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Effect of Perceived Justice on Subcontractor Willingness to Cooperate: The Mediating Role of Relationship Value

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Abstract: Cooperation between subcontractor and general contractor provides the foundation for the successful delivery of every construction project. As one of the most important factors influencing subcontractor behavioral intentions, the perceived justice from previous collaborative experience affects the willingness of a subcontractor to cooperate with a general contractor in the future. In this paper, a model is built based on social exchange theory to examine the relationship between justice perception, relationship value and subcontractor willingness to cooperate (WTC). Analysis of data from 122 subcontractors demonstrates that distributive justice and interactional justice positively affect WTC, and relationship value from the general contractor partially mediates such effects. However, procedural justice does not significantly affect WTC. The study provides a new perspective for examining the internal mechanisms between subcontractor justice perception and WTC. The findings will also help general contractors understand how their

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behaviors affect subcontractor WTC, thus providing practical implications for subcontracting management.

Key Words: Social Exchange Theory; subcontractor; perceived justice; relationship value; willingness to cooperate;

Introduction

In many construction projects, the general contractor plays the role of project coordinator, while 80-90% of the actual work is performed by subcontractors (Hinze and Tracey, 1994; Polat, 2015). Cooperation between the subcontractor and general contractor is essential for the smooth completion of a construction project and therefore the selection of an appropriate subcontractor with which to cooperate is of great importance as it influences both project delivery and the general contractor's reputation and survival (Hartmann et al., 2009). In particular, due to the intense level of competition in the construction market, general contractors prefer to choose the subcontractors with whom they have previously worked to form a long cooperative relationship (Tserng and Lin, 2002). Previous studies illustrate that cumulative values in relational cooperation (a long-term relationship over a series of projects or transactions) are much higher than those in transactional cooperation (a short-term relationship for a specific project or transaction) (Eriksson, 2007). Therefore, it is necessary and beneficial to change a transactional cooperative relationship to a relational one and maintain long-term cooperation.

Normally considered a traditional sector, the construction industry has attracted much

criticism for its adversarial relationships between general contractors and subcontractors (Cheng and Li, 2002, Eriksson et al., 2008). Many subcontractors believe that general contractors treat them as subordinates and do not understand the principles of cooperation or a partnering relationship. Even those who have experienced successful cooperative relationships with general contractors still believe there are problems in their relationships with general contractors (Dainty et al., 2001). As a result, subcontractors with little intention to re-cooperate not only charge high prices but also are more likely to create managerial problems, especially as most subcontractors are selected by the general contractor only at the last minute (Tserng and Lin, 2002). Consequently, the research question merits attention: What are the factors most likely to affect subcontractors' willingness to cooperate with the general contractor again in the future?

Of the various factors affecting subcontractors' willingness to cooperate, the justice perceived from their previous collaboration experience is of primary importance. Previous studies have found justice perception have a positive effect on cooperative behavior (Griffith et al., 2006) and behavioral intention (Namkung and Jang, 2009). Other studies have also been performed to explore the underlying mechanisms between justice perception and behavioral intention. For example, Kim et al. (2009) have verified that trust and satisfaction play mediating roles between justice perception and revisit intention; and Söderlund and Colliander (2015) found that justice perception positively affects the customer's repurchase through satisfaction.

When exploring the underlying mechanisms between justice perception and behavioral intention, many studies focus more on relationship quality (satisfaction, commitment and trust)

than relationship value as the mediating variable. As the most important requirement for marketing activities (Walter et al., 2001), value is closely related to both justice perception (Luo, 2007) and cooperative intention (Hogan, 2001). Customers are more likely to buy products when their relationship with the suppliers can create value for them. Similarly, a company executes a project only if it can increase the relationship value for the company itself. Therefore, there is an urgent need to use relationship value as a mediating variable to understand the underlying mechanisms involved. In doing this, this study builds a theoretical framework based on social exchange theory to investigate the relationship between justice perception and willingness to cooperate.

Theoretical Framework

Social Exchange Theory

The basic motivation for individuals and companies to interact with others is the expectation of rewards or avoidance of punishment (Griffith et al., 2006), and social exchange theory (SET) argues that an individual's attitudes and behaviors are determined by the tradeoff between these two outcomes (Masterson et al., 2000). SET contends that people tend to repeat actions that were rewarded in the past (Chernyakhai and Tziner, 2014). As for companies, the more favorable are the outcomes received through the exchange relationship, the more likely companies will tend to maintain cooperative relations in the future. SET, as one of the most influential paradigms in justice perception (Masterson et al., 2000), is often used to explain the effects of justice perception on attitudes and behaviors. In applying SET, the current study argues

that willingness to cooperate is stimulated by justice perception and that the more justice subcontractors receive from the general contractor, the more likely they will respond with more inputs and other forms of cooperative behaviors.

Relationship Value

Relationship value (RV) is a subjective concept in relationship marketing that focuses primarily on the value obtained from the exchange relationship, especially a long term relationship (Ye and Zhang, 2013). It is concerned with both benefits and costs and their tradeoff in a business relationship (Ravald and Grönroos, 1996). RV is therefore defined as a binary concept comprising relationship benefits and relationship sacrifices (Ulaga and Eggert, 2005). Furthermore, all the parties involved gain value from the transaction relationship. Accordingly, Ulaga and Eggert (2003), for example, divide RV into value-*to*-customer and value-*of*-customer RV, while Voss and Kock (2013) discern the two RV elements of relationship value *for* customer and relationship value *from* customer. Similarly, RV in this study is composed of relationship value *from* the general contractor (VFROM) and relationship value *for* the general contractor (VFOR). VFROM means the value that the subcontractor gains from the general contractor in terms of both money or profits (direct value) and additional benefits such as competitiveness and brand awareness (indirect value). VFOR, on the other hand, is defined as the benefits that the subcontractor provides to the general contractor in terms of both project-related benefits (project cost, time, quality) and joint working between parties in a relationship engaged in a combination of decision making and problem solving (Ulaga and Eggert, 2005).

Willingness to Cooperate

In this study, willingness to cooperate is defined as the intention of subcontractors to re-cooperate with a general contractor in the future. Unlike some studies that use cooperative intention as the desire to behave cooperatively to improve performance during a project, this study mainly focuses on maintaining a long and stable business cooperative relationship. Inter-firm long-term cooperation is recognized as an important factor in obtaining a competitive advantage (Ryu et al., 2007). For a general contractor, having a long-term cooperative relationship, such as a partnership or strategic alliance with a subcontractor, means it can have a deeper knowledge of the subcontractor through prior experience (Tserng and Lin, 2002). Working with such subcontractors can effectively reduce uncertainty and management costs (Dainty et al., 2001; Hartmann et al., 2009). It is therefore important for general contractors to cultivate their subcontractors' willingness to cooperate with them.

Hypotheses and Theoretical Model

Distributive justice and Relationship Value

Distributive justice (DJ) refers to the fairness of a transaction through comparison between outcomes and inputs (Adams, 1965). In this study, DJ is defined as the fairness of the subcontractors' rewards with respect to their inputs (time, manpower, etc.). Fair systems can guarantee employees value economic gains, and distributive justice can help them obtain satisfactory outcomes. DJ positively affects employees' benefits so they are very sensitive to distributive justice (Colquitt, 2001). Luo (2009) claims it also has a positive effect on

cooperation outcomes in international joint ventures and that heightened DJ improves the balance between responsibilities/rights and contribution/returns. According to the SET, the more DJ received by a company, the more value it will provide by putting effort into the cooperative relationship. Moreover, studies show that gain-sharing fairness (allocation of benefits between cooperating parties) affects a new gain-generation (Luo, 2009). Distributive injustice will make one party adopt uncooperative behaviors that are harmful to both parties (Kerwin et al., 2015). In the construction industry, DJ can increase a subcontractor's satisfaction with the outcome and put more resources (manpower, time, money, etc.) into a project, which is beneficial to both parties. Based on these arguments, therefore, it is hypothesized that:

H1a: Distributive justice has a positive effect on relationship value *for* general contractors.

H1b: Distributive justice has a positive effect on relationship value *from* general contractors.

Procedural Justice and Relationship Value

Procedural justice (PJ) emphasizes not only the fairness of policies and processes but also whether the decision-making processes are fair (Lind et al., 1993). PJ is used here to describe the degree to which policies and procedures are equitable and impartial. Scholars argue that PJ not only positively affects value creation (Liu et al., 2012), but also has a direct effect on operational outcomes and an indirect influence on economic benefits (Luo, 2008). As for the “value from”, PJ can mitigate the disappointment incurred by unfair distribution (Lind et al., 1993) and engender the perception of greater value (Kim and Mauborgne, 1998). Thibaut and Walker (1975) also found that PJ has a positive effect on protecting individuals' interests and profits. As for the

“value for”, due to its function of removing the fears of exploitation and showing respect, PJ, which can decrease conflicts and have a significant influence on relational behaviors, has been considered as a driver of favorable outcomes (Griffith et al., 2006). Luo (2008) found that PJ can add more relationship value to both parties by increasing trust and commitment. Furthermore, unfair processes or procedures, which may decrease work efficiency and cooperative behaviors between project participants, can damage the perceived material benefits or psychological outcomes of both parties (Aibinu et al., 2008). For the construction industry, characterized by adversarial relationships between parties, procedural justice can reduce opportunism and conflicts and create more value for both general contractors and subcontractors. Based on these arguments, it is hypothesized that:

H2a: Procedural justice has a positive effect on relationship value *for* general contractors.

H2b: Procedural justice has a positive effect relationship value *from* general contractors.

Interactional Justice and Relationship Value

Interactional justice (IJ), which consists of informational and interpersonal justice, emphasizes the fairness of informational communication between people and interpersonal treatment in the cooperative relationship (Colquitt, 2001, Luo, 2007). This study defines IJ as subcontractors’ justice perception through interaction with the general contractor and is concerned with the socialization behavior that occurs during the process of interaction. As Ellis et al. (2009) demonstrate, informational justice has a significant effect on value creation. On one hand, IJ implies the degree to which two parties communicate candidly and timely as well as

providing a reasonable explanation of the procedures involved (Liu et al., 2012). High informational justice means the information can be conveyed more timely and thoroughly (Kumar et al., 1995). Therefore, IJ can have a positive effect on performance and on producing value for themselves (VFROM) through improved performance efficiency. On the other hand, IJ is concerned with whether people are treated respectfully and politely, and is positively related to trust and commitment. High IJ can ensure they receive more social benefits (courtesy and esteem) in the process of interaction. Researchers have also found that IJ has a positive influence on relational behaviors (Liu et al., 2012). According to SET, the higher interpersonal justice they perceive, the higher is their intention to behave cooperatively and maintain the relationship (Namkung and Jang, 2009), which can produce more value for both parties. In the construction industry, IJ can help subcontractors gain more social benefits and act as a motivation to increase the amount of effort in conducting their work, which generates more value to both general contractors and subcontractors. Thus, it is hypothesized that:

H3a: Interactional Justice has a positive effect on relationship value *for* general contractors.

H3b: Interactional Justice has a positive effect on relationship value *from* general contractors.

Relationship Value and Willingness to Cooperate

Relationship value, used to describe value from the viewpoint of relationship marketing (Ulaga and Eggert, 2005), is obtained by all participants in a business relationship (Ulaga and Eggert, 2003). On one hand, according to SET, the more value subcontractors receive, the more

value they will reciprocate. After gaining relationship value, transacting parties not only perform their transaction functions but also exceed expectations and assume more responsibilities to provide extra value to their partners (Biggemann and Buttle, 2012). On the other hand, researchers have also demonstrated that the relationship value from the customer has a positive effect on project success, which is of value for both company and customer (Voss and Kock, 2013). Hence, a party gaining benefits from a business transaction is more likely to create increased value for both parties to maintain a long-term cooperative relationship. Thus, it is also hypothesized that:

H4: VFROM has a positive effect on relationship value for general contractors.

Researchers have found that companies maintain a cooperative relationship either because “they want to”, due to its high relationship value, or because “they have to”, because of the high cost of switching (Geiger et al., 2012). Relationship value is an important driver of the transaction (Hogan, 2001). Lewin et al. (2008) found a positive relationship between relationship value and future intention. The relationships between relationship value, relationship quality and behavioral outcomes have been examined by Ulaga and Eggert (2006) with results suggesting that RV not only has a direct positive effect on a manager’s intention to expand business with suppliers but also has an indirect effect through trust and satisfaction. Geiger et al. (2012) found that RV has a positive effect on intention for relationship enhancement. VFOR refers to the value that subcontractors offer to general contractors. The more value they offer, the more likely they are to form a valuable relationship. With a satisfactory relationship, the parties are more inclined

to resolve any conflicts peacefully and reconcile with their partners (Ohtsubo and Yagi, 2015). Parties more concerned with their long-term relationships are more willing to maintain them. As for the VFROM, people will not cooperate any more if they cannot gain any value for themselves from the relationship (Voss and Kock, 2013). SET argues that the more the parties favor the outcomes, the more likely they will respond in the form of cooperation (Luo, 2008). Furthermore, the literature also suggests that the value people receive has a positive effect on their motivation to sustain the exchange relationship (Ulaga and Eggert, 2003). Based on these arguments, two final hypotheses are proposed:

H5a: VFOR has a positive effect on subcontractors' willingness to cooperate.

H5b: VFROM also has a positive effect on subcontractors' willingness to cooperate.

The conceptual framework based on the proposed hypotheses is presented in Fig.1.

Research Methodology

Measurement of Constructs

Due to the tremendous amount of interest in cooperation and partnerships in recent decades, many measurements have been developed for perceived justice, relationship value and willingness to cooperate. However, most of these are for the service and supply chain industry rather than in the construction industry. As a result, the study began with a review of the measurement scales of previous studies. Based on this, a questionnaire was developed with items modified to suit the special characteristics of the construction industry. The items measuring three different dimensions of justice perception were adapted from Colquitt (2001) and Grégoire

and Fisher (2008); those assessing the two dimensions of relationship value were developed from Cheung et al. (2010) and Voss and Kock (2013); and those measuring WTC were adapted from Kim et al. (2009) and Maxham and Netemeyer (2002). Separate in-depth interviews were then conducted with 12 construction industry professionals and revisions were made to improve the accuracy and readability of each item according to their feedback. Finally, a full-scale questionnaire was developed to evaluate their agreement with the measurement items on a scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Data Collection

The finalized questionnaire was distributed to potential subcontractor respondents in two ways: on site and through the Internet. Due to the difficulty in constructing a sampling frame, a non-probability sampling (snowball sampling) was adopted to select respondents, which was considered appropriate to obtain a representative sample (Patton 2001). Initially, 68 paper-based questionnaires were distributed to subcontractors attending a project-training course held in Tianjin University by the China Construction Industry Association mainly to provide training to the managerial staff of some state-owned construction companies. Then, 382 questionnaires were distributed (156 by email and 226 through hyperlink) to their colleagues with their help. The survey lasted for nearly 5 months and 143 responses were obtained. After discarding problematical returns from the data set, 122 useable responses were retained for analysis. The final response rate of 27.11% is acceptable compared with the 20%–30% recovery rate for most construction industry questionnaire surveys of this kind (Akintoye, 2000, Liu et al., 2016).

Descriptive statistics of the demographic characteristics of the respondents are provided in Table 1.

Analysis and Results

Structural equation modeling (SEM) is regarded as an appropriate technique for analyzing relationships involving more than one dependent variable (Chen et al., 2011, Xiong et al., 2014). There are two types of SEM: covariance-based (CB-SEM) and partial least squares (PLS-SEM). Compared with CB-SEM, the advantages of PLS-SEM include not being limited by restrictions on data sample size and the normal distribution assumption (Chin et al., 2003). And it has been used in many construction management studies (Doloi, 2014, Ning and Ling, 2013, Zhao et al., 2014). SmartPLS 2.0 is therefore chosen to examine the significance of the hypotheses.

Measurement Model

As Cronbach's alpha is easily affected by the number of items and generally leads to underestimated results, *composite reliability* is used to assess internal consistency reliability (Hair et al., 2013), with a suggested threshold value of 0.7. As Table 2 indicates, the values of each multi-item variable are all higher than the critical value and therefore the internal consistency is high (Fornell and Larcker, 1981). For convergent validity, all factor loadings should be larger than 0.7 and the average variance extracted (AVE) should exceed the recommend 0.5 threshold (Fornell and Larcker, 1981). As shown in Table 2, both criteria are satisfied so that the convergent validity is confirmed. Indicator reliability, measured by the outer loadings of variables, is used to assess the degree the associated indicators have in common. As

these are all above 0.70, indicator reliability is also satisfied (Hair et al., 2013).

For discriminant validity, an indicator's items loading should exceed the cross loadings, and the square root of the AVE of each construct should exceed the inter-construct correlations (D'Arcy and Galletta, 2009, Hair et al., 2013). As shown in Table 3 and Table 4, both criteria are met so the discriminant validity is also confirmed.

Structural Model and Hypotheses Testing

Since the reliability and validity of the structural model are confirmed, a bootstrapping process (5000 subsamples, 122 cases) is conducted to test the significance of the structural model at the 95% confidence interval. A hypothesis will be accepted only if the T-statistics is larger than the critical value of 1.96. A summary of the hypotheses tests is provided in Table 5.

Regarding H1a, the relationship between DJ and VFOR is positive but not statistically significant ($\beta=0.017$, $p>0.05$). As for H1b, DJ has a significance positive effect on VFROM ($\beta=0.266$, $p<0.05$). H2a and H2b predict that there is a positive relationship between PJ and the different dimensions of relationship value. However, PJ does not have a significant positive effect on VFOR ($\beta=0.201$, $p>0.05$) or VFROM ($\beta=-0.074$, $p>0.05$). Hence, H2a and H2b are not supported. As for H3a and H3b, both VFOR ($\beta=0.542$, $p<0.05$) and VFROM ($\beta=0.640$, $p<0.05$) are positively influenced by IJ. Table 5 shows that VROM has a significant positive effect on VFOR ($\beta=0.314$, $p<0.05$). Thus, H4 is supported, which implies that the increase in VROM will significantly improve VFOR. As for H5a, the finding shows that VFOR has a positive effect on WTC but not significant ($\beta=0.169$, $p>0.05$). Hence, H5a is rejected. Regarding the hypothesis

H5b, the result shows that VFROM has a significant positive influence on WTC ($\beta=0.653$, $p<0.05$), which suggests that H5b is supported.

As an additional step, the mediation effects of relationship value are tested in the theoretical model. First, a model with VFOR and VFROM removed is run to examine if the data support the direct effects of justice perception on WTC. The results show that DJ and IJ both have a significant direct effect on WTC ($p<0.05$), while PJ does not. Combining the path hypotheses, this indicates that VFROM plays a partial mediation role not only in the relationship between DJ and WTC, but also in the relationship between IJ and WTC. Examining the intervening effects of VFROM on the relationship between different dimensions of perceived justice on VFOR in the same way, indicates that VFROM fully mediates the relationship between DJ and VFOR and partially mediates the relationship between IJ and VFOR.

Discussion

The significantly direct and indirect effects of distributive justice on WTC suggest that, when subcontractors perceive higher justice, they are more willing to maintain a long-term cooperative relationship with their main contractors. This is consistent with prior research findings that DJ is positively associated with cooperative behavior and behavioral intention (Maxham and Netemeyer, 2002). Fair distribution indicates that subcontractors can receive equivalent payments relative to their inputs. With these favorable outcomes, subcontractors prefer to cooperate with this general contractor in the future.

It is interesting to find that the results related procedural justice are contrary to expectations.

Process is an essential part of service offering or business exchange (Maxham and Netemeyer, 2002) and Aibinu et al. (2008) argued that PJ has a significant effect on people's attitudinal and behavioral reactions. However, none of the hypotheses related to this are supported here. A possible explanation is that the study was conducted in the Chinese context, which is characterized by weak legal enforcement because of government intervention (Zhang et al., 2016; Zhou and Poppo, 2010). When conflicts arise, especially conflicts between state-owned enterprises, the government often dismisses contract law in favor of accommodating companies with strong political connections. Therefore, managers cannot perceive the legal system as being credible enough to protect their interests, so they are more likely to rely on relational reliability (close connections with government and business partners) rather than contracts to safeguard their transactions. There are many cases of Chinese companies suffering heavy losses for downplaying the importance of procedures, local laws and contractual obligations. For example, one Chinese company was penalized hundreds of millions of dollars in the Poland Highway Project for these reasons.

As for interactional justice, the analysis confirms its effective impact on VFOR, VFROM and WTC. Researchers and professionals have long claimed the benefits of maintaining a good relationship with collaborators (del Río-Lanza et al., 2009; Luo, 2007). This result suggests that subcontractors will reciprocate by adopting positive attitudes to maintain long-term cooperation if general contractors treat them fairly. Therefore, it is not surprising that interactional justice plays the most fundamental role in affecting subcontractors' willingness to cooperate. This

phenomenon also can be perfectly explained by the influence of Chinese culture, which is already known to significantly influence justice perception and partnering relationships (Chen and Partington, 2004). In China, people value personal relationships and interpersonal relations highly. The traditional term, *guanxi*, in Chinese has a significant influence on all forms of cooperative relationships.

As for the relationship value, the results show that VFROM rather than VFOR plays a mediating role between justice perception and WTC. This indicates that, when making a decision about whether to cooperate with general contractors, the value subcontractors have obtained from a general contractor plays a more important role than the value subcontractors have provided to the general contractor. In addition, VFROM has a strong positive effect on VFOR, which suggests that general contractors can benefit from providing more value in the business relationship with their subcontractors because this, in turn, prompts the subcontractors to create more value for their general contractors.

Theoretical and Managerial Implications

Based on these results, this study provides a number of theoretical and managerial insights for general contractors to improve their management of subcontractors in practice. Theoretically, the primary contribution of this study has been to reveal the relationship between subcontractors' perceived justice and their willingness to cooperate. Previous studies have verified the linkage between justice perception and cooperative behavior or cooperative intention. This study extends current research and makes three contributions to the existing literature. First, in contrast with

studies that focus on the mediating role of “trust”, “commitment” and “satisfaction” in exploring the relationship between justice and intention, this study provides a new perspective by introducing an important variable, relationship value, to examine the internal mechanism between subcontractors’ justice perceptions and cooperative willingness. Second, previous studies of cooperative intention or cooperative behavior in the construction management area mainly focus on the desire to behave cooperatively during project execution, while this study pays more attention to maintaining long-term cooperation, which enriches the literature relating to partnerships or strategic alliances between construction companies. Third, most studies in the construction industry regard justice perception as a single dimension construct, while this study explores the different effects of three dimensions of justice perception on WTC.

In terms of management, this study provides significant practical implications for general contractors in subcontractor management. A long-term cooperative relationship based on justice perception and relationship value can enhance the stability and flexibility of subcontractor cooperation in future. Through the improvement of distributive and interactional justice perception, general contractors can stimulate the subcontractors’ relationship value and willingness to cooperate. Therefore, in order to improve subcontractors’ willingness to cooperate in future, general contractors need to take measures to enhance distributive justice and interactional justice. In particular, general contractors need to be aware of the importance of interactional justice and pay close attention to maintaining good interfirm interactions with their subcontractors.

Conclusion and Further Research

This study investigated the relationships between perceived justice, relationship value and willingness to cooperate. Consistent with SET, the findings demonstrate that DJ, IJ and VFROM have a direct positive effect on WTC, while the effects of PJ and VFOR on WTC are not significant. It is found that VFROM, rather than VFOR, plays a mediation role between distributive justice, interactional justice and WTC. The findings confirm that subcontractors gaining more value from a general contractor reciprocate in providing more value to the general contractor. Therefore, enhancing a subcontractor's justice perceptions will be beneficial to general contractors in maintaining a long cooperative relationship.

While these results help in understanding the intrinsic mechanism between the dimensions of justice perception and willingness to cooperate, certain limitations and future research directions are noted. First, this study adopted non-probability sampling to select respondents. Despite the intrinsic limitations, it is appropriate to select respondents when they participated in the questionnaire based on their willingness (Wilkins 2011; Zhao 2014). Second, considering the feasibility and convenience of data collection, the relationship value for general contractor is measured using data from subcontractors, so can only be seen as a proxy (Voss and Kock, 2013). Third, all the research data were collected from Chinese subcontractors, while researchers have found that different cultures may have different influences on perceived justice and inter-organizational relationships (Lund et al., 2013) and therefore the generalizability of the findings may be limited. With globalization and integration, therefore, it might be useful and

interesting to test and compare the models in other cultural contexts. Four, the relationships among justice perception, relationship value and willingness to cooperate may be affected by factors such as procurement context, project type, subcontractor type and asymmetrical dependence. Construction projects are often carried out in a complex environment. Thus, the moderating effects of these factors need to be tested in future research. Studies of the antecedent factors of justice perception and relationship value would also provide a major contribution to such research topics as strategic alliances and partnerships.

Supplemental Data

The measurement of constructs involved in the model are available online in the ASCE Library (www.ascelibrary.org).

Data Availability

The data generated or analyzed during the study are available from the corresponding author on request. Information about the Journal's data sharing policy can be found here: <http://ascelibrary.org/doi/10.1061/%28ASCE%29CO.1943-7862.0001263>.

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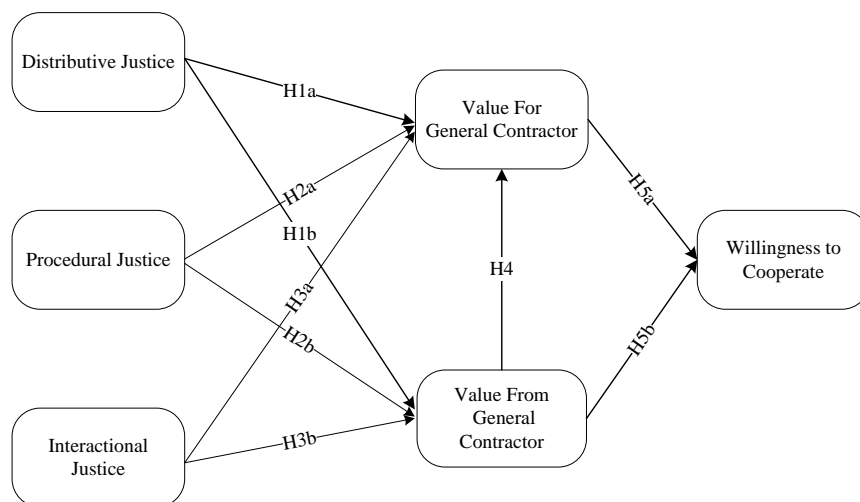


Fig.1. Theoretical Framework and Hypotheses

Table 1. Profile of Respondents

Characteristics	Categorization	Number	Percent
Work experience	1-5 years	41	33.61%
	6-10 years	38	31.15%
	11-15 years	32	26.23%
	Above 16 years	11	9.02%
Position	Senior management	12	9.84%
	Project manager	36	29.51%
	Project management staff	47	38.52%
	Technical staff	27	22.13%
Total Number of projects completed as a subcontractor	1	6	4.92%
	2-4	55	45.08%
	5-7	18	14.75%
	More than 8	43	34.25%
Work Scope*	Labor Subcontractor	31	25.41%
	Specialty Subcontractor	65	53.28%
	Supplier	24	19.67%
	Other	18	14.75%

Note: *Some respondents do more than one job in the project. For example, one may be a labor subcontractor and supplier at the same time. Therefore, the total number of work scope is 138 rather than 122.

Table 2. Measurement Model Evaluation

Construct	Construct Indicators	Factor Loading	Indicator Reliability	CR	AVE
DJ	DJ1	0.864	0.746	0.896	0.682
	DJ2	0.838	0.702		
	DJ3	0.799	0.638		
	DJ4	0.802	0.643		
IJ	IJ1	0.847	0.717	0.923	0.749
	IJ2	0.868	0.753		
	IJ3	0.914	0.835		
	IJ4	0.832	0.692		
PJ	PJ1	0.856	0.733	0.907	0.765
	PJ2	0.871	0.759		
	PJ3	0.897	0.805		
VFOR	VFOR1	0.822	0.676	0.896	0.684
	VFOR2	0.853	0.728		
	VFOR3	0.824	0.679		
	VFOR4	0.809	0.654		
VFROM	VFROM1	0.901	0.812	0.926	0.758
	VFROM2	0.903	0.815		
	VFROM3	0.872	0.760		
	VFROM4	0.802	0.643		
WTC	WTC1	0.879	0.773	0.917	0.733
	WTC2	0.901	0.812		
	WTC3	0.787	0.619		
	WTC4	0.855	0.731		

Note: Distributive Justice=DJ; Interactional Justice=IJ; Procedural Justice=PJ; Relationship value for general contractor=VFOR; Relationship value from general contractor=VFROM; Willingness to Cooperate= WTC.

Table 3. Correlations of Latent Variables and the Values of Discriminant Validity

Construct	AVE	DJ	IJ	PJ	VFOR	VFROM	WTC
DJ	0.682	0.826					
IJ	0.749	0.753	0.865				
PJ	0.765	0.748	0.765	0.875			
VFOR	0.684	0.574	0.708	0.627	0.825		
VFROM	0.758	0.692	0.784	0.615	0.672	0.871	
WTC	0.733	0.662	0.681	0.540	0.608	0.767	0.856

Note: Figures in bold represent the square root of each construct's AVE value.

Table 4. Cross Loadings of Each Indicator

Construct	Item Code	DJ	IJ	PJ	VFOR	VFROM	WTC
DJ	DJ1	0.864	0.664	0.581	0.538	0.682	0.658
	DJ2	0.838	0.655	0.663	0.471	0.540	0.590
	DJ3	0.799	0.570	0.666	0.438	0.518	0.436
	DJ4	0.802	0.592	0.575	0.438	0.525	0.477
IJ	IJ1	0.661	0.847	0.655	0.611	0.694	0.635
	IJ2	0.629	0.868	0.628	0.547	0.652	0.534
	IJ3	0.678	0.914	0.701	0.690	0.735	0.590
	IJ4	0.636	0.832	0.662	0.591	0.625	0.595
PJ	PJ1	0.584	0.578	0.856	0.514	0.495	0.468
	PJ2	0.644	0.668	0.871	0.528	0.491	0.396
	PJ3	0.724	0.748	0.897	0.597	0.614	0.542
VFOR	VFOR1	0.487	0.543	0.545	0.822	0.516	0.443
	VFOR2	0.489	0.587	0.549	0.853	0.560	0.518
	VFOR3	0.429	0.628	0.516	0.824	0.580	0.510
	VFOR4	0.498	0.579	0.467	0.809	0.564	0.536
VFROM	VFROM1	0.644	0.736	0.546	0.635	0.901	0.718
	VFROM2	0.588	0.679	0.526	0.564	0.902	0.700
	VFROM3	0.604	0.641	0.506	0.601	0.873	0.648
	VFROM4	0.572	0.669	0.563	0.536	0.802	0.597
WTC	WTC1	0.563	0.610	0.478	0.541	0.681	0.879
	WTC2	0.595	0.618	0.493	0.565	0.707	0.901
	WTC3	0.545	0.474	0.390	0.409	0.573	0.787
	WTC4	0.567	0.617	0.481	0.554	0.657	0.855

Table 5. Summary of Hypotheses Tests

Hypothetical NO.	Hypothetical Path	Original Sample	Standard Deviation (STDEV)	T Statistics (O/STERR)	Supported?
H1a	DJ -> VFOR	0.017	0.112	0.149	No
H1b	DJ -> VFROM	0.266	0.097	2.744	Yes
H2a	PJ -> VFOR	0.201	0.121	1.654	NO
H2b	PJ -> VFROM	-0.074	0.101	0.734	NO
H3a	IJ -> VFOR	0.542	0.102	5.300	Yes
H3b	IJ -> VFROM	0.640	0.097	6.620	Yes
H4	VFROM -> VFOR	0.314	0.319	3.466	Yes
H5a	VFOR -> WTC	0.169	0.113	1.498	NO
H5b	VFROM -> WTC	0.653	0.089	12.080	Yes