

The effect of inter-organizational justice perceptions on organizational citizenship behaviors in construction projects



Benson T.H. Lim ^{*}, Martin Loosemore

Faculty of Built Environment, University of New South Wales, West Wing Red Centre Building, Kensington Campus, Sydney, NSW 2052, Australia

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Abstract

Project management literature has long argued that inter-organizational justice is a key driver of successful construction project delivery. It is argued that when people believe business transactions are fair, they are more likely to exhibit positive organizational citizenship behaviors such as working harmoniously, giving discretionary effort, respecting others, and collaborating to resolve problems. However, there has been little empirical evidence to support these assertions. To address this knowledge gap, an online survey of 135 consultants, contractors, subcontractors, and suppliers from across the construction project supply chain was undertaken. The results show that project participants' organizational citizenship behaviors are influenced by their perceived interpersonal justice in business transactions. However, the findings also offer a more nuanced understanding of the complexities and inter-connectedness of these relationships in showing how one type of inter-organizational justice acts on another in influencing project organizational citizenship behaviors. The results indicate that interpersonal justice is a key ingredient in bringing about positive organizational citizenship behaviors in construction projects and that project performance can be enhanced if project managers treat project participants with politeness, respect, and dignity.

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1. Introduction

Over many decades, the discourse of construction project management has been replete with recommendations for the industry to move towards less confrontational, fairer, and more collaborative working practices (Latham, 1994; Walker and Rowlinson, 2008; Walker and Lloyd-Walker, 2011). Proponents of this approach point to the successful implementation of collaborative and relational procurement methods such as alliances as evidence shows that fairer working practices can benefit project performance, especially when supported by legislation such as Australia's Security of Payment Act (NSW) 1999 or soft

instruments such as the UK's Supply Chain Payment Charter. All these initiatives have placed considerable emphases on promoting inter-organizational justice with the aim of developing the organizational citizenship behaviors of project participants for improved project performance. Inter-organizational justice (or also known as inter-firm justice) refers to the perceived fairness by which project participants feel that they have been treated in terms of procedures (procedural justice), rewards (distributive justice), information exchange (informational justice), and interpersonal treatment (interpersonal justice) (Colquitt, 2001). Organizational citizenship behaviors (OCBs) are those discretionary behaviors that help in promoting the effective functioning of an organization (Organ, 1988a) and are important because they are key enablers for improved organizational performance (Podsakoff et al., 1997). In construction, as suggested by Fellows (2009), a construction project can be defined as a temporary multi-organization that comprises different project

* Corresponding author.

E-mail addresses: b.lim@unsw.edu.au (B.T.H. Lim),
M.Loosemore@unsw.edu.au (M. Loosemore).

participants who are its peripheral employees, and that the ways in which those project participants perceive they have been treated could affect their citizenship behaviors, hence the overall project performance. Hereafter, the terms “OCBs” and “citizenship behaviors” are used interchangeably.

Despite the promotion of collaborative and relational approaches to construction project management, limited research has been conducted to explore the relationship between inter-organizational justice and OCBs in the construction and wider project management literature. Thus, there is little understanding of the mechanisms by which inter-organizational justice can be translated into OCBs and in turn positive project performance. For example, Kadefors (2005) investigated the role of fairness in inter-firm relations by examining the distributive, procedural, and interactional justice of two Swedish projects based on their contractual and procurement arrangements. Aibinu (2006) established the relationship between distribution of control, perceived lack of fairness and dispute based on two case study projects. Subsequently, Ng et al. (2007) embraced the concepts of distributive and procedural justice to develop a dynamic conflict project management system that involved a five-step dispute resolution process. In investigating the role of emotional attachment in construction projects, Dainty et al. (2005) related the notions of project affinity and chemistry to OCBs and claimed that participants’ connection and commitment to project outcomes influenced the way in which the participants worked and their OCBs. Later on, Aibinu et al. (2008) demonstrated the interaction effect of procedural justice and outcome favorability on the cooperative behaviors of Singaporean construction contractors, and Aibinu et al. (2011) also found that perceived justice of outcome is a significant factor driving levels of conflicts and disputes on Singaporean construction projects. More recently, Loosemore and Lim (2015) explored the dimensions of inter-organizational justice and the level of fairness across different construction project types arguing that perceptions of inter-organizational justice between project participants are influenced mainly by the way that rewards are distributed, procedures followed, information communicated, and interpersonal relations conducted. However, like the other researchers cited above, Loosemore and Lim (2015) did not explore the inter-relationships between those dimensions of inter-organizational justice and how each of these dimensions could collectively affect participants’ OCBs, thus leaving us with a poor conceptual understanding of how inter-organizational justice affects OCBs. This is an important gap in project management knowledge to explore since by better understanding the different dimensions of perceived inter-organizational justice and their impacts on project participants’ OCBs, more targeted project management strategies can be developed to improve project performance. To this end, the aim of this paper is to examine the relationship between project participants’ perceived inter-organizational justice and their OCBs. This is achieved through (1) a review of research in the wider field of mainstream behavioral research which has explored the concepts of organizational justice and OCBs and (2) an online questionnaire survey of 135 construction professionals in Australia.

2. Literature review

2.1. Organizational justice

Since Rawls’ (1958) early publication of justice as fairness, there has been an ongoing debate as to how justice takes place in practice, and if it should be treated as a single- or multiple-dimensional concept. While this debate still goes on, it is widely accepted that there are four main forms of justice which exist in any organization: procedural, distributive, informational, and interpersonal. In this study, procedural justice refers to participants’ perceived justice about the policies, processes, and procedures through which decisions were made in construction projects (Thibaut and Walker, 1975). Distributive justice refers to the perceived justice about the allocation of rewards received by project participants based on their inputs given (Folger and Konovsky, 1989). Interpersonal and informational justice refer to the degree to which participants were treated with politeness, respect, and dignity (Bies and Moag, 1986) and the quality of information exchange among the participants during enactment of decisions (Greenberg, 1993), respectively.

A considerable amount of research has sought to explain how justice affects organizational performance, mostly outside the construction and project management domains. For example, Thibaut and Walker’s (1975) work on individual’s reactions to dispute resolutions procedures, which led to the subsequent development of procedural justice, showed that fairness of decision-making policies and practices is an important consideration for individuals. Other studies have also shown that people’s judgment of procedural fairness is characterized by (1) their ability to voice views and influence decision outcomes (Colquitt, 2001), (2) if the decisions were made based on accurate information (Leventhal, 1980), and (3) if the decision-making processes were (i) consistent (Leventhal, 1980; Moorman, 1991), unbiased (Leventhal, 1980; Luo, 2007), (iii) ethical (Leventhal, 1980; Folger and Konovsky, 1989), and (iv) clear and transparent (Folger and Konovsky, 1989; Luo, 2007). These authors indicate that if these criteria are met in project relations, then individuals will respond positively by accepting the project manager’s authority and becoming more willing to comply with rules, decisions, and work collaboratively towards project outcomes. This further supports Welbourne et al. (1995) and Hauenstein et al.’s (2001) conclusions that procedural and distributive justice are highly associated and undifferentiated. However, researchers (e.g. Adams, 1965; Walster et al., 1978) argued that distributive justice should be perceived differently from procedural justice as distributive justice concerns fairness in (i) resource allocation, (ii) people’s contribution and rewards for work done, and (iii) commensuration of rewards with the risks taken, effort, ability, and experience.

Adding to the complexity above, Bies and Moag (1986), Lind and Tyler (1988), and Greenberg (1990) conceptualized interactional justice as the social aspects of procedural and distributive justice, arguing that people’s perception of fairness are constantly affected by their relationships and communications around them. In accepting this, researchers suggested that interactional justice

is made up of two subcomponents: informational and interpersonal justice (Greenberg, 1993; Colquitt, 2001). Informational justice is built around the rules of truthfulness and justification and will exist when (i) there was adequate information and explanation for decisions made, (ii) people were involved in decision-making processes (Cohen-Charash and Spector, 2001), and (iii) communications are made in a timely and transparent manner (Luo, 2007). In contrast, interpersonal justice emphasizes the value of equality and is likely to exist when people felt being valued and treated with dignity, politeness, and respect (Bies and Moag, 1986; Tyler and Bies, 1990), and when there is freedom of thought, association, and expression, and overall high opinion for people's health, safety, dignity, and rights (Rawls, 1971; Tyler, 2000; Helmy, 2013).

2.2. Organizational citizenship behaviors

The concept of organizational citizenship behaviors (OCBs) has been widely studied in the field of industrial and organizational psychology (Podsakoff et al., 2000) but is relatively new in construction. Organ's (1988a) initial work on "The Good Soldier Syndrome" shows that OCBs comprises five dimensions: conscientiousness (i.e. behaviors that go beyond those expected by specific role requirements), altruism (i.e. behaviors that help other members), civic virtue (i.e. behaviors that entail political participation), sportsmanship (i.e. behaviors that avoid complaining and/or aggravating unpleasant situations), and courtesy (i.e. behaviors that prevent problems from occurring).

Organ (1988a, 1988b, 1990) and Moorman et al. (1993) shared that people's perceptions of justice are highly associated with OCBs because such perceptions are influential towards developing the levels of trust and motivation needed for employees to bring about the beneficial, yet discretionary, behaviors that define citizenship. Moorman (1991) also found that people's perceived interpersonal justice positively influenced their citizenship behavior (altruism, courtesy, sportsmanship, and conscientiousness) and Williams et al. (2002) and Rego and Cunha (2010) found that people's OCBs are significantly influenced by their impressions of fair interactions around them (interpersonal justice), rather than their perceptions of fair rewards (distributive justice) and fair formal procedures (procedural justice). On the other hand, Niehoff and Moorman (1993) and Moorman et al. (1993) argued that people's perceived procedural justice play a more important role than their perceived interactional justice towards influencing their OCBs such as courtesy, sportsmanship and conscientiousness. Similarly, when examining the relationships between procedural justice and managers' behaviors, Kim and Mauborgne (1996) found that the exercise of fair procedures in organizations will inspire managers to perform citizenship behaviors, engaging in innovative actions, spontaneous cooperation, and creative actions. Skarlicki and Folger's (1997) analyses of the relationship between employees' perception of justice and their anti-citizenship behaviors have shown that the presence of unfair procedures is likely to escalate employees' withdrawal of citizenship behaviors against unfair outcomes, particularly when there is low interpersonal justice. However,

the authors also found that when supervisors display high level of interpersonal justice, employees are more willing to tolerate the combination of an unfair pay distribution and unfair procedures. Cohen-Charash and Spector (2001) later conducted a meta-analysis on 190 past studies to ascertain the correlation between distributive, procedural and interactional justice, job satisfaction, OCBs, and anti-citizenship behaviors. They found that people's perceived procedural and distributive justice is closely related to their OCBs such as conscientiousness, altruism, commitment, engagement, loyalty, willingness to go the extra mile, and willingness to give discretionary effort. However, their findings also showed that, when experiencing injustice, people's perceptions of procedural injustice are more destructive than their perceptions of distributive and interpersonal injustice towards triggering their anti-citizenship behaviors such as withdrawal, reduced effort, anger, sabotage, and retaliation. This is further reinforced by Fox et al. (2001) and Pablo (2010), who found that people's perceived procedural injustice is strongly correlated with their negative emotion and anti-citizenship. More recently, Beauregard's (2014) analyses of employees' fairness perceptions of work-life balance initiatives also showed that people's perception of informational injustice could bring about anti-citizenship behaviors.

The review above reveals that the relationships found between citizenship behaviors and the different forms of justice have been complex and often contradictory. Furthermore, those studies cited above were conducted in the industrial and organizational contexts with none being conducted in the construction project management context. This thus makes it very difficult for project managers to articulate, contextualize, and implement these ideas in practice.

3. Hypothesis development and rationale

Hitherto, numerous theoretical positions have been taken by researchers to investigate the relationships between people's justice perception and citizenship behaviors. These include social exchange theory (see Blau, 1964), equity theory (see Adams, 1965), and fairness theory (see Folger and Cropanzano, 2001). These theories form the theoretical underpinning for this study, explaining how construction project participants perceive justice and how their justice perception could interact and in turn affect their citizenship behaviors.

From the social exchange perspective, as suggested by Organ (1988a), people see working relationships as forms of social and economic exchange, and if they judge the relationships as more social than economic, then there are positive spill-over effects on other job-related matters and citizenship behaviors. In accepting this, each construction project involves a process of negotiated exchanges between project participants and that these exchanges could exist as either social relations or economic transactions or both. It is therefore important for project managers to understand how project participants perceive and thereafter react to those complex exchanges. For example, if project participants defined their exchanges as social relations whereby they felt they had

been treated with politeness, respect, and dignity, would they be more likely to be optimistic on other project-related issues (such as procedures, rewards, and informational exchange) and engage in citizenship behaviors? In addressing this, the following hypotheses have been formulated:

H1a. *Participants' perception of interpersonal justice has positive impact on their perceived distributive justice.*

H1b. *Participants' perception of interpersonal justice has positive impact on their perceived procedural justice.*

H1c. *Participants' perception of interpersonal justice has positive impact on their perceived informational justice.*

H1d. *Participants' perception of interpersonal justice has positive impact on their OCBs.*

On the other end, as theorized by Adams (1965) and Blau (1964), people need to feel that there is a reasonable equal balance between their inputs and rewards received. If not, they will react negatively. Interestingly, this raises another question whether project participants' OCBs will be affected by how fair they perceive those procedures and rewards were during their project delivery. Furthermore, by comparing the results of H2a and H2b below and those hypotheses above, this could help inform project managers if project participants' behaviors are more socially or economically driven, and thus allows them to develop targeted project management strategies for improved performance.

H2a. *Participants' perception of distributive justice has positive impact on their OCBs.*

H2b. *Participants' perception of procedural justice has positive impact on their OCBs.*

Lastly, from the lens of fairness theory, Folger and Cropanzano (2001) pointed out that overemphasizing reward distribution (as denoted by H2a and H2b) and ignoring people's reaction to the way how decisions were made is a serious oversight. They highlighted that people who suffered injustice will respond very negatively to unfavorable outcomes caused by the discretionary action of another person and if there is any violation of standard behaviors during the enactment of negotiated exchanges. This further casts an interesting question as to how project participants would react to some common project issues such as lack of clarity in scopes and responsibilities, and lack of information and communications. Would they refer these issues closely to those processes and rewards received and thereafter engage in anti-citizenship behaviors? In addressing this, the following hypotheses have been formulated:

H3a. *Participants' perception of informational justice has positive impact on their perceived distributive justice.*

H3b. *Participants' perception of informational justice has positive impact on their perceived procedural justice.*

H3c. *Participants' perception of informational justice has positive impact on their OCBs.*

In practice, the hypotheses above are important because project managers need to know how perceptions of inter-organizational justice affect each other and how these then affect the OCBs of those they seek to manage. As discussed above, the literature outside construction shows that this is complex and unclear at present and there is no construction research literature for project managers to draw on. So the clarification of the above postulated relationships will go some way to better understand and then operationalize this important relationship. For example, if we discover that there is a hierarchy of causation between the different types of inter-organizational justice, then project managers know where to start in managing participants' citizenship behaviors.

4. Method

To investigate the above hypotheses, an online structured questionnaire survey was undertaken with representatives from across the construction supply chain in Australia. The structured questionnaire survey was developed by using a series of exploratory interviews with practitioners and researchers, which were specifically designed to help contextualize and formalize items for measuring the concepts of inter-organizational justice and citizenship behaviors.

In the first section, respondents were asked to provide general information about their current job title, company's annual turnover, and the role of their company and the type of work on last project and its contract value. In the second section, they were asked to rate 29 statements about how they felt their company had been treated and the overall work environment on their last construction project, on a 7-point Likert scale ranging from 1—strongly disagree to 7—strongly agree. In the final section, they were requested to rate the five OCB items based on a 7-point Likert scale of 1—very low and 7—very high. In this study, four of the five OCBs types proposed by Organ (1988a) were re-contextualized from “civic virtue” to “commitment,” “sportsmanship” to “social engagement,” “altruism” to “discretionary/voluntary effort,” and “courtesy” to “respect for others.” For the survey, the questions were directed at the respondent's most recent project to minimize recall error (Huber and Power, 1985) and thus enable us to draw reliable statistical associations between perceptions of inter-organizational justice and OCBs. Furthermore, an introductory page was included in the online survey to remind respondents that (1) they must have experiences in managing, at least, a project from its initial stage to project closure, in order to participate in this research and (2) they should answer individual questions based on the factual situations that took place on their most recent project regarding how their company had been treated by their project principal or client throughout the project period. The online structured questionnaire was pilot-tested with a smaller sample of industry practitioners and refined before the main industry-wide survey was undertaken.

In identifying respondents for the survey a simple probability sampling method was adopted with a sample frame generated from Building Construction Information Australia's (BCI) database of

50,000 professionals from different construction industry disciplines (e.g. architects, contractors, consultants, subcontractors, and suppliers) within the industrial, residential, commercial, public and mining sectors in Australia (for further details, see <http://www.bciaustralia.com/>). After ethics approval was received from UNSW, initial email invitations with the survey link were sent to targeted respondents via BCI's central emailing system, explaining the aim of the study and assuring anonymity and confidentiality. Thereafter, in an attempt to increase the response rate, follow-up emails were sent out after 2 weeks from the initial invite. Eventually, a total of 135 valid responses were collected. Sixty-seven (50%) of the 135 respondents were senior management (comprising owners, CEO and directors), 49 (35%) were middle management (e.g. general managers, state managers, and senior project managers), and the rest were from operational level (e.g. estimators, surveyors, and contract administrators). Also, the majority of the respondents' companies (70%) had an annual turnover ranging from \$1 to 50 million, and the rest with a turnover of more than \$50 million. Most of these were engaged as subcontractors (41%) and trade consultants (25%), main contractors (23%), suppliers (22%), and developers (3%).

5. Data analysis

Structural equation modeling (SEM), a second-generation of multivariate statistical technique, was adopted here as the main data analytical method because it (1) combined both econometric and psychometric perspectives in statistical modeling attempt; (2) allowed estimation of simultaneous relationships among predictor and predicted constructs, characterized by their respective block of measurement items; and (3) enabled maximally efficient fit between data and a structural model since both confirmatory factor analysis and path analysis are executed simultaneously in a single structural equation model. These conditions are difficult to fulfill in data analysis and modeling using the first-generation multivariate statistical techniques such as multiple regression, ANOVA, and canonical correlation.

Of the two types of SEM-based methods, the partial least square (PLS)-SEM approach, was chosen over the covariance-based SEM approach. The justifications for using the PLS-SEM approach are as follows: (1) it is more oriented towards predictive application and best used for the exploratory nature of this study (Joreskog and Wold, 1982); (2) it tends to estimate constructs as linear combinations of measurement items using weight relations, thus avoiding the indeterminacy and providing an exact definition of constructs' scores (Chin, 1998); and (3) it can analyze a more complex model than the latter, without requiring a large sample size (30–100 datasets) and rigorous restrictions on data distribution (Fornell and Bookstein, 1982). Furthermore, PLS-SEM is distribution free (Falk and Miller, 1992), and hence is more appropriate for this study considering that all measurement items (summarized in Table 1) are of perception based and unknown distribution. Indeed, over the past decade, the PLS-SEM approach has been widely adopted by construction researchers (e.g. Aibinu et al., 2008, 2011; Lim

et al., 2011, 2012) to examine the multiple and interdependence relationships of constructs in a similar context of this study.

In this study, several approaches were undertaken to assess the reliability and validity of constructs, and the explanatory power of the structural model. To test data reliability, Harman's (1967) one-factor test was first performed to detect any presence of common method variance, and a 4-factor solution was detected with 77.363% of the variance being explained. Furthermore, no single factor has accounted for more than 20% of the variance in the data, thus indicating that the problem of common method variance is not significant in this study.

Thereafter, a two-stage process was adopted to validate the uni-dimensionality and adequacy of respective constructs (following the techniques adopted by Lim et al. (2011, 2012)). The first stage involved an iterative process of conducting the exploratory factor analyses (EFA) and Cronbach's alpha tests to identify and remove outliers until item reliability and construct validity were achieved. All remaining items were then put through the confirmatory factor analysis (CFA) so as to attain a stricter and more objective interpretation of the unidimensionality of respective constructs, by looking at their inferential statistics. In this study, several guidelines were adopted to confirm the item reliability and construct validity: (1) factor loading must be at least 0.55 (Comrey, 1973) and significant at $p < 0.05$ (Anderson and Gerbing, 1988); (2) Cronbach's alpha coefficient must be at least 0.70 (Nunnally, 1978); (3) composite reliability score must be at least 0.70 (Hair et al., 1998); (4) average variance extracted (AVE) value must be at least 0.50 and the square-rooted AVE scores of respective pair of constructs must be greater than their correlation coefficients (Fornell and Larcker, 1981); (5) the AVE value of respective construct must be greater than its Maximum Shared Squared Variance (MSV) Average Shared Square Variance (ASV) values (Fornell and Larcker, 1981; Hair et al., 1998); and (6) the Heterotrait–Monotrait ratio of Correlation (i.e. HTMT) value should be below 0.90 (Hair et al., 2014). In this research, a threshold factor loading of 0.55 was chosen because measurement items of individual constructs are exploratory in nature and borrowed from mainstream literature. Comrey (1973) pointed out that measurement items with loadings 0.55–0.60 could be considered as good and consistent. Furthermore, individual constructs should comprise at least three measurement items in order to be considered as a valid construct with reasonable level of reliability in this study (following the techniques adopted by Lim et al. (2011, 2012)). The results of the two-stage construct validation process have been summarized in Table 1 and discussed in Section 6.1.

Following the process above, changes were made to the hypotheses presented in Section 3 as the EFA and CFA test results point to the single dimensionality of distributive and procedural justice. For this, H1a, H1b, H2a, H2b, H3a, and H3b were integrated into H1^{ab}, H2^{ab}, and H3^{ab}, respectively. A structural model was then built to test the hypotheses using the path analysis technique (see Fig. 1) and its explanatory power was evaluated by examining the amount of variance (R^2) accounted for by the predictor constructs for each predicted construct. Furthermore, the statistical significance of path

Table 1
Construct validation results.

Item code	Description	Constructs							
		DPJ		IPJ		ITJ		OCB	
		EFA	CFA	EFA	CFA	EFA	CFA	EFA	CFA
<i>Interpersonal justice (IPJ) [$\alpha = 0.944$; CR = 0.953;]</i>									
F1	We were treated with politeness	0.26 (0.25)	0.63	0.69 (0.69)	0.87 [34.72 *]	0.32 (0.30)	0.69	0.32 (0.32)	0.58
F2	We were treated with dignity	0.31 (0.30)	0.66	0.79 (0.79)	0.91 [50.88 *]	0.28 (0.26)	0.70	0.18 (0.18)	0.49
F3	We were treated with respect	0.39 (0.39)	0.73	0.72 (0.74)	0.91 [65.82 *]	0.35 (0.31)	0.75	0.17 (0.17)	0.48
F4	Our opinions were valued	0.37 (0.37)	0.66	0.57 (0.58)	0.81 [27.36 *]	0.41 (0.40)	0.71	0.13 (0.13)	0.41
F5	We had a good relationship with our client	0.35 (0.35)	0.68	0.69 (0.71)	0.85 [32.12 *]	0.36 (0.34)	0.72	0.08 (0.08)	0.4
F6	We had freedom of expression	0.43 (0.40)	0.69	0.56 (0.57)	0.81 [23.08 *]	0.32 (0.29)	0.70	0.21 (0.21)	0.46
F7	We had freedom of association	0.19 (0.18)	0.54	0.60 (0.60)	0.78 [19.50 *]	0.32 (0.31)	0.63	0.37 (0.37)	0.56
F8	There was respect for people's health and safety	0.17 (0.16)	0.46	0.73 (0.72)	0.71 [14.61 *]	0.11 (0.10)	0.50	0.13 (0.13)	0.38
F9	There was respect for people's dignity and rights	0.28 (0.27)	0.63	0.72 (0.72)	0.82 [25.62 *]	0.30 (0.28)	0.68	0.15 (0.15)	0.44
<i>Informational justice (ITJ) [$\alpha = 0.957$; CR = 0.965;]</i>									
F10	We had an adequate say	0.47 (0.45)	0.70	0.42 (0.44)	0.71	0.64 (0.61)	0.91 [47.66 *]	0.20 (0.19)	0.48
F11	Communications were open and transparent	0.32 (0.32)	0.70	0.46 (0.48)	0.72	0.64 (0.62)	0.86 [36.88 *]	0.15 (0.15)	0.43
F12	We were kept informed about major decisions that affected our interests	0.37 (0.37)	0.73	0.35 (0.37)	0.72	0.76 (0.74)	0.93 [57.83 *]	0.12 (0.12)	0.41
F13	We were given adequate information to be able to undertake our jobs effectively	0.37 (0.37)	0.70	0.28 (0.30)	0.68	0.74 (0.71)	0.87 [31.81 *]	0.12 (0.11)	0.38
F14	Decisions that affected us were explained to us	0.36 (0.34)	0.72	0.35 (0.36)	0.72	0.76 (0.73)	0.92 [61.76 *]	0.15 (0.14)	0.42
F15	We were consulted about decisions that affected our interests	0.38 (0.37)	0.76	0.40 (0.42)	0.77	0.74 (0.71)	0.95 [79.01 *]	0.17 (0.16)	0.45
<i>Distributive and procedural justice (DPJ) [$\alpha = 0.966$ (0.96); CR = 0.970;]</i>									
F16	We were rewarded fairly for the work that we did	0.72 (0.69)	0.87 [40.06 *]	0.41 (0.42)	0.71	0.26 (0.21)	0.7	0.11 (0.10)	0.39
F17	The risks we were asked to take were fair and commensurate with our ability to manage them	(0.42)		(0.36)		(0.17)		(0.08)	
F18	We had opportunities to share in the rewards from any improvements we brought into the project	0.67 (0.63)	0.74 [13.20 *]	0.32 (0.31)	0.57	0.14 (0.12)	0.57	0.11 (0.10)	0.34
F19	We were resourced adequately to do our job effectively	(0.36)		(0.01)		(0.19)		(0.18)	
F20	Contracts were fair and equitable	0.61 (0.58)	0.83 [25.11 *]	0.31 (0.33)	0.67	0.44 (0.38)	0.74	0.18 (0.16)	0.43
F21	Our rewards were commensurate with our inputs, effort, ability and experience	0.79 (0.76)	0.87 [36.52 *]	0.3 (0.31)	0.63	0.21 (0.17)	0.66	0.11 (0.10)	0.38
F22	Disputes were resolved fairly The processes by which risks and rewards were distributed were:	0.55 (0.54)	0.81 [21.05 *]	0.45 (0.47)	0.73	0.43 (0.39)	0.76	0.1 (0.09)	0.4
F23	fair	0.84 (0.83)	0.94 [79.74 *]	0.32 (0.34)	0.7	0.26 (0.23)	0.72	0.15 (0.14)	0.44
F24	consistent	0.73 (0.74)	0.70 [11.03 *]	0.01 (0.02)	0.44	0.19 (0.21)	0.48	0.19 (0.20)	0.34
F25	based on accurate information	0.79 (0.79)	0.90 [43.90 *]	0.23 (0.24)	0.65	0.37 (0.38)	0.73	0.13 (0.13)	0.4
F26	negotiable	0.76 (0.75)	0.84 [26.48 *]	0.34 (0.34)	0.66	0.15 (0.15)	0.62	0.18 (0.18)	0.43
F27	ethical	0.80 (0.80)	0.93 [72.74 *]	0.35 (0.37)	0.72	0.26 (0.24)	0.71	0.16 (0.16)	0.45
F28	transparent	0.73 (0.73)	0.90 [41.41]	0.22 (0.24)	0.69	0.47 (0.47)	0.78	0.21 (0.22)	0.47
F29	clear	0.75 (0.75)	0.90 [28.88 *]	0.22 (0.24)	0.67	0.47 (0.48)	0.77	0.12 (0.12)	0.39
<i>OCBs [$\alpha = 0.931$; CR = 0.945]</i>									
OCB1	Conscientiousness	0.18 (0.17)	0.38	0.10 (0.10)	0.40	0.14 (0.13)	0.36	0.88 (0.88)	0.86 [19.61 *]
OCB2	Commitment	0.11 (0.11)	0.31	0.08 (0.10)	0.34	0.08 (0.07)	0.30	0.93 (0.92)	0.88 [25.06 *]
OCB3	Social engagement	0.15 (0.14)	0.43	0.21 (0.21)	0.49	0.22 (0.21)	0.46	0.86 (0.85)	0.89 [34.17 *]
OCB4	Discretionary/voluntary effort	0.12 (0.11)	0.32	0.22 (0.22)	0.38	0.00 (-0.02)	0.29	0.81 (0.81)	0.84 [25.04 *]
OCB5	Respect for others	0.26 (0.29)	0.53	0.47 (0.47)	0.63	0.15 (0.14)	0.52	0.59 (0.59)	0.82 [24.57 *]

NB: α and CR denote Cronbach's Alpha and composite reliability, respectively; the values in parenthesis are factor loadings before the trimming exercise during EFA; the values in brackets are the t-statistics of respective measurement generated during CFA.

* $p < 0.05$.

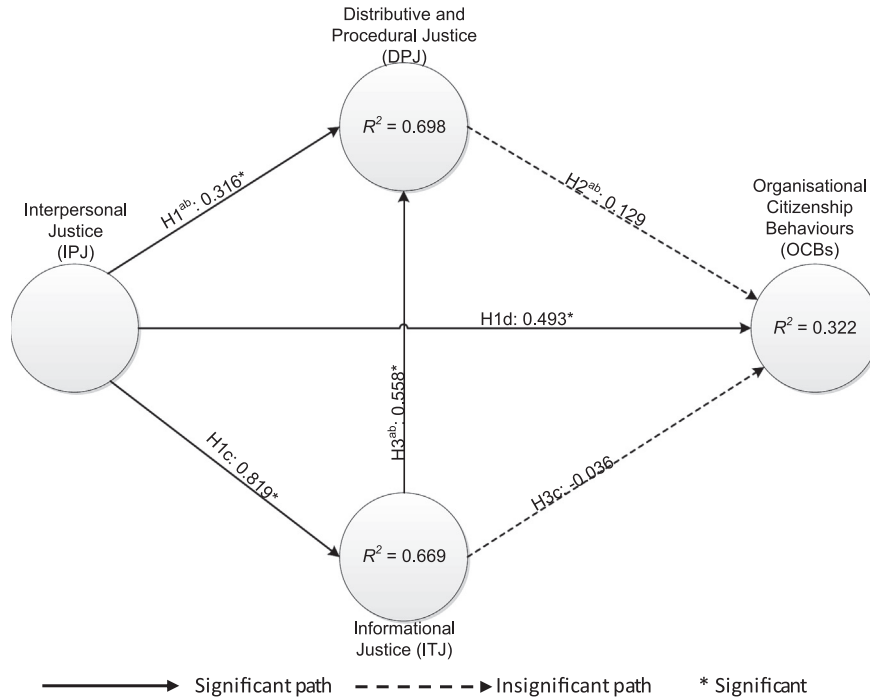


Fig. 1. Structural model and its test results.

coefficients (i.e. the strength of those hypothesized relationships) was determined by their respective *t*-statistics generated based on the bootstrapping process of 5000 samples in the SmartPLS 3 software (as suggested by Hair et al. (2014)).

For the structural model evaluation, four guidelines were adopted: (1) a predictor construct must explain at least 1.5% of the variance in a predicted construct; otherwise, the predictor construct should be eliminated and the model will be re-estimated (Falk and Miller, 1992); (2) a predictor construct’s R^2 value of 0.75, 0.50, and 0.25 will be considered as substantial, moderate, and weak, respectively (Hair et al., 2014); (3) a predictor construct’s tolerance (VIF) value should be at least 0.20 (or lower than 5) (Hair et al., 2014); and (4) a predictor construct’s f^2 value of 0.02, 0.15, and 0.35 will correspondingly indicate small, medium, or large effect on a predictor construct (Hair et al., 2014).

6. Results

6.1. Construct validation

From Table 1, the results show that inter-organizational justice could be classified into “Distributive and Procedural Justice (DPJ),” “Interpersonal Justice (IPJ),” and “Informational Justice (ITJ).” Two (i.e. F17 and F19) out of the 29 measurement items were found to be inconsistent and thus were deleted for subsequent analyses (see the EFA and CFA columns of Table 1).

After the trimming process, it can be seen that all measurement items of the four constructs are reliable, characterized by their significant factor loadings greater than 0.55 (ranging from 0.70 to 0.95) at $p < 0.05$, their Cronbach’s alpha scores of greater than 0.70 (ranging from 0.931 to 0.966), and their composite

reliability scores of greater than 0.70 (ranging from 0.902 to 0.969). Also, it can be seen that respective measurement items have loaded higher on the construct that they were specified to measure than any other constructs. Furthermore, Table 2 shows that the HTMT values of respective constructs are below 0.90 and that their square-rooted AVE values are considerably greater than any of the correlation coefficients presented in the corresponding rows and columns. Lastly, the results in Table 2 reveal that the AVE values for all constructs are greater than 0.50 (ranging from 0.693 to 0.823) and that their AVE values are also greater than their MSV and ASV values. Collectively, all these provide strong evidence of convergent and discriminant validity in respective constructs.

From Table 1, it can be seen that the first construct is related to participants’ perception of “Distributive and Procedural Justice (DPJ),” which is characterized by 12 items (F16, F18, F20–F29) with significant factor loadings ranging from 0.70 to 0.94 at $p < 0.05$. This indicates that project participants felt that disputes were resolved fairly (F22), rewards received were fair and commensurate (F16 and F21), and contracts were fair and

Table 2
Comparison of correlations and square-rooted AVE of constructs.

	MSV	ASV	AVE	DPJ	ITJ	IPJ	OCBs
DPJ	0.666	0.498	0.730	0.855			
ITJ	0.669	0.520	0.823	(0.847)	0.832		
IPJ	0.669	0.526	0.693	(0.802)	0.771	(0.856)	0.907
OCBs	0.372	0.257	0.741	(0.493)	0.482	(0.476)	0.473
						(0.571)	0.561

NB: the bolded diagonal values are the square-rooted AVE score of each construct. Off diagonal elements are the correlations between construct. Values in parentheses are HTMT values. MSV and ASV denote Maximum Shared Squared Variance and Average Shared Square Variance, respectively.

equitable (F20) when the decision-making processes were fair (F23), consistent (F24), based on accurate information (F25), negotiable (F26), ethical (F27), transparent (F28), and clear (F28). These findings are in line with those of Folger (1986), Greenberg (1987), Tyler (2000), and Cropanzano and Ambrose (2001), highlighting that procedural and distributive justice are highly related because people judge the extent of justice in procedures based on the rewards they received.

Turning to the second construct, Table 1 shows that “Interpersonal Justice (IPJ)” is characterized by nine measurement items (i.e. F1–F9), which have significant factor loadings ranging from 0.71 to 0.91 at $p < 0.05$. The findings indicate that project participants significantly perceived and evaluated interpersonal justice based on a set of individual and collective perceptions around: the quality of relationship among relevant participants (F5), the freedom of association and expression (i.e. F6 and F7) and level of politeness (F1), dignity (F2) and respect (F3) the participants experienced, and the overall level of respect for people’s opinion (F4), health, safety (F8), dignity and rights (F9) in the projects. These findings are in line with those of Ashkanasy and Daus (2002) and Cameron and Green (2004), whose research also shows that people’s perceptions of interpersonal justice are, to some extent, influenced by co-workers within their respective groups and that these groups are bounded together in a network that interconnect in various ways.

The third construct refers to “Informational Justice (ITJ)”; our findings show that it is characterized by six measurement items (F10–F15) with significant factor loadings ranging from 0.86 to 0.95 at $p < 0.05$. The findings reveal that informational justice is underpinned by a two-way open and transparent communication and information exchange (F11), whereby project participants would expect being informed and consulted of the major decisions that affected their interest (F12 and F15), and having the decisions being explained to them (F14), as well as being given adequate information for their task performance (F13). Thereafter, they should be given adequate say to negotiate or challenge the decisions made (F10).

Lastly, the fourth construct is related to “Organizational Citizenship Behaviors (OCBs)” and is characterized by five measurement items (OCB1–OCB5) with significant factor loadings ranging from 0.82 to 0.89 at $p < 0.05$. The finding supports the conceptualization of Organ (1988a) and Porter et al. (2003), pointing out that when people become highly engaged (OCB3) in a work environment, they tend to have a higher degree of respect for others (OCB5), increase their discretionary efforts (OCB4), and become more conscientious (OCB1) and committed (OCB2) to performing their work.

6.2. Path analysis

The path analysis results of the structural model are summarized in Table 3 and Fig. 1. Table 3 shows that each of the predictor constructs has accounted for at least 1.5% of the total variance explained in their respective predicted constructs and that the three predicted constructs (i.e. DPJ, ITJ, and OCBs) have R^2 values ranging from 0.322 to 0.698;

thus, an average R^2 value of 0.563 is obtained. In addition, the test results show that all predictor constructs have a VIF tolerance value of less than 5, ranging from 3.019 to 4.015, therefore implying that collinearity is not a problem in this study. All these collectively indicate that all predictor constructs are informative and have moderately explained the variance in their predictor constructs. For the hypotheses testing, a one-tail test was used. The results in Table 3 reveal that four (i.e. H1^{ab}, H1c, H1d, H3^{ab}) are supported by the research findings while two (i.e. H2^{ab} and H3c) are not supported.

7. Discussions

Overall, it is found that project participants’ perception of interpersonal justice significantly affects their perceived informational justice, distributive and procedural justice, and OCBs. Also, their perceived interpersonal justice has indirect effect on their perceptions of informational justice on distributive and procedural justice. The picture which emerges from this research is that addressing interpersonal justice should be the priority of project managers and that if managers address project participants’ perceptions of informational justice and distributive and procedural justice, without addressing their perceived interpersonal justice, the impact on OCBs will then be limited. These results are discussed further below.

7.1. Relationships between dimensions of perceived inter-organizational justice

The results in Table 3 and Fig. 1 reveal that IPJ is a significant predictor of ITJ, as characterized by its R^2 value of 0.669, path coefficient (β) of 0.819, and f^2 value of 2.019. Generally, this means that the project participants’ perceived interpersonal justice have moderately explained 67% of (the variance in) their perception of informational justice, and thus by effectively managing their perception of interpersonal justice, it could significantly improve their perception about the quality of information exchange in the project environment. This finding supports Cheung (2013) and Chen et al. (2013), who found that good inter-firm relationships are an antecedent of effective information sharing across supply chain participants. Like Cheung (2013) and Chen et al. (2013), our results show that if people have good interpersonal relationship, they are more likely to trust each other for acting in good faith in their dealings and in turn are more willing to share, deliver, and exchange a wide variety of resource (including information). As implied by the measurement items of IPJ, the development and maintenance of a professional and respectful work environment is one of the key foundations towards creating camaraderie and developing trusting relationships in a project environment. As indicated by project management literature (e.g. Moore, 2002; Knapp, 2010), it is important for project managers to conduct their work and behave in an ethical and professional manner so as to set the right tone for their co-workers and gain respect among them and other project participants. At the same time, our results show that they should instill a culture of open and honest communication that allows

Table 3
Results of path analysis between inter-organizational justice and OCBs.

Hypothesis (H)	Proposed paths	Path coefficient, β	Total effect	Indirect effect (4)–(3)	P_v explained (3) \times correlation	f^2	R^2	Inference
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
H1c	IPJ \rightarrow ITJ	0.819 (33.390 **)	0.819 (33.390 **)	–	66.99%	2.019	0.669	S
H1 ^{ab}	IPJ \rightarrow DPJ	0.316 (3.699 **)	0.773 (22.2 **)	0.457 (6.216 **)	24.363%	0.122	0.698	S
H3 ^{ab}	ITJ \rightarrow DPJ	0.558 (6.576 **)	0.558 (6.576 *)	–	45.532%	0.363		S
H2 ^{ab}	DPJ \rightarrow OCBs	0.129 (0.972)	0.129 (0.972)	–	6.218%	0.018		N.S
H1d	IPJ \rightarrow OCBs	0.493 (3.568 **)	0.564 (10.024 **)	0.071 (0.630)	27.657%	0.117	0.322	S
H3c	ITJ \rightarrow OCBs	–0.036 (0.195)	0.040 (0.276)	0.073 (0.888)	–1.702%	0.012		N.S
					Average R^2		0.563	

NB: value in the parenthesis are t-statistics of respective effects or path coefficients; N and N.S denote supported and not supported, respectively.

* Significance at $p < 0.05$.

** Significance at $p = 0.000$.

project participants to voice their expression, socialize with one another, share their views, resolve conflicts as soon as they arise, and appreciate and respect the differences in individuals. By doing so, as highlighted by Cheung (2013), project managers could pass on clear messages to participants that the project temporary multi-organization genuinely cares about and has their best interests in mind.

Also, our findings show that project participants' perceptions of interpersonal and informational justice have collectively explained about 70% of (the variance in) their perceived distributive and procedural justice (with a moderate R^2 value of 0.698). Furthermore, we found that project participants' perceived informational justice ($\beta = 0.558$ and f^2 value = 0.363) has a greater direct impact on their perception of perceived distributive and procedural justice than their perceived interpersonal justice has ($\beta = 0.316$ and f^2 value = 0.122). These results mean that project participants are more likely to perceive procedures and rewards received being fairer when they have been given sufficient information to undertake their task and consulted of the decisions made, than when they have a good interpersonal relationship. These findings support those of Beauregard (2014) and Aquino et al. (1999), indicating that when people do not receive honest and full explanation regarding how the decisions were made, they are very likely to perceive the procedures and rewards received as unfair. Also, our findings support Aibinu (2009), whose analysis of delay and disruption claims conflict in construction shows that high quality of information exchange is likely to enhance the perceived quality of the decision-making process used for assessing and deciding the claims.

Interestingly, our findings also reveal that project participants' perception of interpersonal justice plays a more important mediating role than its direct influence on their perceived distributive and procedural justice, as characterized by its indirect effect of 0.457 and direct effect of 0.316 showed in columns 3 and 5 of Table 3. This could possibly mean that the presence of low perceived informational justice is likely to escalate participants' perception of distributive and procedural justice, particularly when there is a low perceived interpersonal justice. Furthermore, our findings, pointing to the total effects of IPJ on ITJ (0.819) and DPJ (0.773), could imply that when there is a perception of high interpersonal justice in a project

environment, participants would be more willing to tolerate the combination of an unfair information exchange and unfair procedures and rewards received. However, future research should be undertaken to further confirm these moderating effects of perceived interpersonal justice.

Conceptually, the picture that emerges from above help inform the fairness and social exchange theories in construction that people are more likely to directly associate the rewards received to the quality of information exchange than the quality of interpersonal relationship. However, it is hardly possible for people to be rational in an objective sense, particularly when they are engaged in social relations. On the practical side, these complex relationships of different types of perceived inter-organizational justice call for the attention of project managers in managing their participants whom they have good relationship with. They should not take the good interpersonal relationship for granted and neglect the need of sharing information with and explaining the decisions to the participants. Particularly in construction projects, informational justice seems to be a more attainable goal than interpersonal justice considering that it may be difficult for project managers to ensure that all project participants perceive the social interaction as fair as a result of the sequential nature of the construction activities and the difference in people's emotional and relational needs. On the other end, it is less difficult for project managers to notify relevant participants of decisions that could affect their interests and explain why those decisions were made. As such, further efforts to improve project participants' perceptions of distributive and procedural justice might be assisted by incorporating alternative routes by which the participants can express their discontent. For example, this may involve setting-up or strengthening feedback or grievance mechanisms to allow participants to provide input and feedback about their perceptions of justice around relative contributions and rewards (measurement items of ITJ).

7.2. Relationships between perceived inter-organizational justice and OCBs of project participants

In this study, we also found that project participants' perceptions of distributive and procedural justice, informational justice, and interpersonal justice have collectively accounted

for 32.2% (a weak R^2 value of 0.322) of the variances in their OCBs. However, the results in Table 3 show that only IPJ has a significant direct impact on OCBs, with β of 0.493 and a f^2 value of 0.117. Despite its small effect size, our findings further support Moorman (1991), Williams et al. (2002), and Rego and Cunha (2010), whose analyses of the relationship of organizational justice and OCBs show that employees' OCBs are significantly influenced by only their perceived interpersonal justice, but not their perceived informational, distributive, and procedural justice. It is possible, as suggested by Folger and Cropanzano (2001) and Scott et al. (2007), because interpersonal justice is more likely to bring up a moralistic response on people than other justice dimensions as the fairness of interpersonal treatment is closely associated with managers' sentiment and their norms towards setting acceptable social behaviors. These further add weights to the importance of selecting project managers who possess high level of emotional intelligence, apart from those traits discussed in Section 7.1. As suggested by Carmeli (2003) and Clarke (2010), emotionally intelligent managers are highly competent in developing interpersonal relationship with their co-workers, and in turn, inspiring them and gaining their behavioral commitment.

On the other end, the insignificant findings of DPJ on OCBs could offer a sense of optimism to people within the construction industry. In particular, distributive and procedural injustice is often being criticized as a detrimental problem in construction projects, characterized by a culture of opportunistic behavior and risk transfer which starts with clients offloading unmanageable risks to main contractors, and then to subcontractors and suppliers while refusing to pay appropriate risk premiums (e.g. Rahman and Kumaraswamy, 2001; Edwards and Bowen, 2005; Qu and Loosemore, 2013).

8. Conclusions

The aims of this paper were to explore the relationships between different dimensions of inter-organizational justice and their influence on project participants' OCBs. Using theories of equity, social exchange, and fairness, an online questionnaire survey was conducted of 135 professionals across the construction supply chain in Australia. The results indicate that project participants' perceptions of fair procedures and rewards are positively influenced by their perceptions of informational and interpersonal justice. Furthermore, their perceived informational justice is shaped by their perception of interpersonal justice. The results also show that project participants' judgment about fair procedures and rewards is more likely to skew towards how they had been involved and consulted about decision-making processes and outcomes (measurement items of informational justice) than how they had been treated with politeness, dignity, and respect (measurement items of interpersonal justice). However, when assessing the quality of information exchange, the project participants were highly sensitive to the interpersonal treatment of their counterparts. Collectively, the results imply that project participants are instinctively rational towards assessing if the procedures and rewards received are fair or not. As such, in building and maintaining good relationship with participants,

project managers should be respectful and communicate regularly to keep them updated of any decisions made and listen to their feedback.

Finally, our results reveal that organizational citizenship behaviors in construction projects can be viewed as a consequence of social relationship exchanges between participants. The findings indicate that when project participants believed that their socio-emotional needs were fulfilled and that they had been well taken care of, they might feel more obliged to return the goodwill by engaging in beneficial behaviors that promote the effective functioning of the overall project team. On the micro level of construction project management, the findings also point to the importance of project managers possessing not only good people skills but also high emotional intelligence and professionalism, and the ability to create a supportive and cohesive project environment.

It is acknowledged that these research findings need to be interpreted within the limitations of this exploratory study, especially since the majority of measurement items of the respective constructs were borrowed from cross-discipline studies and then re-contextualized into construction. It follows that the research findings and their implications are indicative and not conclusive. Also, the majority of the respondents were small and medium-sized construction firms in Australia, and the sample size ($N = 135$) of this study was relatively small. Perhaps, the latter limitation was the root cause of those small and negligible effect sizes detected in the hypothesized relationships. However, the sample size was more than 40, which is required for competent statistical analysis. Moreover, the use of the PLS-SEM approach reduced the potential problem associated with a small sample size. Furthermore, strong correlations might exist between the three constructs of inter-organizational justice and could induce bias into the findings. However, statistical analyses (such as AVE, MSV, ASV, VIF, HTMT, and cross loadings) have shown that all measurement items and their respective constructs are reliable and valid. Lastly, there needs to be more extensive research to explore the relationships between justice and OCBs and how these translate into better project performance. Future research may examine other variables such as emotion, leadership, and retaliation behaviors. Also, researchers may use other analytical techniques such as product indicator approach to test the interactive effect of variables or the hierarchical regression modeling to test the effect of some control variables (as such different roles and trades) on participants' justice perception and OCBs. Beside these, future qualitative research is needed to better understand how people perceive and define inter-organizational justice and the reasons why different types of justice influence each other. For example, how does interpersonal justice affect distributive, procedural, and informational justice and how do these then mediate OCBs. While this research has highlighted the nature of these relationships for the first time, there is a need for more in-depth understanding of "how" these relationships work. Also, different results might be observed in different countries where cultural perceptions of justice might differ. For example, in collectivist countries like Japan, the importance of interpersonal justice might be heightened in comparison to more individualistic

countries like the UK, USA, and Australia. These would be important questions for the international project management literature to address.

Conflict of interest

The authors declare that there is any conflict of interest in relation to the research article and its findings reported.

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