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The impact of interpersonal conflict on construction project performance: A moderated mediation study from China

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A moderated mediation study from China

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Abstract

Purpose – The purpose of this paper is to examine the relationship between interpersonal conflict and construction project performance. The authors test the proposition that this relationship is mediated by negative emotions and moderated by political skill.

Design/methodology/approach – This study used a structured questionnaire survey and gathered 266 completed data from 45 construction project teams in mainland China. To test the hypotheses, bootstrapping procedures were used.

Findings – The results show that interpersonal conflict and negative emotions all have inverse relationships with project performance. Additionally, negative emotions mediated the relationship between interpersonal conflict and project performance, and this indirect relationship will be mitigated when team members have a high level of political skill.

Research limitations/implications – These findings indicate that interpersonal conflict has a detrimental influence on project performance and should attract broad attention for future empirical literature. Furthermore, political skill is an effective contingent factor to suppress the detrimental influence of interpersonal conflict.

Practical implications – The findings imply that managers should highlight the importance of interpersonal conflict in construction projects.

Originality/value – This paper addresses a moderated mediation model to examine the relationship among interpersonal conflict, negative emotions and construction project performance, and it takes into account the moderating role of political skill. The paper also offers practical assistance to construction project managers in managing interpersonal conflict.

Keywords Project performance, Negative emotions, Political skill, Interpersonal conflict

Paper type Research paper

Introduction

The construction industry is developing rapidly and occupies a pivotal economic position in China. It is also clear that cost overruns, delays and decreased profit margins are prominent phenomena (Chan and Kumaraswamy, 1997; Meng, 2012). Numerous practices and studies have sought ways to reduce waste and improve construction project performance for project success (Chanmeka *et al.*, 2012; Chou *et al.*, 2010; Meng, 2012). Among these researches, conflict, especially interpersonal conflict, is argued to be an important influencing factor for project success (Brockman, 2014; Cheung and

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Chuah, 2000; Senaratne and Udawatta, 2013). Hahn (2000) pointed out that the frequency of interpersonal conflict at work ranges from 25 to 50 per cent in an employee's work day. Managers spend nearly 30-42 per cent of their time dealing with conflict between employees (Bobinski, 2006; Denny, 2005). Brockman (2014) stated that unresolved detrimental interpersonal conflict on the jobsite has yet to be fully realized.

However, interpersonal conflict in construction project teams is unavoidable. This is because construction project team is a project-based organization and involves a number of different parties, such as an owner, a contractor and a supplier (Senaratne and Udawatta, 2013). Every party has their own interest. When one party perceives that its interests are being opposed or negatively affected by another party, they will feel threatened and stressed. In addition, diverse ideas, values and beliefs among these parties facilitate poor interpersonal relationships. Interpersonal conflict on the job is identified as one of the top occupational job stressors (Narayanan *et al.*, 1999; Rainey, 1995) and is strongly linked to a reduction of project performance (Appelberg *et al.*, 1996). If conflict is not handled properly, it could escalate, and, furthermore, result in undesirable outcomes related to time delays, cost overruns and quality defects in the project (Leung *et al.*, 2005). Thus, construction projects exist within an adversarial environment in which interpersonal conflict is unavoidable.

Given the unavoidable characteristic and the detrimental influence of the interpersonal conflict, a large number of researches have tried to explore the underlying mechanism of interpersonal conflict on construction project performance. Brockman (2014) used qualitative research to explore the triggers and consequences of interpersonal conflict on a construction site. Brockman's (2014) study confirmed interpersonal conflict as an important factor affecting project cost (project performance). It also pointed out that when an interpersonal conflict occurred in teams, conflict parties were usually involved in negative emotions, including anger, frustration, stress and anxiety. Organization researchers indicated that negative emotions have dysfunctional effects on individuals' behavior, such as their effort and task performance (Kiefer, 2005; Seo *et al.*, 2004). People with negative emotions are more likely to narrow their attention to goal pursuits, which then leads to poor performance (Frijda, 1994). Obviously, team members' interpersonal conflict influences project performance through negative emotions. Cooke-Davies (2002) also indicated that individuals play a crucial role in project activities (i.e. communication, interaction and problem-solving) and project outcomes. People who are emotionally positive are more focused on team performance. Thus, the connection between emotions and project performance deserves more attention. In view of the relationship between interpersonal conflict and negative emotions and negative emotions and project performance, the present research attempts to go a step further by examining how interpersonal conflict influences project performance through negative emotions in construction projects.

Another research stream in the interpersonal conflict focuses on exploring how to buffer the dysfunctional effect of interpersonal conflict on project performance. Much of the literature used a contingency approach to examine the dysfunctional effect of interpersonal conflict (Huang, 2012; Lau and Cobb, 2010; Liu *et al.*, 2011; Tepper *et al.*, 2011; Cron *et al.*, 2005; Jiang *et al.*, 2013; Lin *et al.*, 2014). The contingency view of the effects of interpersonal conflict suggests that the direction and magnitude of effects will depend on the influence of contextual factors (Huang, 2012; Lin *et al.*, 2014; Martins *et al.*, 2013). For example, Huang (2012) explored the moderating effect of goal orientation on

the relationship between relationship conflict (interpersonal conflict) and team performance. The negative relationship between relationship conflict and team performance strengthens when team performance orientation is high. In Lau and Cobb's (2010) study, a conceptual model has been developed to explore how relationship conflict (interpersonal conflict) impacts performance through the effects of trust and exchange. This study examined how different forms of trust and exchange relate to the relationship between interpersonal conflict and performance. All these studies showed that the contingency approach prompted calls for the examination of potential moderating factors to explain some of the mixed findings. The contingency research analyzed how the moderating factors influence the original variables' relationships, which provide guidance to managers on adapting appropriate management strategies. Following this perspective, we intend to explore how an interpersonal comprehensive ability factor – political skill – moderated the effect of interpersonal conflict on the construction project performance. This research introduces political skill as the moderator factor, which is based on the idea that the construction project team is a diverse organization. Politics is inherent in organizations (Mintzberg, 1985). It is possible to develop political skill that will help practitioners understand how best to deal with interpersonal conflict and maximize project performance (Mintzberg, 1983).

Our study seeks to contribute to research and practice in several ways. The overall framework is presented in Figure 1:

- Based on the analysis of the relationship between interpersonal conflict and negative emotions and negative emotions and project performance, we further examine how interpersonal conflict influences project performance through negative emotions in a construction project.
- Based on the contingency approach, this paper will explore the moderating role of political skill on the indirect effect of interpersonal conflict and project performance (through negative emotions).

Interpersonal conflict, negative emotions and project performance

Interpersonal conflict refers to interpersonal clashes unrelated to task issues (Jehn, 1995; Barki and Hartwick, 2004). Researchers have generally viewed interpersonal conflict as a dynamic process that occurs between individuals who are in an interdependent and interactive relationship, and it is more likely to occur when individuals have diverse believes and values (Barki and Hartwick, 2004). Therefore, interpersonal conflict contains three important elements, that is, some form of interaction between individuals, interdependence among individuals and an incompatibility based on perception or values. Research shows that interpersonal conflict at work reflected as a broad range of interpersonal mistreatment behaviors, such as rude behavior and yelling. Furthermore, interpersonal conflict is one of the most prevalent and consequential stressors in the workplace, and it evokes various negative emotions and outcomes, including anger,

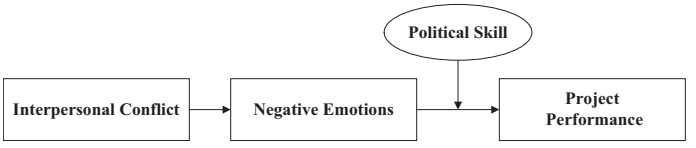

Figure 1. The proposed conceptual framework

anxiety, mistrust and deviant behaviors (Bruk-Lee and Spector, 2006; Schieman and Reid, 2008).

Moreover, according to social identity and self-categorization theories, individuals classify themselves and others into various social groups (Tajfel, 1981; Tajfel and Turner, 1985). In addition, individuals are motivated to maintain self and social identities, and they exhibit a favorable bias toward others who appear to have similar characteristics (Turner and Haslam, 2001). This is because they envision that their own values and beliefs will be reinforced. Interpersonal conflicts arise when there are incompatibilities based on different values, personalities and beliefs, which may prompt negative feedback such as hatred and disgust. As the magnitude of negative feedback increases, the feeling of intense negative emotional reactions increases. Jehn *et al.* (1997) also stated that the more different an individual, the more likely they are to present interpersonal incompatibility, leading to negative emotions. Thus, the following hypothesis is established:

H1. Interpersonal conflict will be positively associated with negative emotions.

Much empirical and theoretical research has also examined the relationship between negative emotions and performance (Seo *et al.*, 2010; Raftery and Bizer, 2009). Negative emotion is defined as a powerful psychological force that can lead to negative behavior and performance in important ways and can influence goal-directed behavior (Brown *et al.*, 1997; Mulki *et al.*, 2015). Seo *et al.* (2010) argued that a person's negative emotions are reflected in negative motivational behaviors such as a defensive attitude and decreased effort in their work in spite of possible opportunities to achieve a better performance. Raftery and Bizer (2009) examined the dysfunctional effect of negative emotions on performance. They stated that for participants who habitually use suppression, negative emotions may produce poorer performance on a subsequent task. An information processing perspective indicated that interpersonal conflict caused negative emotions, which interferes with individuals' information processing capacity, and therefore impedes performance (De Dreu and Weingart, 2003; Martins *et al.*, 2013). Thus, the following hypothesis is established:

H2. Negative emotions will be negatively associated with project performance.

Some researchers explored the underlying mechanisms to understand why interpersonal conflict affects performance (Pelled, 1996; Roseman *et al.*, 1994; Simons and Peterson, 2000). These researchers suggested that interpersonal conflict produces negative emotions, such as tension and antagonism, which distract team members from the work in hand. Jiang *et al.* (2013) conducted a multi-level analysis to explore the underlying mechanisms of interpersonal conflict. This study suggested that interpersonal conflict generates negative emotions, which influence conflicting parties' normal cognitive ability, and then distracts individuals from work performance. This study also showed that individuals with a high level of emotion regulation abilities are more likely to reduce the disruptive effects of interpersonal conflict.

In construction projects, interpersonal conflict has been identified as a determinant factor for project performance (Senaratne and Udawatta, 2013). It appears that time, cost and quality are the most well-known measures of project performance. Unresolved interpersonal conflict leads to cost overruns, delays and a decrease in the productivity of the construction projects (Kassab *et al.*, 2006). It is generally acknowledged that any

participant (e.g. owner, contractor and supplier) may be involved in interpersonal conflict due to the interdependent and interactive features of the construction projects. In Brockman's (2014) study, 74 construction personnel (superintendents, project managers, supervisors, foremen, journeymen or fifth-year apprentices) who routinely performed their work directly on a construction jobsite were individually interviewed. The interviewees were required to elicit one or more conflict incident and list the corresponding conflict results. After analyzing these conflict incidents described by the participants, Brockman found that most of the conflict parties were involved in negative emotions after interpersonal conflict. A sample quote is presented as follows:

> […] he was in a bad mood that day and I was messing with him, picking on him cuz I knew he was in a bad mood. And next thing I know, he's screaming I'm gonna come down and knock your teeth out of your mouth. (Brockman, 2014)

Followed by quote(s) from all interviewees, many words linked to negative emotions were described by the interview participants, such as anger, frustration, stress and anxiety. In Brockman's (2014) study, the consequences of each conflict incident were also described by interview participants. For example, in a conflict incident between an apprentice and a journeyman, a 15-min argument possibly costs thousands of dollars. Obviously, interpersonal conflict influences construction project performance, and negative emotion is an important mediating factor. Thus, the following hypothesis is established:

H3. Negative emotions will mediate the relationship between interpersonal conflict and project performance.

The moderating role of political skill

The construction project environment is described as an inherently political arena, where competing interest parties, limited resources, coalition building and interdependent relationships exist. In line with this view, recent research suggested that political skill is a critical personal skill for team members. Ferris *et al.* (2005) defined political skill as "the ability to effectively understand others at work and to use such knowledge to influence others to act in ways that enhance one's personal and/or organizational objectives". Political skill is a multidimensional construct, including social astuteness, individual influence, networking ability and apparent sincerity (Ferris *et al.*, 2005). Social astuteness and the individual influence abilities of the person refer to him/her as having a keen understanding of the workplace. Individuals with these skills are able to read people and situations well and act appropriately to elicit the desired response from others (Ferris *et al.*, 2005). Networking ability represents an individual's ability to build coalitions, utilize alliances and deal with a complex network relationship (Ferris *et al.*, 2005). Apparently, sincere people possess high levels of genuineness and integrity, which help them to gain the trust and confidence of those with whom they interact (Bing *et al.*, 2011; Ferris *et al.*, 2005). In addition, political skill referenced three important personality traits in related constructs: self-monitoring, political savvy and emotional intelligence. Thus, political skill overlaps with these three personality traits to some degree and is regarded as one of the most critical competencies for individuals in the modern complex organization environment (Ferris *et al.*, 2002; Mintzberg, 1983). Researchers have found political skill to be an important predictor of performance, self-efficacy, job satisfaction, organization commitment, career success and personal

reputation (Blickle *et al.*, 2012; Chopin *et al.*, 2012; Laird *et al.*, 2013; Meisler, 2014; Munyon *et al.*, 2014). Additionally, political skill has also been proven to moderate the overload-strain relationship (Perrewé *et al.*, 2005), stress-outcome relationship (Meurs *et al.*, 2010) and role conflict-psychological anxiety relationship (Perrewé *et al.*, 2004). As seen in previous studies (Chopin *et al.*, 2012; Munyon *et al.*, 2014; Perrewé *et al.*, 2005; Meurs *et al.*, 2010), political skill is a comprehensive pattern of social competencies, with cognitive, affective and behavioral manifestations, which have both direct effects on outcomes, as well as moderating effects on predictor-outcome relationships (Ferris *et al.*, 2007).

This study will explore the moderator role of political skill on the relationship between negative emotions and project performance. Furthermore, political skill will moderate the indirect effect of interpersonal conflict on project performance (through negative emotions). Politically skilled individuals could buffer the dysfunctional effect of interpersonal conflict through mitigating the negative emotions (e.g. anxiety, stress and frustration) at work. Individuals with a high level of political skill have the ability of emotion-restraint and emotion-regulation (Meurs *et al.*, 2010). This ability does not refer to a complete denial of negative feelings, but rather to the control and management of their expression of emotions. When negative emotions become aroused, which are caused by interpersonal conflict, politically skilled individuals reduce the use of offensive words and behaviors toward others (Perrewé *et al.*, 2005), which could prevent the situation from deteriorating into a hostile situation (Meurs *et al.*, 2010). In addition, politically skilled individuals regard interpersonal conflicts as opportunities rather than threats. When encountering interpersonal conflict at work, individuals can discover what others feel and treat this as important information rather than see it as a personal attack. In this way, they are likely to develop effective resolutions to conflict and avoid meaningless human struggle. Thus, the following hypothesis is established:

H4a. The relationship between negative emotions and project performance is weaker for team members high in political skill than those low in political skill.

H4b. Political skill will moderate the indirect effect of interpersonal conflict and project performance (through negative emotions). Specifically, the indirect effect is weaker for team members high in political skill than those low in political skill.

Interpersonal conflict study in China

The research upon which the hypotheses have been built is largely based on the settings of Western culture, but we intend to collect the data for this study in China. China, as home to Confucian ethics, is a typical collectivist society, emphasizing on team orientation and interpersonal harmony (Hofstede, 1980; Qian *et al.*, 2013). These values, beliefs and orientations have a significant bearing upon Chinese perceptions of conflict (Kirkbride *et al.*, 1991). First, the harmony and collectivism culture value urges individuals to control their emotions to avoid confusion and conflict and to seek harmony (Leung *et al.*, 2011). Second, the virtue of obedience is the cultural root of power distance. Third, the Chinese are careful of their face in conflict situations; "face-giving" and "face-saving" behavior is perceived as receiving pride and maintaining a sense of harmony (Leung and Ricky Yee-Kwong, 2003). Fourth, "guanxi" has received a certain amount of attention from China. "Guanxi" or the relationship with other parties, who are

in the social net, will be more likely to seek mutual satisfaction and accommodations (Wong and Tjosvold, 2010).

The operation of harmony, obedience, face and "guanxi" are somewhat more complex. Many researchers have explored Chinese conflict preference or conflict management styles based on the culture and psychology of the Chinese (Kirkbride *et al.*, 1991; Leung *et al.*, 2011; Wong and Tjosvold, 2010). These research results state that the Chinese tend to engage in no-assertive avoidance or compromise orientation when interpersonal conflict occurs. However, despite the expectations of avoidance or compromise in China, interpersonal conflicts are inevitable, as long as interaction exists in teams. The motivation for harmony, obedience, face and "guanxi" leads the Chinese to implement the strategies of emotion regulation and to strengthen their relationships. Additionally, political skill is an important catalyst. Therefore, the Chinese sample will be able to provide a suitable setting to examine the study's theoretical framework.

Methodology

Sample and procedures

The sampling frame for the survey was based on China's contractor firms, which are among the Engineering News Record's top 250 international contractors. To begin with, potential firms were contacted by mail sent directly to the senior manager. We explained the objectives, respondents' benefits and procedures of the study. Subsequently, six contractor firms contacted us and expressed their wish to participate in this investigation. After further communication, we verified 45 construction project teams for our study from these six contractor firms. Each of the six contractor firms was approached by one of the research assistants who assisted the author during data collection. A questionnaire survey is an effective instrument to measure research variables, and the information it gathers can be used to reveal intercorrelations among variables (Spector, 1994). Hence, a survey questionnaire for data collection was adopted in this study. The questionnaire items were first prepared in English and then translated into Chinese using Brislin's (1980) back-translation procedure. Each item was translated into Chinese and then back-translated twice by translators working independently. Any conflicts were discussed by the researchers and translators until agreement was reached. Furthermore, to ensure that the research endeavors actually met with our intention, a pilot test was administered to five construction professionals to clarify and refine the questionnaire. They commented on the questionnaire readability, comprehensiveness and precision. By incorporating their comments, a final questionnaire was created.

Subsequently, a large number of copies of the questionnaire were distributed among 45 construction project teams. The participants also met the following two criteria:

(1) currently performed their work directly on a construction project; and

(2) with more than five years of project experience.

The participants received the survey package in a meeting room during morning meeting hours. The package included an explanatory letter, a questionnaire and a written statement. The explanatory letter set out the purpose and significance of the research. In addition, the concepts of interpersonal conflict, negative emotions, project performance and political skill were carefully explained. A written statement assured subjects of the voluntary nature of the survey and of the confidentiality of personal

information. When the survey was finished, a total of 276 questionnaires were confirmed, of which, ten were removed due to incomplete data. As a result, 266 responses (a 51.2 per cent response rate) were used for subsequent analyses. The average project duration was three years. The average project team size was 30, and ranged from 20 to 50. An analysis of the demographic information of the respondents revealed that an overwhelming majority (90 per cent) of the respondents was male and the average age of the respondents was 35 years. Of the 266 participants, 22 per cent had 6-10 years of construction project experience, 31 per cent had 11-15 years of construction project experience, 29 per cent had 16-20 years of construction project experience and 18 per cent had more than 21 years construction project experience.

To test for non-response bias, potential differences between the respondents and non-respondents were investigated with respect to size in terms of the project team, duration of the project team and the number of team members. The results of the *t*-test ($p > 0.05$) present no significant differences, which indicate that non-response is not a problem with respect to the abovementioned aspects. Furthermore, the existence of possible common method bias was tested in two steps (Podsakoff *et al.*, 2003). First, all the construct measures were entered into a single-factor analysis, and there was no single factor that could account for the majority of the covariance in the measures. Second, Lindell and Whitney's (2001) marker variable technique was used. The survey included a question that was not related to the topic (degree of satisfaction with the infrastructure), and this question was correlated with the derived constructs. The results showed no significant correlation between the answers to this question and the important constructs and questions. These two tests indicated no evidence of common method bias.

Measures

Taking into account the fact that the data from this study were collected from multiple individuals, and to continue our study, the individual surveys should be aggregated at the team level (Klein and Kozlowski, 2000). To accomplish this, we used James *et al.*'s (1984) within-group interrater agreement index (R_{wg}) to justify aggregating individual members' responses to the team level. Median R_{wg} values higher than 0.70 are generally considered sufficient evidence of agreement to support aggregation (Chan, 1998). We also calculated the scale intraclass correlations (ICC)(1) and ICC(2). The ICC(1) reflects the extent to which variation in individual-level ratings can be attributed to between-team differences (Bliese, 2000). The ICC(2) reflects the stability of the team-level means (Bliese, 2000). In addition, to reduce the impact of multicollinearity, we mean-centered the variables (Aiken and West, 1991).

Interpersonal conflict. Drawing from a prior research on conflict study (Jehn, 1995), we measured the interpersonal conflict using a four-item scale. For example, respondents indicated whether conflict between members is characterized by a relationship-related issue. An example item is "To what extent are personalities clashes present in your work team?" Responses were given on a five-point Likert scale from 1 "Strongly Disagree" to 5 "Strongly Agree". Cronbach's alpha was 0.88. The results of median R_{wg} values higher than 0.70 are generally considered sufficient evidence of agreement to support aggregation (Chan, 1998). The ICC(1) for interpersonal conflict was 0.38, suggesting that this truly was a team-level phenomenon. The ICC(2) was 0.73, indicating stable team-level means for this construct. The ICCs suggested acceptable

reliability. A team-level score for interpersonal conflict was computed by averaging within-team responses to the scale.

Negative emotions. We measured respondents' negative emotions using five items. The items were based on studies conducted by Van Katwyk *et al.* (2000), Lazarus (1991) and Parkinson (1995). The respondents were asked to indicate the experienced frequency of each emotion at work. The items used in this study reflect some negative emotions, such as anger, anxiety, disgust, fear and fury. The responses were given on a five-point Likert scale from 1 "Strongly Disagree" to 5 "Strongly Agree". Cronbach's alpha was 0.91.

Project performance. Three criteria of project performance were used: cost, time and quality. These three criteria were mainly used to measure the overall performance of the construction project. The items were based on studies conducted by Kissi *et al.* (2013), Reich *et al.* (2014) and Yang *et al.* (2014). Moreover, project performance was measured using an eight-item scale. The respondents indicated to what extent they perceive that their projects have achieved or will achieve the following out comes (1 = not at all, 2 = just a little, 3 = moderate amount, 4 = quite a lot and 5 = a great deal). Cronbach's alpha was 0.85.

Political skill. We used Vigoda-Gadot and Meisler's (2010) shortened eight-item version of the self-reported Political Skill Inventory (PSI) (Ferris *et al.*, 2005). The shortened PSI consists of four dimensions: two items assessed social astuteness (e.g. "I have good intuition or savvy about how to present myself to others."); two assessed interpersonal influence (e.g. "I always seem to instinctively know the right thing to say or do to influence others."); two assessed networking ability (e.g. "I spend a lot of time and effort at work networking with others."); and two assessed apparent sincerity (e.g. "When communicating with others, I try to be genuine in what I say and do."). The respondents were asked to self-report their perceptions of their own political skill. A five-point Likert scale was used, ranging from 1 "Completely Disagree" to 5 "Completely Agree". Cronbach's alpha was 0.91. The results of median R_{wg} values were higher than 0.70. The ICC(1) and ICC(2) for the scale were 0.30 and 0.69, respectively. Team members' responses were averaged to create team-level scores for team political skill.

Control variables. Tenure and gender were controlled in this study. The respondents' tenures are commonly controlled for conflict studies (Amason and Sapienza, 1997; Jehn, 1995; Mooney *et al.*, 2007) and are treated as continuous variables. Moreover, gender was coded as 0 for female and 1 for male.

Reliability and validity

Confirmatory factor analyses (CFAs) were conducted to test the reliability and validity of the scales. We followed Fornell and Larcker's (1981) method to calculate the composite reliability of the scales. All the composite reliability values exceeded the cut-off point of 0.7 (Bagozzi *et al.*, 1991). In addition, we tested the average variance extracted (AVE) values (ranges from 0.56 to 0.63) for each scale, most of which satisfied the acceptable level (Bagozzi *et al.*, 1991). Furthermore, the square roots of the AVE for each scale were greater than any of the inter-correlations between the variables (listed in Table I). Hence, the test of discriminant validity is acceptable. We examined a four-factor CFA model that included interpersonal conflict, negative emotions, project performance and political skill. The proposed four-factor model fitted the data, χ^2/df (chi-square normalized by degrees of freedom) = 1.87, comparative fit index = 0.90,

non-normed fit index = 0.95 and root mean square error of approximation = 0.049. In addition, the Appendix presents the factor loadings for all items. All the factor loadings exceeded the recommended level of 0.7 (Fornell and Larcker, 1981), providing evidence for convergent validity. In the Appendix, composite reliability and average variance extracted values for each of the scales has also been presented.

Results and analysis

Table I shows the descriptive statistics and correlation coefficient matrix of the variables in this study. As noted in Table I, interpersonal conflict and negative emotions were positively related ($r = 0.32$, $p < 0.01$), whereas interpersonal conflict and negative emotions were all inversely related to project performance ($r = -0.29$, $p < 0.05$ and $r = -0.16$, $p < 0.01$, respectively). All these relations were consistent with prior research (Breugst *et al.*, 2012; Jiang *et al.*, 2013; Liu *et al.*, 2011; Örtqvist and Wincent, 2006; Seo *et al.*, 2010; Tepper *et al.*, 2011). In addition, none of the control variables were significant with the main effect variables. Political skill, as a moderator variable, also did not have a significant relationship with any of the other variables.

To test our study hypotheses, we used the bootstrapping procedure. This method is superior to Baron and Kenny's (1986) method (MacKinnon *et al.*, 2004; Preacher and Hayes, 2004; Shrout and Bolger, 2002). Scholars have identified potential shortcomings with this traditional approach to test mediation effects (Cole *et al.*, 2008; Preacher and Hayes, 2004; Shrout and Bolger, 2002). The bootstrapping procedure involves repeated random sampling observations with the replacement from the data and calculates the statistic of interest in each resample. Over many bootstrap resample, an empirical approximation of the sampling distribution of the statistic can be generated and used for hypothesis testing (Chen and Ayoko, 2012; Cole *et al.*, 2008). We used Preacher and Hayes's (2004) bootstrapping SPSS macros to test the mediation and moderation effects of the connection between interpersonal conflict, negative emotions and project performance and political skill.

Tests of mediation

Table II presents the results for *H1-3*. *H1* states that interpersonal conflict was positively associated with negative emotions, as indicated by a significant standard regression coefficient ($B = 0.49$, $t = 2.38$ and $p < 0.01$). Thus, *H1* was supported. Furthermore, the inverse relationship between negative emotions and project performance (*H2*), controlling for interpersonal conflict, was supported ($B = -0.44$, $t = -3.11$, $p < 0.05$). Finally, in support of *H3*, interpersonal conflict was found to have an

Variable	M	SD	1	2	3	4	5	6
Tenure	17.81	13.11	–					
Gender	–	–	0.01	–				
Interpersonal conflict	2.27	0.45	0.12	0.09	–			
Negative emotions	2.85	0.38	0.08	0.03	0.32**	–		
Project performance	2.86	0.62	0.02	0.01	−0.29*	−0.16**	–	
Political skill	3.57	0.46	0.17*	0.05	−0.12	−0.06	0.01	–

Notes: *$p < 0.05$; **$p < 0.01$

Table I.
Descriptive statistics and correlation coefficient matrix

Direct and total effects				
Variable	B	SE	*t*	*p*
Project performance regressed on interpersonal conflict	0.15	0.11	0.46	0.499
Negative emotions regressed on interpersonal conflict	0.49	0.13	2.38	0.003
Project performance regressed on negative emotions, controlling for interpersonal conflict	−0.44	0.12	−3.11	0.026
Project performance regressed on interpersonal conflict, controlling for negative emotions	0.33	0.17	2.21	0.021

Indirect effect and significance using distribution						
	Value	SE	LL 95% CI	UL 95% CI	*z*	*p*
Soble	−0.41	0.13	−0.65	−0.07	−3.12	0.040

Bootstrap results for indirect effect				
	M	SE	LL 99% CI	UL 99% CI
Effect	−0.38	0.16	−0.79	−0.02

Notes: Sample size = 45; number of bootstrap resample = 3,000; LL = lower limit; UL = upper limit; CI = confidence interval

Table II.
Regression results for mediation

indirect effect on project performance; this indirect effect was negative (−0.41). The formal two-tailed significance test demonstrated that the indirect effect was significant (Sobel $z = -3.12$, $p < 0.05$). Bootstrap results confirmed the Sobel test (Table II), with a bootstrapped 99 per cent confidence interval (CI) around the indirect effect not containing zero (−0.79, −0.02). Thus, *H1-3* received support.

Tests of moderated mediation

Table III presents the results for *H4a* and *H4b*. *H4a* stated that the relationship between negative emotions and project performance will weaken for team members high in political skill than for team members low in political skill. The results indicated that the interaction term between negative emotions and political skill on project performance was significant ($B = -0.22$, $t = -2.34$, $p < 0.01$). To fully support *H4a*, we applied conventional procedures for plotting simple slopes (Figure 2) at one standard deviation above and below the mean of the political skill measure. As shown in Figure 2, the inverse relationship between negative emotions and project performance will weaken under conditions of higher political skill. This result provides support for *H4a*.

In support of *H4b*, we examined the conditional indirect effect of interpersonal conflict on project performance (through negative emotions) by conducting Preacher *et al.*'s (2007) statistical test. As shown in Table III, the conditional indirect effects of project performance were significant under all three conditions: low ($p < 0.05$), mean ($p < 0.01$) and high ($p < 0.01$). In conclusion, this significant indirect effect means that political skill decreases the mediation effect of negative emotions between interpersonal conflict and project performance, which is consistent with the *H4b*.

Predictor	B	SE	*t*	*p*
Negative emotions				
Constant	0.04	0.08	0.47	0.735
Interpersonal conflict	0.39	0.20	2.98	0.007
Project performance				
Constant	−0.01	0.05	−0.12	0.676
Interpersonal conflict	−0.33	0.11	−2.85	0.013
Negative emotions	−0.40	0.16	−3.29	0.021
Political skill	0.03	0.15	0.17	0.799
Negative emotions × Political skill	−0.22	0.23	−2.34	0.006

Moderator	Level	Boot indirect effect	Boot SE	Boot *z*	Boot *p*
Political skill	Low	0.13	0.13	0.87	0.035
	Mean	0.26	0.16	2.14	0.009
	High	0.34	0.14	3.05	0.001

Notes: Sample size: 45; number of bootstrap resample = 3,000

Table III.
Regression results for conditional indirect effect

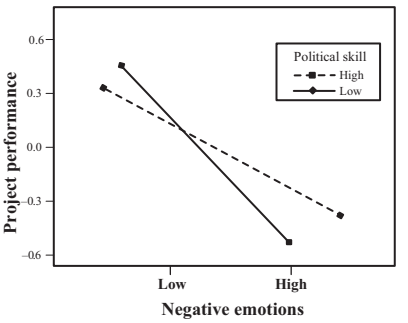

Figure 2.
Project performance predicted by negative emotions moderated by political skill

Possibility of alternative models

Based on the study's cross-sectional nature, it is possible that alternative model paths exist. Teams may perceive their poor project performance as an aversive characteristic, which can lead to an increase in negative emotions, and, in turn, the teams' negative emotions might increase members' interpersonal conflict. Therefore, to investigate this issue, we also estimated the indirect effects model and the conditional indirect effects model with project performance as the antecedent variable and interpersonal conflict as the outcome variable. The results showed that the indirect effect from project performance to interpersonal conflict (through negative emotion) was different from zero (−0.21; 99 per cent bootstrap CI = −0.17 to −0.04). This finding indicates the possibility of a feedback loop. In other words, the teams' interpersonal conflict influences project performance through negative emotions, but, in turn, poor project performance might also increase the teams' negative emotions and interpersonal conflict. However, the present data cannot provide further support for the moderate effect of political skill on the relationship among project performance, negative emotions

and interpersonal conflict. Accordingly, the recursive model cannot be completely explained, and this study provides a complete evidence for the suggested hypothesis.

Discussion and conclusion

This study examined the influence of interpersonal conflict within a construction project team context. Initially, we predicted negative emotions to operate as a mediating mechanism between interpersonal conflict and project performance. We then determined political skill as a contingency factor that can mitigate the indirect relationship between interpersonal conflict and project performance. The study results supported the hypothesis relationship, demonstrating that the magnitude of the indirect relationship was contingent upon the levels of political skill.

Our findings provide several theoretical and empirical contributions in several ways. On the one hand, previous quantitative research has devoted little attention to the interpersonal conflict of construction projects, especially the relationship between interpersonal conflict and construction project performance. In spite of the fact that China's traditional culture tends to avoid conflict, this study has indicated that interpersonal conflict is still a problem in construction projects. Our study used a quantitative research method to explore how interpersonal conflict influence project performance through negative emotions. On the basis of the current results, construction project teams whose members tend to suppress a display of negative emotions seem to be in a better position to curb the detrimental performance. On the other hand, this finding is important because it suggests that in spite of the detrimental effect of interpersonal conflict and negative emotions on project performance, these negative influences are mitigated when team members have a high level of political skill. Political skill is an important interpersonal ability in current organizations (Ferris *et al.*, 2002). Thus, this study proved that human factor plays an important role in conflict resolution. It also responded to Ferris's *et al.* (2002) appeal to search for boundary conditions or the moderating effects of political skill in all types of organizational environments.

Our findings also have practical implications for the managers in construction project teams, especially in China. China's construction industry is developing rapidly, particularly in terms of huge investments and long construction periods. Construction project performance is one of the most important indicators for project success. This study highlights the importance of interpersonal conflict in construction project teams, which is unavoidable and strongly linked to a reduction in project performance. Furthermore, we found that political skill as a comprehensive human factor buffered the negative outcome of interpersonal conflict. From the perspective of conflict management, absorbing and training team members with a high level of political skill in construction projects is an effective conflict management strategy. For one thing, managers should be absorbing politically skilled individuals at the project team construction stage. Indeed, political skill has trait-like qualities and has been described as a "personality construct" (Meurs *et al.*, 2010). Therefore, managers may be able to use the political skill measure scale as a selection standard to identify those applicants who have high "political skill". This selection process could assess candidates on their political skill, particularly when the jobs they are seeking require team influence tactics. Another point is that project managers need to give time, effort and resources to create and use political skill training programs. Ferris *et al.* (2007) explained that political skill

possesses dispositional antecedents, but it can also be shaped and developed through socialization and training. Ferris *et al.* (2005) discussed a number of different methods for training team members to improve political skills, such as lecture-based training, drama-based training, mentoring, behavioral modeling, video-taped role-playing with feedback and critique sessions. Given the amount of time and cost of the training program, Meurs *et al.* (2010) suggested that selecting more politically skilled team members might be more feasible than training for teams. In short, when a project team possesses a great number of politically skilled team members, teams will experience a number of positive outcomes (Ferris *et al.*, 2005).

Limitations and further research

Like most research, this study has limitations. First, the data were largely cross-sectional, drawn from a relatively small sample. In future, researchers should examine similar constructs with longitudinal data in a large construction project team sample. Second, the sample was confined to the construction industry in China; hence, generalizations to other industries and other national culture are also needed in further research. However, interpersonal conflict is common, as long as interaction and interdependence exist between team members. Thus, this study has provided some guidelines for future research about interpersonal conflict. Third, political skill was only measured through self-reported assessments. Although this procedure might be acceptable as an initial test in this research, future efforts should include other assessment methods, such as peer–peer reports and supervisor reports, to ensure the construct is being captured in a valid manner. Fourth, the level of project performance was qualitatively evaluated by participants, which was accepted and has been used pervasively in previous research (Kissi *et al.*, 2013; Ngacho and Das, 2014; Yang *et al.*, 2014). In fact, project performance evaluation is a complex process, which includes various indicators (e.g. cost, schedule and quality). Further research might consider developing more elaborate measures to enable a richer convergence of construction project performance.

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Appendix

Table AI. Confirmatory factor analysis of measure

Construct	Factor loading	AVE	CR
Interpersonal conflict		0.62	0.87
How much friction is present in your work team?	0.77		
To what extent are personalities clashes present in your work team?	0.85		
How much strain interpersonal relationship is present in your work team?	0.71		
How much mood conflict is there in your work team?	0.82		
Negative emotions (The extent to which you experienced each emotions at work)		0.56	0.86
Anger	0.71		
Anxiety	0.74		
Disgust	0.81		
Fear	0.73		
Fury	0.77		
Project performance		0.63	0.93
Finish project within the budget	0.79		
Finish project on time	0.77		
Meeting quality specification	0.75		
Fulfilling owner's satisfaction	0.80		
Level of user's satisfaction	0.81		
Meeting other stakeholders' satisfaction	0.89		
Meeting project's safety goals	0.76		
Meeting project's risk goals	0.81		
Political skill		0.60	0.92
I spend a lot of time and effort at work networking with others	0.82		
At work, I know a lot of important people and I am well connected	0.70		
It is important that people believe I am sincere in what I say and do	0.70		
When communicating with others, I try to be genuine in what I say and do	0.71		
I always seem to instinctively know the right thing to say or do to influence others	0.77		
I have good intuition or savvy about how to present myself to others	0.74		
It is easy for me to develop good rapport with most people	0.85		
I am able to make most people feel comfortable and at ease around me	0.88		

Notes: AVE = average variance extracted; CR = composite reliability

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