.915
T1-T2-C1-OCR: stdIndT14	–0.003	0.014	–0.039	0.021	0.627	–0.033	0.024	0.776
T1-T2-C1-C2-OCR: stdIndT15	0.000	0.003	–0.004	0.010	0.626	–0.006	0.008	0.881
T1-T2-OCR: stdIndT16	0.171	0.063	0.056	0.306	0.004	0.057	0.307	0.004
T1-T2-C2-OCR: stdIndT17	–0.006	0.016	–0.048	0.021	0.589	–0.046	0.022	0.631

the altruistic behaviors extra the contract. Parties might do some spare time or costs to finish these collaborative works considering the relational social exchange, i.e., gaining emotion and high recognition from their partners instead of achieving the contract requirements.

Competence trust has more significance than benevolence trust for improving project team members' OCCBs with the effects of 0.355 and 0.243, respectively. This finding suggests the parties prefer to do discretionary behaviors for potential partners who have significant capacities. It means OCCB is still an economic man action, although it occurs in favor of society. Project team members' altruistic behaviors are done to gain emotional commitment from their potential partners. This finding suggests that project team members select partners s who have outstanding professional skills instead of close emotions. This study found that benevolence trust is the most critical factor for achieving the OCCB with the direct effect of 0.243 although project team members mainly rely on the contractual social exchange to realize resource sharing. The finding suggests that contractual social exchange may be a practical approach to manage the project, but it is may not be the active approach to enhance project team members' OCCBs. Project managers can strengthen team members' benevolence trust to promote their OCCB if a construction project faces many uncertainties and uncontrollable risks. Project managers can implement blockchain technology to improve the trust between the project team members by traceability and tamper-free.

4.2. Contract and inter-organizational citizenship collaborative behavior

Previous studies stated that OCCB is the individual discretionary behavior that is not directly or explicitly rewarded by the formal ways or contractual items, but this study found OCCB is also affected by the contract. Interestingly, OCCB is affected by contractual control instead of contractual coordination, although contractual coordination may improve the emotion between project team members because of much time and energy to communication and integration. Contractual control provides project team members with safeguards for information sharing, reciprocal works, communication, etc. The experts state that contractual coordination is formulated mainly to deal with the uncertainty or risks in project processing. Still, contractual coordination is always invalid because there is a lack of collaborative citizenship behaviors if disputes appear. The findings suggest that project team managers can design the details of contractual control items instead of contractual coordination to safeguard the complement of tasks and mitigate opportunistic risks. Meanwhile, this finding suggests participants should complete the construction tasks in accordance with the contractual control items to enhance the OCCBs.

4.3. Mediating roles of contractual control and benevolence trust

Prior studies identified the effects of contract and trust on the in-role contractual collaborative behaviors, but few studies verified their specific effects on extra-role OCCBs. This study proved the mediating role of contractual control between competence trust and OCCB (H4a). The finding suggests that competence trust and contractual control are complementary to promote project team members' OCCBs. It states the significance of contractual control between the competence trust and OCCB as the mediator. The result suggests that contractual control enhances competence trust's effect on the project team members' OCCBs by providing the legal guarantee. Project managers can select the competence-based trusted partners and designing a well-crafted contractual control document at the pre-contract stage to promote OCCBs. Further, the result also suggests that the project manager can improve project team members' OCCBs by controlling their contract performance behavior through IT techniques (i.e., blockchain technology) in a traceable and irreversible way.

Benevolence trust is a vital social exchange approach as the mediator between competence trust and OCCB. In practice, project team members engender benevolence trust when competence-trusted partners perform competently (H1). These project team members implement OCCB after benevolence trust being formulated. Many companies develop an enterprise resource planning system to enhance benevolence trust between potential partners. For example, general contractors established an enterprise resource planning system of many material suppliers and product suppliers. This system stores information of the subcontractors, such as basic information (i.e., product information, professional or technical capabilities, industry reputation, etc.) and records the contract performance (i.e., on-time delivery, optimal cost, and quality improvement). Participants selected from the system are easier to build benevolence trust compared with the first-time partners. The result suggests managers establish an enterprise reputation evaluation system, and the government set a big data platform to benefit partner selection and save the transaction cost.

Conclusions

This study explored the social exchange approaches to promoting inter-organizational citizenship collaborative behaviors in the construction project team. The proposed model was tested using data collected from a questionnaire survey and analyzed using SPSS and AMOS software.

First, this study verified the effects of competence trust, benevolence trust, and contractual control on the construction project team members' OCCB from the per-

spective of social exchange theorizing. This study found that the relational social exchange approach is more important than the contractual exchange approach for improving the OCCB. Competence trust is verified as the most extraordinary practical approach for enhancing project team members' OCCBs with the total effect of 0.498, which reveals OCCB is the rational social exchange behavior instead of the Culture of Drinking in the construction project team.

Second, the mediating roles of contractual control and benevolence trust are verified between competence trust and OCCB. Three pathways are investigated for enhancing project team members' OCCBs: relational social exchange dominated strategy (i.e., dominant competence trust strategy, competence trust-benevolence trust strategy) and relational-contractual hybrid strategy (i.e., competence trust-contractual control strategy). Project managers can stress the contractual control and benevolence trust to improve the project team members' OCCBs.

Theoretical contributions

Our study has three theoretical contributions. First, this study explores the social exchange approaches for the inter-organizational citizenship collaborative behaviors in the construction project team. It provides information to support decision-making by project team members to conduct altruistic behaviors by relational social exchange and contractual social exchange. Second, the enabling mechanisms underlying the social exchange approaches are discussed to enhance project team members' OCCBs. Project managers can mainly design governance mechanisms as a leverage point to reinforce project team members' OCCBs. Finally, the mediating role of contractual control are verified between competence trust and OCCB, which suggests that contractual control is crucial for OCCB, although the formal ways or contractual items do not directly or explicitly reward it.

Practical contributions

Our study also has three practical applications and implications for implementing effective governance approaches for improving project team OCCBs. First, this study explores the significant factors affecting project team members' OCCBs, including competence trust, benevolence trust, and contractual control. It implies project managers can enhance the project team members' OCCBs through selecting the competence-based trusted partners, designing the detailed contractual control items at the pre-contract stage, and fostering benevolence trust in the postcontrast setting. Second, contractual control and benevolence trust are identified as mediators between the competence trust and OCCB. It suggests that the project manager can improve project team members' competence trust to improve their OCCBs by controlling the contract performance behavior. Further, companies can develop an enterprise resource planning system to record the information and to provide the basis for benevolence trust. Finally, this study verifies three pathways to promote project team members' OCCBs: relational social exchange dominated strategy (i.e., dominant competence trust strategy, competence trust-benevolence trust strategy) and relational-contractual hybrid strategy (i.e., competence trust-contractual control strategy).

Limitations and future direction

The results and contributions of our study should be considered considering some limitations. A limitation is data were collected from the construction company in China. In future research, data will be collected from different countries for comparative analysis and verifying the implementation of research results. Some factors affecting project team members' OCCBs may be ignored due to research scope, such as contract mode, company type, organizational structure, enterprise characteristics, etc. Future studies will consider such factors to analyze the effects on the OCCBs. Finally, new technologies such as blockchain technology, smart contracts, and building information models can also improve project team members' OCCBs and be considered to improve the project team members' OCCBs. Although this was somewhat overcome by anchoring the numerical values, these factors will be considered in future studies.

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Author contributions

Hong Xue and Florence Yean Yng Ling conceived the study and were responsible for the design, questionnaire, draft preparation and development of the data analysis. Tao Sun was responsible for data collection and analysis. Yirou Song and Junwei Zheng prepared the original draft.

Disclosure statement

The authors would like to declare that they no competing financial, professional, or personal interests from other-parties.

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