A Final Manuscript submitted to

The Journal of Construction Engineering and Management, ASCE

(Specialty Areas: Contracting)

"Contingent Use of Negotiators' Tactics in Construction Dispute Negotiation"

(The audience of the paper shall include both researchers and practitioners.)

Manuscript #: CO-023870R2

by

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January 2009

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Abstract

In the course of negotiation, negotiators' tactics should be responsive to the situational factors. This is commonly described as the contingent use of negotiators' tactics. This study examines this concept in construction dispute negotiation (CDN) and has three stages of work. Stage 1 develops taxonomies of the three construction dispute negotiation dimensions: dispute sources, negotiators' tactics and negotiation outcomes by exploratory factor analysis (EFA). A structural equation modeling (SEM) is also used to confirm the taxonomies. Stage 2 examines the contingent use of negotiators' tactics on outcomes respective to the dispute sources through the use of moderated multiple regression (MMR). Stage 3 discusses the findings. The dispute source, "*Delay"* is found to be a universal moderator in the MMR analysis of the tactic-outcome relationships. That means when the dispute source is delay, a wide range of negotiators' tactics can be used respective to outcome intended. It is also found that the most versatile tactics are those that seek progress. This group of tactics is effective in almost every group of dispute source and in general positive results can be expected. However, aggressive and assertive tactics should be used restrictively as it will only be useful against a compromising negotiation counterpart.

Keywords: Conflict, Dispute Resolution, Negotiations, Contingency

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Introduction

In construction, negotiation is a common way to resolve inter-organizational disputes and claims. However, not all negotiations can reach a settlement despite their apparent efficiency in time and cost. The interactions between negotiators may not be rational because of emotional factors (De Dreu and Van Kleef 2004). The information exchange between contracting organizations is frequent and dynamic to the extent that a negotiator move is influenced by the action of his/her negotiating counterpart. It has been suggested that an ideal move is one that strives to achieve one's own goal as well as addressing those of his/her counterpart. This would involve the use of cognitive schemas that help an individual to simulate the negotiation process whereby strategies can be adjusted according to the situation (Tenbrunsel *et al*. 1996). This is a type of stimulus-response process coupled with the use of tactics to move the negotiation forward. Thus, the contingent use of tactics is decisive in achieving the desired outcomes (Cheung and Yiu 2005).

Contingent use of negotiators' tactics

The effects of negotiators' tactics respective to particular situations have been explored in by Walton and Mckersie (1993). It has been suggested that integrative tactics pave way for negotiation outcomes of "better compromises", "win-win solutions", "value creation" and “expanding the pie” (Barry and Friedman 1998; Walton and Mckersie 1993). Furthermore, experimentalists have also demonstrated that psychological biases (Bazerman 1994; Mnookin *et al*. 2000), personality (Barry and Friedman 1998), social motivations (De Dreu and Van Kleef 2004) and gender of negotiators affect their choice of tactic (Eagly and Crowley 1986). Male negotiators tend to use pressure or even forceful tactics in labour disputes (Eagly and Crowley 1986), tactics preferred by experienced negotiators are often procedural laden (Friedman *et al*. 2000) and aggressive tactics are probably the norm in Europe and the States (Volkema and Fleury 2002). Moreover, incompleteness of information, uncertainty of negotiation outcomes and number of negotiating issues can also be major considerations of negotiators in choosing tactics. Notwithstanding, some negotiators’ tactics were classified as non-contingent in nature (i.e. tactics that can be used in most situations). For example, reactive tactics such as recognizing the other’s underlying needs, encouraging exchange of information, establishing negotiation procedure and agenda, developing trust and brainstorming alternatives are considered as versatile (Ren *et al*. 2001). Among these, trust building tactics are fundamental in keeping negotiators at the negotiation table (Ren *et al*. 2001). Behavioral scientists, Lax and Sebenius (1986) noted that yielding tactics are positively associated with settlement under impasses. Contending tactics are often useful when negotiation is taking place at a high level of hostility, limits and accountability to constituents (Ben-Yoav and Pruitt 1984; Walton and Mckersie 1993).

This paper reports a study on the contingent use of negotiators' tactics in construction dispute negotiation (CDN) and has three stages of works. Stage 1 aims at enhancing the understanding of CDN. This stage involves the development of taxonomies for the three construction dispute negotiation dimensions: dispute sources, negotiators' tactics and negotiation outcomes. Thus, the operating objective of stage 1 is to identify basic dispute sources, generic types of negotiators' tactics and negotiation outcomes in CDN. With these, the contingent use of negotiators' tactics is then developed in stage 2 with the use of a statistical technique of moderated multiple regressions (MMR). Stage 3 provides a discussion on the findings.

Stage I: Development of taxonomies

Data collection

A literature review was conducted resulting in the identification of 30 construction dispute sources, 27 negotiators' tactics and 24 negotiation outcomes as summarized in Tables 1, 2 and 3 respectively. Measurements of the three construction dispute negotiation dimensions were collected by a questionnaire designed to gather case specific data from construction professionals. The questionnaire has four sections. The respondents were first asked to provide their background information and particulars of one of their most recently completed construction dispute negotiation with owner (or contractor). As such parties involved in these construction disputes are between owner and contractor for each set of data. The remaining three sections address the three negotiation dimensions. The perceptive assessments on the three dimensions were evaluated by 7-point Likert scale of significance. The targeted respondents were construction professionals such as architects, engineers, quantity surveyors and project managers with experience in construction dispute negotiation (CDN). They were randomly selected from the construction firms which are listed in the Hong Kong Builder Directory (Far East Trade 2003) and professional institutes such as the Hong Kong Contractor Association (HKCA), the Hong Kong Institute of Surveyors (HKIS) and the Hong Kong Institution of Engineers (HKIE).

Sampling

Prior to mailing the surveys, the following equation was used to determine the sample size:-

$$n = \frac{Z^2 p(1-p)}{C^2} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

The samples are needed to yield responses at 95% confidence level (Z-value = 1.96). p is the percentage of picking a choice (i.e. 0.3), C is the confidence interval (i.e. $\pm .10$). With these, the required sample size (*n*) can be calculated. This result showed that the number of sample size (*n*) shall not be smaller than 81.

When deciding the number of targeted respondents (*N*), response rate of previous studies of construction management were considered. For example, the response rates of Ng *et al*. (2005), Chan *et al*. (2001) and Fong and Lung (2007) are 32.3%, 44% and 59.7% respectively. Taking the average of these responses rates, 45% of response rate can be obtained. Hence, during the research design process of this paper, the estimated number of targeted respondents (*N*) was calculated by the following formula:-

N x 45% = 81 ………………………………………………………………………….…(2)

$N = 180$

In this study, n and N are 92 and 230 respectively. These figures were above the threshold requirement of 81 and 180 respectively.

Finally, a total of 230 targeted respondents were identified. The targeted respondents were first contacted. If they agreed to participate in the study, the data collection questionnaire was then sent either by post, fax or email as preferred by the prospective respondents. In this regard, a total of 103 questionnaires were returned. Eleven of them were incomplete, and were discarded from the data analyses. The 92 completed questionnaires gave a response rate of 40%. 83% of the returned questionnaires were completed by respondents having 5 years experience or more. Table 4 shows the composition of the respondents by their experience in construction negotiation. The project nature of the negotiation cases are building (53%), civil (15%) and building services (13%) and the remaining related to alteration and some landscaping work.

< Table 1 here >

<Table 2 here>

<Table 3 here>

<Table 4 here>

Taxonomy is a system by which categories are related to one another by means of class inclusion. Exploratory factor analysis (EFA) explores these structures of interrelationships among data to define a set of common underlying constructs, known as factors. It aims at (1) estimating factors or latent variables, and (2) reducing dimensionality of a large number of observed variables to a manageable number of latent factors. In this regard, separate dimensions of the structure can be identified. Thus, the data obtained for dispute sources, negotiators' tactics and negotiation outcomes were each subject to EFA for the development of their respective taxonomies. The suitability of the data was evaluated by examining the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. Table 5 shows the magnitudes of these measures. The three KMO measurements of sampling adequacy results indicated that the data sets are adequate as they all met the threshold value of 0.5. The low significance of the Bartlett test of sphericity also supports the adequacy of the data sets to perform EFA. To shortlist factors, only factors having an eigenvalue greater than 1 were considered significant according to the eigenvalue-greater-than-1 principle. The factor structures are simplified and obtained from VARIMAX rotation to reduce the ambiguities

(Hair *et al*. 1998). As a rule of thumb suggested by Hair *et al*. 1998, factor loadings greater than 0.60 is considered significant for a sample of 92 respondents. In this connection, variables with factor loadings less than 0.60 were discarded so as to achieve simpler structure with greater interpretability (Fava and Velicer 1992). The statistics of EFA of the three negotiation dimensions are summarized in Table 6.

<Table 5 here>

<Table 6 here>

Taxonomies of construction dispute sources

Eight factors were extracted for taxonomies of construction dispute sources. Seven dispute sources were extracted for factor 1 (Table 1). This factor addresses the most common dispute sources that relate to the performance of contract. As such, it is described as "*Non-performance of contract*". It is one of the factors that directly correlate to the potential dispute causes of construction projects (Molenaar *et al*. 2000). Factor 2 consists of three dispute sources. These dispute sources are collectively described as "*Disagreement*", which generally involves divergence over assessments of monetary claims. In construction, these types of claims often involve complex mandatory design changes (Kumaraswamy 1997; Sarker *et al*. 1998). Due to rigid time-frame of construction project, contractor may find it difficult to truly assess their cost implications upon receipt of every variation order made.

Latent disputes and programme disruptions may then arise (Kumaraswamy 1997; Sarker *et al*. 1998). Factor 3 is identified as "*Dictatorship*" and consists of three dispute sources. This factor addresses the contending behavior of contracting parties in the course of negotiation. In this situation, the dominating parties often exploit the right of the other parties (Jannadia *et al*. 2000). Factor 4 is composed of three dispute sources. This factor is named as "*Differences*". Ambiguous information flow has long been identified as a dispute source in construction industry (Cox and Thompson 1997). The lack of trustful relationship among contracting parties would be one of the main reasons. As such, they are not likely to perform their duties in good faith. Factor 5 consists of two dispute sources related to "*Incompetence of parties*". In construction, the confrontational attitudes of contracting parties are manifested by fault finding behavior once conflicts occur. This stifles creativity and formulation of solutions (Cheung *et al*. 2003). Factor 6 is described as "*Self-interest*", which is composed of a single dispute source. Contracting parties with high self-interest value often perceive the contract as a fixed-pie and they are only interested in value-claiming not the work of itself (Cheung *et al*. 2003). Factors 7 and 8 consist of single dispute source. These factors address: "*Delay*" and "*Variation*". In construction, multi-layered sub-contractor system is one of the root causes of programme disruption. Delay of a sub-contractor may affect the progress of other parties (Sarker *et al*. 1998). Another major source of dispute in the construction industry is variation

(Kumaraswamy 1997; Sarker *et al*. 1998), which often stifles productivity and creates disputes among contracting parties.

Taxonomies of negotiators' tactics

EFA was conducted on the negotiators' tactics to develop the taxonomies with seven factors (Table 2). Six tactics are extracted for factor 1. This factor is described as "*Procedure focused*", which collectively addresses the tactics of focusing on procedural matters. As suggested by Rahim (2001), this would provide a mutual consensus for the negotiating parties to control the process by acknowledging the other parties' proposal or view. On the other hand, factor 2 describes the tactics of focusing issues. This factor consists of three tactics. The functions of these "*Issue focused*" tactics are to assist disputants to break the inertia, build trust through the sharing of information and establishing common ground (Wong and Cheung 2005). Factor 3 is named as "*Aggression*". It is made up of two tactics. Aggressive tactic is commonly used in distributive negotiation (Volkema and Fleury 2002). The negotiating parties would attempt to gather important information from the counterpart and reiterate their own positions (Walton and Mckersie 1993). Factor 4 describes "*Assertion*" tactics that aim at collecting positional information to contend (or concede) and allow the growth of pressure (Walton and Mckersie 1993). "Hiding bottom line" is extracted for factor

5 which is named as "*Reserved*". This tactic is commonly used when hard positioning is encountered (Volkema and Fleury 2002). Moreover, when negotiation takes place with an imbalance of power, time and cost, pressure tactics are often adopted to protect the contracting parties from being unfairly or exploitatively treated (Jannadia *et al*. 2000). Factor 6 is described as "*Progress seeking*" which consists of two tactics. In the course of negotiation, these tactics are often used to press for settlement or to break deadlock (De Dreu and Van Kleef 2004). Factor 7 is composed of a single tactic. This factor describes the "*Options generating*" negotiators' tactics which help negotiating parties to identify options that satisfy both parties' goals (Walton and Mckersie 1993).

Taxonomies of negotiation outcomes

As indicated in Table 3, 24 negotiation outcomes were used in the data collection process. The EFA suggested a 4-factor arrangement. Factor 1 consists of nine negotiation outcomes. These outcomes are fairly self-explanatory, which can be collectively described as "*Deterioration*". Factor 2 consists of five outcomes. These outcomes describe the "*Substantial improvement*". This factor can be defined as achieving quality agreement, stimulating discussions, awakening creativity/innovation and fostering speedy settlement attained during negotiation. Factor 3 consists of two negotiation outcomes. These outcomes suggest the “*Maintaining of parties’ relationship*” in a way that future business can be anticipated (De Dreu and Van Kleef 2004). Factor 4 is described as “*Position clarification*”. It is defined as the negotiating parties attempt to clarify and re-structure their interest, goals and further negotiating opportunities.

Having developed the taxonomies of the three construction dispute negotiation dimensions as aforementioned, these taxonomies can then be confirmed by confirmatory factor analysis (CFA). Structural equation modeling (SEM) that has been commonly used in management studies (Wong and Cheung 2005) for this purpose was used. SEM is a tool to estimate a series of interrelated dependent relationships and confirm factor matrices simultaneously (Hair *et al*. 1998). To detect the statistical fitness of SEM models, six major types of goodness-of fit (GOF) indices are often used in the verification process. A summary of these GOF indices and their threshold values are shown in Table 7.

<Table 7 here>

Initial SEM models

Eight, seven and four factors were developed for the taxonomies of dispute sources, negotiators’ tactics and negotiation outcomes respectively. Based on these results, the schematic SEM initial models of each of these taxonomies are constructed. The arrows in the models represent the direction of the hypothesized influence (Molenaar *et al*. 2000). The interrelationships of all the latent and observed factors are to be considered in a holistic manner in SEM. As discussed, the overall fitness of the initial SEM models was assessed by the GOF indices. Table 8 reports the GOF indices of these initial SEM models. It is found that some of the GOF indices of the initial models are lower than the recommended acceptance criteria (Table 8). According to Arrindell *et al.* (1999), model fitness may be hampered by the existence of highly correlated item pairs. In this case, refinement of the model to improve model fitness is required (Wong and Cheung 2005). To achieve this, the modification indices from AMOS software are used to formulate the expected reduction in the overall model chi-square level for each possible path (Hair *et al*. 1998).

<Table 8 here>

The refined SEM models

In the final refined model, all of the GOF indices were within the acceptance criteria. All x^2/DF values are statistically significant. The goodness-of-fit index (GFI) values reach the acceptable level. The RMSEA values are generally above the suggested threshold. Hence, the results of CFA statistically confirm the factor solutions of the taxonomies of the three negotiation dimensions derived from EFA respectively. The three refined models are given in Figures 1, 2 and 3 respectively.

<Figure 1 here>

<Figure 2 here>

<Figure 3 here>

Stage II: contingent use of negotiators' tactics

Moderated multiple regression (MMR)

The contingent nature of negotiators' tactics can be demonstrated by the moderated causal relationship among dispute sources, negotiators' tactics and negotiation outcomes. This causal relationship can then be analyzed by the use of moderated multiple regression (MMR). This method has been successfully used in assessing the viability of contingency models and the mathematical treatment of formulation of the moderating term which can be found in the studies of Cohen *et al*. (2003). MMR is the extension of multiple regression in which a moderating variable is included in the regression equation. Generally, multiple regressions describe correlations between a dependent variable and a number of independent variables (Equation 3).

$$Y = a + b_1X + b_2Z + \varepsilon \qquad \text{(3)}$$

where Y is the dependent variable; X and Z are the independent variables; a, b_1 and b_2 are unknown constants; ε is the random error.

As shown in Equation (3), the multiple regression model demonstrates that X and Z have an independent effect on the prediction of Y. In contrast with the multiple regression, moderated multiple regression (MMR) suggests that the predictive power of X on Y is dependent upon Z, i.e. a moderating effect exists. In this regard, a moderator term, which is a compound variable formed by multiplying X by the moderator Z is included to the MMR model (Equation (4)).

$$Y = a + b_1X + b_2Z + b_3XZ + \varepsilon \quad \ldots\ldots (4)$$

where XZ is the moderator term of the MMR model.

Further details on the mathematical derivation of MMR can be found from the works of Cohen *et al*. (2003) and Jaccard *et al*. (1990). With this method, negotiators' tactics are set as predictors, negotiation outcomes as criteria, and dispute sources as moderator variables in the study. The MMR model involves examining whether the reported use of negotiators' tactic (T) interacts with the reported dispute source (D) in predicting the negotiation outcome (O). To perform MMR, the following two steps are suggested by Cohen *et al*. (2003) and Hair *et al*. (1998):

1. Formation of moderating variable

The aim of this step is to form the moderating variables. Based on the taxonomies of each negotiation dimensions, factor scales can be devised for the development of MMR models. Such scales are the composite measures created for each observation on each factor extracted in the EFA (Hair *et al*. 1998). In this connection, new sets of variables were developed for each of the three negotiation dimensions. In the light of the above, a hypothetical MMR model can be built:

$O_i = a_0 + b_1 T_j + b_2 D_k + b_3 T_j D_k + \varepsilon$ ……………………………………........………………… (5)

where O_i is the i^{th} negotiation outcome scale from the identified taxonomy, i = 1, 2, 3, 4, 5, 6, 7 or 8. T_j is the j^{th} negotiators' tactic scale from the identified taxonomy, j = equal 1, 2, 3, 4, 5, 6 or 7. D_k is the k^{th} dispute source scale from the identified taxonomy, k = 1, 2, 3 or 4. $T_j D_k$ is the moderating term.

2. Test of significance on moderating effect

There are two possible implications when the moderating effect is statistically significant. First, the change in the relationship between the negotiators' tactics and the negotiation outcomes depends on the dispute sources. Otherwise, the negotiators' tactics being used have 'constant' effect on the negotiation outcomes. To test the significance of moderating effect, another two steps were employed. Firstly, F-test can be used to detect the significance on the increase of the R^2 (i.e. ΔR^2) between the regression models with and without moderating term. The significance of the ΔR^2 values explains the presence of regression variate for meeting the regression assumptions and moderating effect of the moderator variable (Cohen *et al*. 2003).

Secondly, the *t*-test statistic is used to assess statistical significance of the moderating term T_jD_k in the MMR model. The *t*-test statistic can be performed to test whether the moderating term should be included in the predictive model or not. A *p*-value of less than 0.05 indicates that the inclusion of the moderating term is regarded as significant in the MMR model.

Stage III: Findings and Discussions

In this study, a total of 224 MMR models (devised from the combination of eight dispute source scales, seven negotiators' tactic scales, and four negotiation outcome scales) were constructed. By performing the procedures as aforementioned in Stage II, 28 of the MMR models were found significant. To facilitate interpretation, these MMR models are summarized in Table 9. As an illustration, the negotiators' tactic of "*Procedure focused*" is perceived to be contingently effective to deal with dispute related to "*Self-interest*" as far as the outcome of attaining "*Substantial improvement*" is concerned. The tactic "*Issues focused*" is perceived to be contingently effective with regard to the dispute source of "*Dictatorship*" with respect to the outcome of "*Positional clarification*". By using this approach, the overall findings of this study can be elaborated. Generally, the extent of contingent effectiveness of negotiators' tactics in achieving their respective outcomes was identified.

<Table 9 here>

The most versatile negotiators' tactics: "Progress seeking"

Versatile is defined as being effective in a wide range of situations. As shown in Table 9, some tactics are more versatile than the others and the most versatile negotiation tactics are found to be *"Progress seeking"* and *"Issues focused"*. This is supported by the number of dispute sources displaying moderating effects. With their moderating effects, *"Progress seeking"* tactics are statistically identified as one of the generic types of negotiators' tactics. With these tactics, negotiators are able to lower the expectation of the other parties. This can be done by highlighting the importance of detaching the other parties' interests from the issue itself and negotiating in terms of positions and compromise (Walton and McKersie 1993). Furthermore, the *"Progress seeking"* tactics are expected to be conducive to the reconciliation process as they drive the involving parties to move forward and become more ready to make concession when necessary. Similarly, the use of *"Issues focused"* negotiators' tactics often tends to produce favorable negotiation outcome such as "*Position clarification*". This finding is supported by the previous studies of Friedman *et al*. (2000). These tactics can foster efficient sharing of information, permit rapid exploitation of unexpected opportunities and construct trusting environment (Wong and Cheung 2005). Negotiating parties will hence remain at the negotiation table with conscientious efforts to make sense of the available information. In this situation, they would demonstrate a willingness to trust and move towards exploring ways to achieve pareto-optimal negotiation outcomes, i.e. one party is made better off without making any other party worse off.

A universal moderator: "Delay"

"*Delay*" is one of the major dispute sources in construction. In this study, it is also found to have moderating effect in most of the relationships between negotiators' tactics and negotiation outcomes. As shown in Table 10, where a dispute is related to delay, a range of tactics can be used to achieve the four generic Negotiation outcomes. With this moderator, the use of different negotiators' tactics would likely achieve the negotiation outcome of "*Substantial improvement*" – e.g. reaching a greater level of agreement, stimulating discussions, creating innovative ideas and saving time. Aggressive and assertive types of tactics can be useful with a compromising negotiation counterpart as concession can be obtained.

The most responsive negotiation outcomes: "Substantial improvement" and "Position clarification"

"Substantial improvement" and "*Position clarification*" appear to be the most responsive outcomes to the tactics. These results suggested that construction negotiation can be an

effective way to resolve disputes. As shown in Table 10, "*Substantial improvement"* is one of the desirable negotiation outcomes. It would likely be achieved by the use of "*Aggression*", "*Assertion*" and "*Reserved*" tactics with regard to the dispute source of "*Delay"*. In construction, the lack of information flow within the project team often causes erroneous decisions which in turn would lead to "*Delay*" (Sarker *et al*. 1998). "*Delay*" means the increase of time and costs of a project. In this situation, the process of making ground rule like "*Issues focused*" or "*Procedure focused*" may not be helpful, since the time for negotiation is limited (Fava and Velicer 1992). In this connection, the use of "*Aggression*", "*Assertion*" or "*Reserved*" tactics would help to create a dominating party. With the questioning skills of this party, the weakness of the other side's arguments can be exposed. This would force the other side to make concession and thus to achieve progress (Walton and McKersie 1993).

Furthermore, "*Position clarification*" is found to be another responsive negotiation outcome when "*Issues focused*" tactics are adopted. Negotiating parties tend to commit considerable resources towards defending their organizational effort. They would fall into a defensive position and take a hard line bargaining approach. With these negotiators' tactics, negotiating parties can undertake reality testing, as a means to improve and enhance their positions, the competency and responsibilities of the negotiating parties.

Concluding remarks

The contingent use of negotiators' tactics, i.e. the use of tactics appropriate to the circumstances is instrumental in deriving positive negotiation outcomes. This paper reports a study that examines this concept in construction dispute negotiation. To achieve this, a three-stage research study was conducted. Firstly, taxonomies of three negotiation dimensions: dispute sources, negotiators' tactics and negotiation outcomes were developed and confirmed by exploratory factor analyses (EFA) and confirmatory factor analyses (CFA) respectively (Stage I). Based on these factor structures, the contingent use of negotiators' tactics was examined (Stage II). Moderated multiple regression (MMR) was performed to track the moderating effect of tactics in achieving certain outcomes respective to the dispute source. These findings of this study supports the concept of contingent use of negotiators' tactics as the MMR results indicate that the achievability of an outcome through the use of certain tactics depends on the dispute source. It was found that the tactics of "*Progress seeking*" is the most versatile types of tactics. In addition, "*Delay*" is found to be a universal moderator that can moderate most of the tactic-outcome relationships. Further research into validating the developed MMR models is suggested. This would be of practical value with the data of live construction negotiation.

Acknowledgements

The authors would like to express their appreciations to the constructive comments of the editor and the reviewers. The work described in the paper was fully supported by a grant from the Research Grants Council of the Hong Kong Special Administrative Region, China (Project No. CityU-111606).

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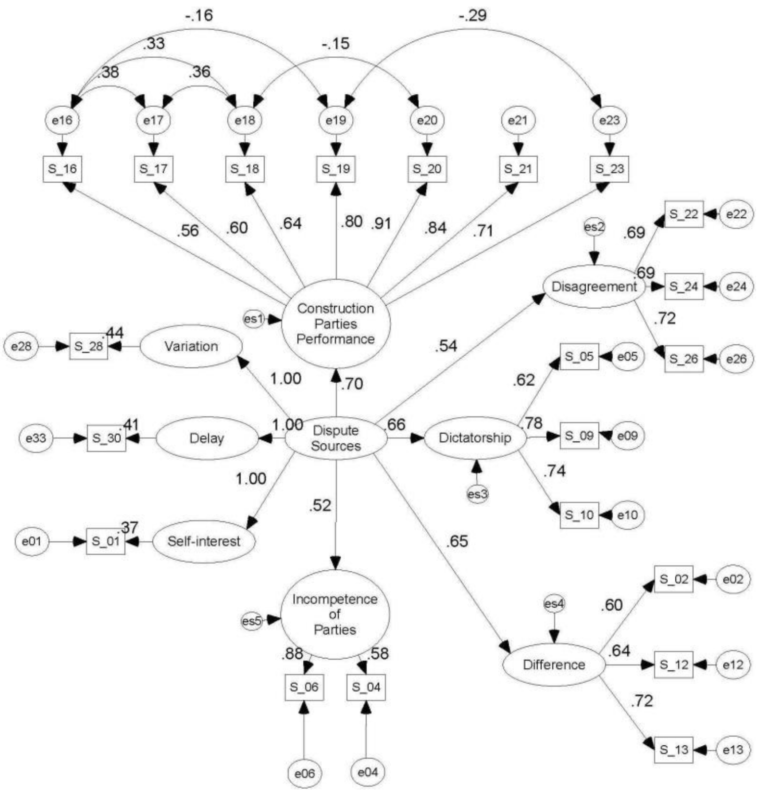

Figure 1 The refined model of construction dispute sources

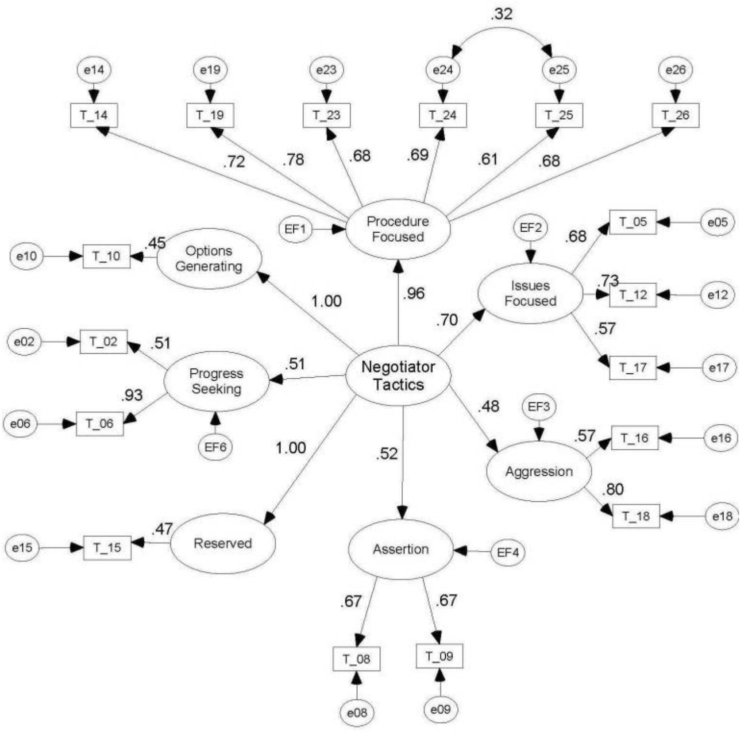

Figure 2 The refined model of negotiators’ tactics

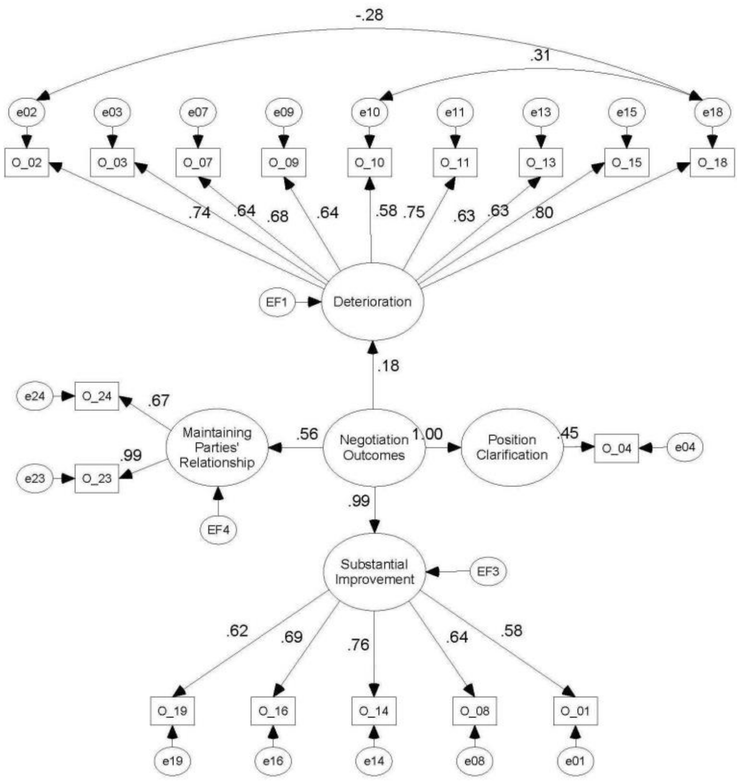

Figure 3 The refined model of negotiation outcomes

Table 1 List of construction dispute sources

Code	Construction Dispute sources[1,2]	Factor[3]
S_01	Parties only interested in their own interests not in settlement	6
S_02	Negotiators acted like adversaries	4
S_03	Negotiators focused unduly on money issues	--
S_04	Negotiators behaved far less creative than the parties could be	5
S_05	Parties got negative emotional in the negotiation	3
S_06	Parties assumed what the other parties' view as what they perceived directly	5
S_07	Parties tended to become hostile and aggressive to maintain a positive self-view	--
S_08	Parties perceived the other parties are lack of good faith	--
S_09	Negotiators treated their decision as the only solution to the problem	3
S_10	Parties acted unfairly or exploitatively, violating other’s rights	3
S_11	Information available was insufficient for the parties to make decision	--
S_12	Parties interpreted existing information differently	4
S_13	Parties were being misinformed in the current situation	4
S_14	There was a power imbalance between the parties making one-side decision	--
S_15	There was a rigid hierarchy which inhabits the progress of negotiation	--
S_16	Inadequate site and/or soil investigation	1
S_17	Late giving of possession from Client	1
S_18	Contractor ceases work on the site	1
S_19	Clients fails to pay for variation claims	1
S_20	Delay interim payment from Client	1
S_21	Non-payment to sub-contractor by Main Contractor	1
S_22	Argument on the cost of extension of time claimed by Contractor	2
S_23	Late release of retention monies to Contractor	1
S_24	Argument on the measurement and valuation of contracted work	2
S_25	Argument on the assessment of liquidated and ascertained damages against Contractors	--
S_26	Late instructions from Architect or Engineer	2
S_27	Architect/Engineer dissatisfies the work progress of Contractor	--
S_28	Changes of scope due to extra work	8
S_29	Errors/substantial changes in Bills of Quantities	--
S_30	Delayed due to Contractor	7

[1]Construction Dispute sources were measured on Likert scale from (1) least significant to (7) most significant
[2] Cox and Thompson 1997; Kumaraswamy 1997; Molenaar *et al*. 2000; Ren *et al*. 2001; Sarker *et al*. 1998; Trost and Oberlender 2003
[3] Dispute sources Factor 1: Non-performance of contract; Factor 2: Disagreement; Factor 3: Dictatorship; Factor 4: Difference; Factor 5: Incompetence of parties; Factor 6: Self-interest; Factor 7: Variation

Table 2 List of negotiators' tactics

Code	Negotiators' tactics[1,2]	Factor[3]
T_01	I tried to identify the core issues and clarify where each party stands	--
T_02	I attempted to increase time pressure by mentioning the deadline of negotiation	6
T_03	I focused on the sequence of issues to be discussed and bundled the related issues only	--
T_04	I maximized the information received while minimizing the information given	--
T_05	I began with easy issues on common ground	2
T_06	I mentioned the increase in costs associated with continuing disputes	6
T_07	I made argument in support of my own position	--
T_08	I attempted to reveal and acknowledge personal feelings	4
T_09	I increased argumentation, threats and assertion of needs	4
T_10	I brainstormed various options based on the interests of all parties	7
T_11	I used my authority to make decision in my favor	--
T_12	I tried to employ fair and objective criteria, standards and procedures	2
T_13	I pretended not to be in a hurry nor interested in the issues in discussion	--
T_14	I gave occasional summaries to subject the opponent to reality testing	1
T_15	I tried to hide my bottom line	5
T_16	I tried to pay others for information	3
T_17	I used information exchange as a mechanism for establishing trust	2
T_18	I encouraged colleagues to give mid-discussion summaries	3
T_19	I suggested a range of options or trade-offs across issues	1
T_20	I attributed bad faith to the other parties which I found to be wrong	--
T_21	I tried to place a high priority on achieving the other parties' goals	--
T_22	I stated requirement and expected compliance	--
T_23	I accepted the other parties' point of view but not their offer	1
T_24	I gave counter-proposal to the other parties' offer	1
T_25	For an open agenda, I retained my flexibility until the end of negotiation	1
T_26	I attempted to get opportunities for breaks and caucuses	1
T_27	I attempted to get an agreement of the parties upon a set of norms, standards or criteria	--

[1] Negotiators' tactics were measured on Likert scale from (1) least useful to (7) most useful
[2] Rahim 2001; Volkema and Fleury 2002; Walton and McKersie 1993
[3] Negotiators' tactics Factor 1: Procedure focused; Factor 2: Issue focused; Factor 3: Aggression; Factor 4: Assertion; Factor 5: Reserved; Factor 6: Progress seeking; Factor 7: Options generating

Table 3 List of negotiation outcomes

Code	Negotiation outcomes[1,2]	Factor[3]
O_01	Innovation, creativity and growth in the organization were stimulated	2
O_02	Job stress, burnout and dissatisfaction made people feel defeated and demeaned	1
O_03	Communication between individuals and groups were reduced	1
O_04	The negotiating parties were forced to articulate and clarify their positions	4
O_05	A climate of hostility, distrust and suspicion was developed	--
O_06	Organizational decision making was improved	--
O_07	The relationships between groups and individuals were damaged	1
O_08	An optimal synergistic and beneficial solution was created	2
O_09	Job performance was worsened because of wasted resources	1
O_10	Active or passive resistance to change was increased	1
O_11	Organizational commitment and loyalty were affected	1
O_12	It stimulated more proposal and counterproposals	--
O_13	Positional and irrelevant argument, and even personal attack were resulted	1
O_14	It stimulated the discussions about the workability of solutions	2
O_15	Information exchange reduced and even false information was used	1
O_16	A greater level of agreement with the other parties' proposal was resulted	2
O_17	The level of conflict was reduced	--
O_18	Stalemate, deadlock or impasse appeared	1
O_19	The time in generating solutions was reduced	2
O_20	The issue was postponed until a better time	--
O_21	Long-standing problems surfaced and were dealt with	--
O_22	Less future disputes were likely to be made	--
O_23	Relationship between parties was kept intact	3
O_24	Trust was developed between parties	3

[1]Negotiation outcomes were measured on Likert scale from (1) least achieved to (7) most achieved
[2] Friedman *et al*. 2000; Rahim 2001; Walton and McKersie 1993
[3] Negotiation outcomes Factor 1: Deterioration; Factor 2: Substantial improvement; Factor 3: Maintaining of parties' relationship; Factor 4: Position clarification

Table 4 Composition of respondents (by experience in construction negotiation)

Experience	Response	Percentage (%)
Below 5 years	16	17.4%
5-10 years	23	25.0%
11-15 years	20	21.7%
16-20 years	23	25.0%
Above 20 years	10	10.9%
Total	**92**	**100.0%**

Table 5 Appropriateness statistics of the three exploratory factor analysis (EFA) results

	Dispute sources	**Negotiators' tactics**	**Negotiation outcomes**
KMO	0.716	0.799	0.808
Bartlett's Test of Sphericity			
X^2	1433.81	1117.74	1030.40
DF	435	351	276
Sig.	0.000	0.000	0.000

KMO: Kaiser-Meyer-Olkin Measure of Sampling Adequacy; x^2: Chi-square; DF: degree of freedom; Sig.: significance

Table 6 The results of exploratory factor analysis of the three negotiation dimensions

Dimension	**Factor**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Dispute	Eigenvalue	8.302	2.942	2.031	1.793	1.545	1.449	1.238	1.049
sources	% of Variance	27.674	9.808	6.768	5.977	5.149	4.829	4.125	3.496
Negotiators'	Eigenvalue	7.906	2.839	1.801	1.494	1.346	1.214	1.166	
tactics	% of Variance	29.282	10.516	6.669	5.535	4.984	4.495	4.320	
Negotiation	Eigenvalue	6.952	4.180	1.598	1.124				
outcomes	% of Variance	28.968	17.417	6.657	4.685				

Table 7 Goodness of Fit indices and their threshold values

GOF	**GOF range** [i]	**Threshold**
x^2/DF	0 or above	1.00-3.00 [ii]
GFI	0 (no fit) to 1 (perfect fit)	0.76 or above [iii]
TLI	0 (no fit) to 1 (perfect fit)	0.70 or above [iv]
CFI	0 (no fit) to 1 (perfect fit)	0.73 or above [v]
RMSEA	0 (perfect fit) to 1 (no fit)	0.1 or below [vi]

[i] Hair *et al*. 1998 [ii] Jashapara 2003 [iii] Arrindell *et al*. 1999 [iv] Arrindell *et al*. 1999; Chou and Bentler 1990 [v] Brennan and Brannan 2005; Chou and Bentler 1990 [vi] Bollen and Long 1992; Browne and Cudeck 1993

GOF: Goodness of fit indices, x^2/DF: Chi-square/degree of freedom, GFI: Goodness of fit index, TLI: Tucker-Lewis index, CFI: Comparative fit index, RMSEA: Root mean square error of approximation

Table 8 Overall goodness-of-fit measures of the three structural equation models

GOF		**x^2/DF**	**GFI**	**TLI**	**CFI**	**RMSEA**
DS	Initial	2.035	0.734	0.721	0.755	0.107
	Refined	1.905	0.762	0.756	0.792	0.1
NT	Initial	1.758	0.806	0.787	0.821	0.091
	Refined	1.708	0.816	0.801	0.834	0.088
NO	Initial	1.224	0.858	0.943	0.952	0.05
	Refined	1.031	0.884	0.992	0.994	0.039

GOF: Goodness of fit indices, x^2/DF: Chi-square/degree of freedom, GFI: Goodness of fit index, TLI: Tucker-Lewis index, CFI: Comparative fit index, RMSEA: Root mean square error of approximation

DS: Dispute Sources; NT: Negotiators' Tactics; NO: Negotiation Outcomes

Table 9 Summary of the 28 significant moderated multiple regression models

	Negotiators' tactics	Procedure focused		Issues focused						Aggression	Assertion	Reserved			Progress seeking							Options generating	Total #	Total *
Dispute sources	Construction parties' performance														#							#	2	3
	Disagreement															#							1	1
	Dictatorship			#													#						2	2
	Differences				#																		1	2
	Incompetence of parties					#												#					2	2
	Self-interest	#					#					#							#				3	4
	Delay		#					#		#	#		#							#			6	**9**
	Variation								#					#							#		3	5
Negotiation outcomes	Deterioration		*					*							*		*				*	*		6
	Substantial improvement	*	*		*					*	*	*	*	*	*	*		*		*	*			**13**
	Maintaining parties' relationship				*								*							*				3
	Position clarification			*		*	*		*					*					*					6
	Sub-total of #	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21	
	Sub-total of *	1	2	1	2	1	1	1	1	1	1	1	2	2	2	1	1	1	1	2	2	1		28
Grand-total of contingent use		3		**7**						1	1	5			**10**							1		28

Dispute source that responds to particular tactics such that different negotiation outcomes are achieved; * Negotiation outcomes that are achieved with the particular combination of sources and tactics