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An Instrument for Identification of Intention to Settle in Project Dispute Negotiation

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Abstract

Negotiation is widely known as the most effective way to resolve differences. Traditions of negotiation studies have contributed to this area by providing prescriptive, quantitative, and behavioral research to improve the success of negotiation. This study argues that negotiators' settlement intention underpins the functionality of advice under the three traditions of negotiation studies. The study aims to establish ways to identify the intention to settle (ITS) of project dispute negotiators. A longitudinal study was conducted. The questionnaire was designed by operationalizing an ITS framework that includes technique-based, relationship-based, and cognition-based intention from a thorough literature review. Two rounds of data were collected from the same group of project negotiation practitioners at a three-month interval. The time consistency of the responses was supported by the results of a paired t-test. The same ITS structure was achieved through the test and retest methodology with the two sets of cross-sectional data, supporting the reliability of the structure. The framework was validated to be stable across time by testing the longitudinal factorial invariance. With these steps, a robust ITS identification instrument was developed. The practical applications of the ITS instrument were confirmed by

practicing project dispute negotiators. The study theoretically contributes to the body of knowledge by offering a validated ITS framework. On the practical side, the ITS framework is further developed into an identification instrument that can be used in negotiation studies. Notably, the ITS identification instrument can be incorporated into the negotiation decision mechanisms to support negotiators in gauging how conducive in terms of intention to the settlement of a negotiation.

Keywords: Identification instrument; Intention to settle; Longitudinal study; Project dispute negotiation; Test-retest methodology.

Practical Applications

The primal traditions of negotiation studies (i.e., prescriptive, quantitative, and behavioral) have an implicit premise that negotiators are rational economic men with the intention to resolve disputes. This may not always reflect reality, especially regarding the intention to resolve. To assist negotiating parties in better understanding the prospect of negotiation, this study develops an instrument for the identification of intention to settle (ITS) in project dispute negotiation. A longitudinal study with a mixed-methods approach is used to identify negotiators' ITS. The finding supports that negotiators' settlement intention is a multidimensional construct that can be manifested as technique-based, relationship-based, and cognition-based intention. The work contributes in three respects: (1) theoretically, the robust ITS framework complements and underpins the functionality of prior negotiation studies; (2) in practice, the ITS identification instrument can assist negotiation decisions, especially in assessing the readiness to strive for a negotiated settlement; (3) the test-retest methodology used in this study can be applied to other project management studies to enhance the reliability and validity of the findings.

1. Introduction

It appears that no engineering project is free from disputes (Cheung and Yiu 2006; Tang et al. 2020). Unrestrained use of special conditions, the imprecise definition of terms, frequent design changes, and force majeure events are typical causes of engineering disputes (Arcadis 2021). Prompt settlement of disputes would prevent conflict aggravation and the associated negative impacts on projects. Although a series of binding or nonbinding dispute resolution methods can be deployed, negotiation remains the most recommended resolution means (Yousefi et al. 2010). Technically, negotiation is a joint decision-making process through which differences are reconciled for the attainment of mutual benefit (Murtoaro and Kujala 2007). In fact, negotiation has been recognized as the least hostile yet the most resource-efficient way to settle disputes (Cheung and Chow 2011; Yousefi et al. 2010). Because of its popular and frequent use, negotiation has been one of the core topics within project management studies (Bazerman et al. 2000; Brett and Thompson 2016). There are three major traditions of negotiation studies.

The first tradition of negotiation studies is exemplified by prescribing "golden rules" that are believed to be workable in most instances (Fisher et al. 2011; Kennedy 1997). This collection of studies can also be identified as the prescriptive school (Carnevale and Pruitt 1992) that primarily offers "dos and don'ts" in negotiation. For example, Fisher et al. (2011) suggested that negotiation should be principled, which starts with the analysis of disputed issues, parties' interests, and potential proposals, thus avoiding positional bargaining. Whitney (1983) specified that negotiation is a set of learned skills that should be integrated into daily work of what, who, where, when, and how. On the same note, Beasor (2017) believed that good negotiators are equipped with a collection of techniques and strategies that can be deployed to suit the circumstances.

The second tradition is the quantitative models that have flourished since the development of game theory (Nash 1950). The applications of economic decision criteria and mathematical optimization techniques have been well received by advocates of rational decision-making (Murtoaro and Kujala 2007). Quantitative models essentially aim to determine settlement options that would provide the maximum utility to the disputants collectively. Decision frameworks are prepared and work with utility functions that reflect the interest of the parties. For example, the client and contractor make their decisions independently, and through exchanges of proposals, their pay-off functions are adjusted accordingly. Potential settlement packages can thus be suggested by the optimization model (Murtoaro and Kujala 2007). The quantitative tradition posits that negotiation decisions are based on optimal choices through analyzing options under competitive conditions. This rational decision-making approach assumes that parties can have sufficient information to assess the trade-offs of their counterparts (Thompson et al. 2010).

The first two traditions assume that negotiators are rational and all-knowing, ignoring to couple with individual personalities and the complexity of negotiation situations (Raiffa 1982; Thompson et al. 2010). The third tradition is the behavioral school focusing on the reasons why certain negotiation behaviors are practiced. The behavioral school is more descriptive and has been largely the province of psychologists and organization theorists. The behavioral school relies heavily on empirical evidence through experimentation and systemic field observations. For example, Rahim (1983) integrated the dual-concern model with five types of negotiating styles (i.e., integrating, forcing, yielding, avoiding, and compromising). Furthermore, social–psychological studies have researched negotiation approaches, behaviors, and outcomes while considering the situational environment (Bazerman et al. 2000; Brett and Thompson 2016). In this regard, Thompson (1990) summarized the influence of individual

differences and motivational and cognitive factors on dyadic negotiation. Pinkley (1990) uncovered negotiators' multidimensional interpretations of conflict, named "conflict frames": relationship versus task; emotional versus intellectual, and compromise versus win. Curhan et al. (2006) tested what negotiators value when they negotiate. Cheung et al. (2006) investigated the relationships between negotiating styles and negotiation outcomes, with results suggesting how to facilitate effective negotiations.

The three traditions of negotiation studies have provided the essential conceptual bases for understanding negotiation. One important assumption of these studies is that negotiators consider successful settlement their responsibility and hence are willing to settle. However, project dispute negotiations may not squarely meet the assumption of the rational economic man selecting the optimal solution. Human fallacies, cognitive limitations, and opportunism are not uncommon (Williamson 1993). Prior studies revealed that negotiators might deliberately throw in unreasonable demands, stall the process, or protract decisions, thus hampering sensible resolution (Cheung and Chow 2011). In some instances, emotional negotiators may even abandon a negotiation without any rational course (Liberman et al. 2010). It is therefore advocated that the very foundation of a negotiated settlement in project dispute negotiation is the negotiators' intention to settle (ITS). To achieve that, this study conceptualizes ITS in project dispute negotiation. Applying a mixed-methods approach, an ITS identification instrument is developed. Implications for the use of the instrument are discussed.

2. A Robust ITS Identification Tool

A longitudinal study was conducted to develop a robust instrument for the identification of ITS. The flow of the study is illustrated in Fig.1.

Insert **Fig. 1** about here

The qualitative meta-analysis approach was adopted to conceptualize and synthesize the existing body of knowledge of negotiators' intention (Sandelowski and Barroso 2006). The ITS framework was derived with measurement items operationalizing from the intention- and negotiation-related literature review. The qualitative approach is illustrated in Step 1, and the questionnaire was designed accordingly.

The empirical study with quantitative components was then followed (Steps 2 to 9). To develop a robust and time-consistent ITS identification instrument, a longitudinal study that contains two rounds of data collection from the same respondents is suggested (Kline 2013). Specifically, the quantitative test includes a paired t-test to confirm the stability of the responses (Hsu and Lachenbruch 2014). A test-retest method was adopted to augment the reliability and validity of the underlying constructs (Kline 2013; Li and Cheung 2018). The longitudinal factorial invariance test was also used to verify the time consistency of the instrument (Meredith 1993). ANOVA test was further applied to assess the divergence of answers among different groups of respondents (Beddo and Kreuter 2004).

The qualitative approach of the semistructured interview was finally adopted (Step 10). Five professionals from the engineering industry were invited to discuss the usefulness of the developed instrument. The details of each method are described in respective steps.

2.1 Step 1: Development of ITS manifestations

Ajzen (2011) summarized that intention reflects readiness to perform. Intention is a subconscious and imperceptible concept that can be manifested through human behaviors (Johari and Jha 2020). Ajzen

(2011) suggested operationalizing intention by asking contextualized questions, such as whether people are making sufficient preparation, whether people are actively engaged, and how devoted people are to work toward the goals. Accordingly, the manifestations of intention to settle were developed with reference to settlement facilitating behaviors that can represent negotiators' willingness to resolve differences (Lin and Cheung 2021). The qualitative approach was applied to collect appropriate publications with selected key terms that focus on settlement facilitators in two-party negotiation. The key terms, including *negotiation, negotiation success, negotiation performance, negotiated settlement, intention to settle, intention to negotiate, willingness to settle,* and *settlement intention*, were screened in the major databases (e.g., ASCE®, ScienceDirect®, and Google Scholar®).

With a thorough literature review, Lin and Cheung (2022) have proposed an ITS framework in the context of project dispute negotiation that includes three forms of intention: technique-based, relationship-based, and cognition-based intention, which respectively represent negotiators' willingness to settle when they deal with negotiation issues, their counterpart, and themselves. This classification aligns well with the work of Thompson (1990), who suggested measuring negotiation behaviors through the perception of the negotiation conditions, perception of the other party, and perception of the self. Curhan et al. (2006) also found that the value of negotiation includes instrumental-, relationship-, and self-related aspects. Specifically, technique-based intention illustrates negotiators' technical moves about active preparation at the prenegotiation stage and proposing practical solutions during the negotiation process (i.e., preparation and integration). Relationship-based intention is built on negotiators' interactions with their counterparts that show their kindness and compromise to maintain ongoing relationships (i.e., goodwill and continuity). Cognition-based intention addresses negotiators' self-perception about whether they have the desire and confidence to engage in the negotiation (i.e.,

commitment and self-efficacy).

The proposed ITS identification instrument builds on this framework (Lin and Cheung 2022). The questionnaire including operationalized ITS identification statements is developed accordingly. Necessary linguistic adjustments were made to fit the negotiation context and the first-person narration. For example, Item 5, "I tried to understand the perspectives from my counterpart's point of view", was derived from "The opponent sought the understanding of our positions and opinions" (Lu et al. 2017). Item 14, "I had a strong sense of belonging to my project team", was converted from "This organization had a great deal of personal meaning for me" (Allen and Meyer 1990). The manifestations of ITS are listed in Table 1. These described behaviors are proper arrangements that negotiators are apt to perform if a negotiated settlement is targeted. Six constructs and 18 items comprised the three-form ITS framework that was then tested in the following empirical steps.

Insert **Table 1** about here

2.2 Steps 2 and 5: Data collection

An 18-item questionnaire was obtained through the qualitative stage. With that, a longitudinal study with two rounds of data was applied (Kim and Ji 2009). This approach is also called test-retest methodology (Hinkin 1995). The first-round survey was conducted in May 2021 (Time 1), when the respondents were informed that they were also expected to participate in the same survey three months later. A total of 729 questionnaires were distributed, and 171 valid answers were received at Time 1, representing a 23.46% response rate. The second-round survey took place in September 2021 (Time 2). Out of the 171 experts who responded at Time 1, 113 replied at Time 2. The amount of data is considered

177 sufficient, as 113 is more than five times the item number (n=18), the minimum dataset recommended
178 by Carpenter (2018). The three-month time interval between Time 1 and 2 is commonly used and
179 believed to be appropriate in this study. A short time interval, for example, one or two weeks, might
180 decrease the risk that an attribute has changed, but the possible issue is that respondents use the same
181 answer because of memory effect (Polit 2014). The use of a three-month time interval can minimize the
182 memory effect of Time 1 answers. In addition, the contextual backgrounds of the respondents would
183 not have experienced major changes given the nature of the long project duration (Kline 2013).

184 The survey was mainly conducted online, with respondents coming from Hong Kong government
185 works departments, the Hong Kong International Arbitration Centre, and the Hong Kong Institution of
186 Engineers. The respondents were identified by their email addresses to ensure two rounds of answers.
187 The survey mainly included two parts. Part A collected respondents' personal professional-related
188 information, such as their organizational type and work experience. In Part B, respondents were required
189 to recall a finished project dispute negotiation they were involved in and indicate the degree of
190 agreement that most represented their negotiation behaviors, from 1 (strongly disagree) to 7 (strongly
191 agree). The data set includes a wide range of professions in the engineering field. Moreover,
192 approximately 60% of the respondents have more than five years of project negotiation experience,
193 guaranteeing the quality of the data. The profile of the respondents is illustrated in Table 2.

194

195 Insert **Table 2** about here

196

197 **2.3 Comparison of the two-round survey responses**

198 To ensure the stability of the response, the two sets of data were first subjected to a paired t-test. It is a

typical way to compare the differences between two types of variables for the same subject, with the variables separated by time (Hsu and Lachenbruch 2014). This study adopted the paired t-test to measure whether negotiators' settlement intention experienced a significant change during the three-month interval. The results are shown in Table 3. The paired differences of the mean responses ranged from -0.239 to 0.221, which can be considered close to zero. Moreover, with the null hypothesis (H_0) assuming that the mean difference is equal to zero, all 18 items have nonsignificant results ($p>0.05$), thus supporting H_0. The paired t-test results illustrate that the two rounds of responses are stable and support the time consistency of the two rounds of responses.

Insert **Table 3** about here

2.4 Steps 3 and 6: Principal component factor analysis (PCFA)

A test-retest method with principal component factor analysis **(**PCFA) and confirmatory factor analysis (CFA) was conducted to confirm the reliability and validity of the underlying ITS constructs. PCFA was applied in Step 3 (test, first-round data) and Step 6 (retest, second-round data). With the first-round data, Bartlett's test of sphericity and Kaiser–Meyer–Olkin (KMO) were calculated to ensure that the data were appropriate for factor analysis (Cerny and Kaiser 1977). The results showed that Bartlett's test of sphericity ($p<0.001$) was significant, and the KMO value (0.837) was larger than the threshold of 0.6 (Boateng et al. 2018). Factor analysis with varimax rotation was conducted and extracted six factors that were consistent with the category suggested in Table 1. Moreover, the total variance explained by the six factors achieved 73.675%, indicating a satisfactory level (Boateng et al. 2018). The factor matrix is shown in Table 4, in which all factor loadings are higher than 0.45 (Carpenter 2018).

Insert **Table 4** about here

With the extracted factor groupings, reliability analysis was further conducted to test the relationships among the items and assess the overall consistency of the instrument (Hair et al. 2013). Reliability analysis was carried out by (1) Cronbach's alpha, (2) inter-item correlation, and (3) item-total correlation. Cronbach's alpha measures the internal consistency of items, and above 0.60 is regarded as an acceptable level in social science (Moss et al. 1998). With the first-round data, Cronbach's alpha for all items was 0.899, and the values for the three ITS forms and six constructs were all above 0.6, as shown in Table 4. Inter-item correlation represents the degree of correlation between each pair of items in a set, and a range of 0.2-0.7 is suggested for an acceptable consistency (Li and Cheung 2018). As shown in Table 5, except for the correlation between Items 14 and 15, all the remaining items were within the range. The item-total correlation was performed to check whether each item was consistent with the average of the others. A value above 0.3 indicates that items share a good correlation and a satisfactory homogeneity (Boateng et al. 2018). The results of the item-total correlation coefficients ranged from 0.427 to 0.725, reaching the threshold. The PCFA results with the reliability analysis in the first-round data collectively indicate the satisfaction of the structure.

Insert **Table 5** about here

The same process was conducted to retest the second-round response. Bartlett's test of sphericity ($p<0.001$) and KMO (0.862) were significant, thus allowing the factor analysis process. The same six-

243 factor grouping was obtained (Table 4) and contributed a 77.571% explanation. Moreover, all factor
244 loadings were higher than 0.45. Cronbach's alpha (Table 4) and inter-item correlation (Table 6) were
245 retested, indicating acceptable levels. The values of item-total correlation of the second-round data
246 ranged from 0.465 to 0.725, which were also beyond the threshold of 0.3. Based on the reliability
247 analysis results, the proposed ITS identification instrument collectively achieved the reliability
248 requirements.

249

250 Insert **Table 6** about here

251

252 **2.5 Steps 4 and 7: Confirmatory factor analysis (CFA)**

253 A confirmatory factor analysis (CFA) was further followed to validate the ITS structure in Step 4 (test,
254 first-round data) and Step 7 (retest, second-round data) (Morin et al. 2015; Worthington and Whittaker
255 2006). The CFA results of goodness-of-fit (GOF) indices, including absolute fit indices (McDonald and
256 Ho 2002), incremental fit indices (Leung et al. 2005), and parsimonious fit indices (Hair et al. 2013;
257 Xiong et al. 2015), are shown in Table 7. All GOF indices achieve the desired levels, suggesting that
258 the proposed ITS instrument fits well with both test and retest datasets. The results of the two rounds of
259 CFA are illustrated in Fig. 2 and Fig. 3.

260

261 Insert **Table 7** about here

262

263 Insert **Fig. 2** about here

264

Insert **Fig. 3** about here

2.6 Step 8: Longitudinal factorial invariance examination

To further examine the time consistency of the identification tool, a longitudinal CFA aligning the two sets of cross-sectional data was suggested to test the longitudinal factorial invariance (Kim and Ji 2009; Widaman et al. 2010). The longitudinal factorial invariance that requires the equivalence of factor loadings across Time 1 and 2 was applied (Kim and Ji 2009). As shown in Fig. 4, the residual errors of the same constructs in the two cross-sectional models were correlated.

Insert **Fig. 4** about here

The baseline model is named Model A, in which no equality constraints were added to the model parameters. Model B was tested with the constraints of all first-order factor loadings being equal across time (W1=rW1, W2=rW2, W3=rW3…, W12=rW12). Model C obtained stronger constraints that included the first- and second-order factor loadings being equal across time (W1=rW1, W2=rW2, W3=rW3…, W15=rW15). Model D extended the constraints by requiring all factor loadings to be invariant across time (W1=rW1, W2=rW2, W3=rW3…, W17=rW17). The routine of the longitudinal factorial invariance examination is to test and compare the GFIs of the models that are imposed with successive restrictions (Kim and Ji 2009). Table 7 shows the results of the GFIs of each longitudinal model, with all fit indices passing their respective thresholds. The comparison with the baseline model (Model A) was then calculated (Table 8). The values of ΔCFI were all smaller than 0.01, suggesting the

288 factorial invariance of the structure (Cheung and Rensvold 2002).

289

290 Insert **Table 8** about here

291

292 With all the steps of the paired t-test, test-retest reliability and validity, and longitudinal factorial
293 invariance, a robust and time-consistent ITS identification instrument with three intention forms and
294 six constructs were finally achieved.

295

296 **2.7 Step 9: ANOVA test**

297 Since the respondents were composed of different characteristics (i.e., gender, professions, years of
298 negotiation experience, and type of organization), an analysis of variance (ANOVA) test at a 5% level
299 of significance was conducted to assess the existence of any divergence in their opinions (Beddo and
300 Kreuter 2004). The developed three intention forms in the two-round data were separately tested with
301 results summarized in Table 9 (Step 9 of Fig.1). No significant difference is found among the group
302 means of gender and negotiation experience. The data of different types of professions show statistical
303 differences only in the second round of cognition-based intention ($p=0.010^*$). However, respondents
304 from different organizations (i.e., contractor, owner, and consultant) indicate significantly different
305 opinions on all three ITS forms with the two rounds of the survey. The same rankings are observed: the
306 contractor scored the highest, the owner second, and the consultant third. The LSD post hoc test, i.e.,
307 an equal-variance t-test, was conducted to analyze in more detail among organizational groups (Ng et
308 al. 2009). The mean differences were evaluated with the pairs of "contractor vs. owner", "contractor vs.
309 consultant", and "owner vs. consultant". The results showed that "contractor vs. consultant" has a

significant level of less than 0.05 with all ITS forms. “Contractor vs. owner” and “owner vs. consultant” were significantly different under the group of “relationship-based” and “cognition-based” in the first-round data. The mean values for corresponding results were summarized in Table 9 to better illustrate these relationships. The findings indicate the fact that the construction market is a buyer’s market (Wang et al. 2023). The contractor is more engaged in the negotiated settlement to maintain a harmonious relationship and seek future cooperation (Seo et al. 2021). Thus, the ITS scores of the contractor are always the highest among the three groups. The owner and the consultant can be considered to have a similar position, as consultants are agents of the owner and exercise sanctioning powers on behalf of the owner under the contract. They are generally in a dominant and favorable position in commercial deals, which is also reflected in their relatively lower settlement intention when compared with the contractor. The ANOVA and LSD posthoc test results help validate the differences in ITS expressions among different groups of respondents, thereby reducing the chances of partiality while drawing conclusions.

Insert **Table 9** about here

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3. Findings and Discussion

The findings are discussed in light of the whole ITS instrument and the three intention forms as follows.

3.1 The ITS identification instrument

Ajzen (1985) suggested that intention is a far better predictor of resultant behaviors as compared to other measures (e.g., satisfaction). The significance of identifying individuals’ intention has been

verified in various domains, such as marketing (Liu et al. 2018; Singh and Singh 2019), career development (Nimon and Zigarmi 2015), education (Eicher et al. 2014), and health care (Li et al. 2018). This study developed an ITS identification instrument with three intention forms: technique-based, relationship-based, and cognition-based, filling the gap of intention study in the negotiation domain. The primary use of this instrument is to detect the presence and the level of negotiators' settlement intention. The measurement statements can work as a checklist to indicate their behavioral tendencies. Negotiators in project dispute negotiations can gauge their readiness to negotiate in terms of settlement intention. The higher scores suggest a greater willingness to settle the dispute. The individual form of intention can also be calculated, providing insight into which aspect of intention should be reviewed. Assessing the counterpart's intention by using the instrument may inform the formulation of appropriate negotiating strategies.

3.2 The three intention forms

The technique-based intention, focusing on how negotiators treat negotiation issues when they desire to settle, is manifested by preparation and integration. Preparation includes work taken by negotiators with the aim of settling the dispute prior to the negotiation. A thorough preparation requires taking the time to think through what one wants, what alternatives are possible, and what the counterpart might value. Negotiation preparation is especially significant for the engineering project due to the complex technical matters and contractual network (Wang et al. 2021). Moreover, project dispute negotiation typically involves multiple issues requiring negotiators to consider the interests and priorities in order to establish the trading zone (Harinck and De Dreu 2004). Negotiators should approach the negotiating table with well-prepared notes on alternatives, acceptable settlement packages, and counterpart's

interests. The time used for preparation is considered to be well-spent. A general framework for discussion not only represents negotiators' attitude toward negotiation but also demonstrates their willingness to settle when a reasonable offer is proposed. In terms of integration, it is a way to actively exchange information with the aim to "enlarge the pie" (Rognes and Schei 2010). A common belief is that integration can facilitate "win-win" settlements (Qu and Cheung 2012). Contrary to the distributive approach, with which negotiators claim values at the expense of their counterpart, integration cares more about value creation and both parties' interests. A typical characteristic of integrated negotiators is that they are willing to trade off potential priorities. The spirit of adopting an open attitude at the risk of being exploited by their counterparts exhibits the settlement intention of integrated negotiators.

Relationship-based intention (i.e., goodwill and continuity) uses friendly interactions and long-term relationship consideration to show negotiators' settlement intention. In general, relationships between negotiators may spiral into vicious (e.g., contention and suspicion) or virtuous cycles (e.g., cooperation and interdependency), as the nature to respond similarly to others' actions. A gesture of goodwill is significant not only because it engenders a pleasant atmosphere but also because it facilitates trust – a vital means of securing desired actions from others (Chebet et al. 2015). Negotiators will view a course of action as more acceptable when it is suggested by someone they trust. However, if the communication style is not sufficiently empathetic, it will be hard to elicit honest responses (Low 2010). A skilled negotiator will show their goodwill by creating a secure communication platform to let their counterpart feel respectfully treated and comfortable in expressing their opinions. In addition, considering their long-term relationship also implies negotiators' positive attitude toward settlement. Negotiation is not a one-off case; more importantly, it is not the end of the work. Negotiators who place too much emphasis on their short-term benefits may engage in hard-bargaining strategies, such as

376 resorting to threats, extreme demands, or even unethical behaviors, to get the upper hand in a negotiation
377 (Yiu et al. 2018). However, the price to pay for this may ruin their relationship and further cooperation.
378 A long-term perspective is necessary for the business market, especially in the highly competitive
379 engineering industry. Offering concessions in negotiation can be seen as a useful practice to maintain
380 relationships and provoke reciprocation from the counterpart. The loss and sacrifice indicate negotiators'
381 willingness to settle and can be exchanged for more commercial opportunities in the future.

382 Commitment and self-efficacy form the cognition-based intention that illustrates the willing-to-
383 settle negotiators' devotement and self-confidence in negotiation. Commitment reflects people's strong
384 emotional attachment and the desire to achieve their membership in the work (Pool and Pool 2007).
385 Project dispute negotiation is a complicated and multitiered task that advocates full engagement.
386 Compared to low-committed negotiators, highly committed negotiators are more likely to stick to the
387 negotiating table and make real efforts to pursue problem-solving goals. In addition to commitment,
388 another good quality of negotiators is self-efficacy, or the tendency to have confidence in one's ability
389 to accomplish one's goals – the more confident the ability, the more motivated they are to practice
390 corresponding behaviors. Sullivan et al. (2006) suggested that negotiators with a high level of self-
391 efficacy will expect a successful settlement, find appropriate tactics to deal with different situations,
392 and be persistent in overcoming potential obstacles. Portraying confidence in negotiation, but not too
393 much, is a learned habit and commonly the goal of negotiation training programs.

394

395 **4. Semistructured interviews for the implication of the study**

396 Semistructured interviews were conducted to solicit views on the practical applications of the ITS
397 instrument (Step 10 of Fig.1). The interview guide involved background information for the

interviewees' negotiation practice, the details about their intention expression, and the application suggestions for the ITS instrument. All interviews were conducted by the authors. Six professionals (two from owners, three from contractors, and one from consultants) who are experienced in project dispute negotiation shared their opinions. The profile of the professionals is summarized in Table 10.

Insert **Table 10** about here

All the interviewees agreed that the three forms of settlement intention (i.e., technique-based, relationship-based, and cognition-based) were consistent with their experience of project dispute negotiation in the engineering industry. The main comments from the interviewees about the practical application of this ITS instrument are presented as follows.

(1) Identifying the readiness at the technique level

Whether negotiators are ready to negotiate and settle the problems has not received the deserved attention from both academia and industry. The interviewees mentioned that usually there is no clear reference to guide them in deciding when and how to commence dispute negotiation. Owner A with more than 20 years of work experience with the HK government said: "Some practitioners may hold the view that it is better to start a negotiation, even though positive results are not envisaged." The consulting engineer also argued that: "Whenever there are issues to deal with, negotiation will be involved, thus we negotiate almost every day." However, he also admitted that: "An immature negotiation is a waste of time as impasse is very likely. Conflict escalation may occur and senior management has then to be involved." All professionals accept that recovering from a failed negotiation

is always challenging, so negotiators should be cautious about pre-mature commencement.

Technique-based intention with "preparation" at the prenegotiation stage and "integration" at the negotiation process stage can help identify the readiness to settle from the "negotiation issues" perspective. The checklist of technique-based intention can be followed as a tool to analyze the negotiation conditions. Contractor A suggested that: "Negotiators should assess whether it is an opportune time to settle. If negotiation issues are linked and need to be collectively dealt with, it would be advisable not to rush into a negotiation when the consequences of the linked issues are not clear." Owner A said: "It does not make sense to initiate a negotiation without recognizing what is needed. When deciding to settle, negotiators should 'negotiate to yourself', meanwhile, 'put yourself in your counterpart's shoes' to figure out the priorities of both sides." Two professionals (i.e., Owner B and Contractor A) mentioned that it is their practice to conduct an internal review to discuss the negotiation conditions - evidence, potential alternatives, their bottom line, and any integrative solutions - before entering into a negotiation. The technique-based intention can well be attended to in this work stage as one of the prerequisites of settlement.

(2) Censoring the intention expression of both sides

Some interviewees believed that negotiators rarely have a holistic view of the negotiation. Owner A said: "Negotiators at the front-line level mainly follow the contract to do the 'right' things instead of adopting a problem-solving approach. Especially the early career negotiators may aim to 'win the game', not to 'settle the disputes'." Contractor B had a similar observation that negotiators are not always rational during the negotiation process. "Negotiators may naturally see the other party as an antagonist. Fearful of being taken advantage of, they may make ambitious, even unreasonable demands and other coercive tactics to dominate the negotiation," said Contractor B. Moreover, Contractor A found that

442 “Some negotiators assert that they are on the right side. Counter offers are viewed as retaliatory that
443 jeopardize the chance of further discussion.” When reviewing their negotiation experience, they all
444 admitted that they had taken some inappropriate behaviors that inadvertently deviated from their
445 settlement intention and ruined the relationship with their counterpart. In these regards, the proposed
446 intention framework can serve as a timely wake-up call.

447 Relationship-based intention can serve as the checklist for negotiators to review their behaviors
448 about how to deal with their counterpart: whether they have shown goodwill and considered their long-
449 term relationship. Contractor C suggested that: “This is especially important for the relatively weak
450 party, as there is a great chance that they would get more in building a rapport and trust relationship
451 with their counterpart.” For less experienced negotiators who lack the skill to manage emotions and
452 behaviors, the consulting engineer recommended incorporating the ITS tool as part of their negotiation
453 training manual, to remind them to adopt principled negotiation interactions.

454 In addition to censoring one’s expressions of settlement intention, relationship-based intention
455 behaviors can be deployed to evaluate the counterpart’s intention by observing their negotiating
456 behaviors. Experienced negotiators can thereby understand the messages underlying the actions taken
457 by their counterparts. If only one side has the intention to settle, while the counterpart is taking a tough
458 or hostile stance, the situation will not be conducive for a settlement. As Contractor B said: “When
459 facing a stubborn counterpart, making unilateral concessions can only appease him/her, but cannot elicit
460 reciprocal actions.” All the interviewees explained that they commonly rely on their experience or
461 intuition to sense their counterparts’ intention, which is relatively subjective. The form of relationship-
462 based intention provides tangible identifiers for negotiators to evaluate their counterpart’s negotiation
463 position. Better knowledge of the counterpart’s intention can help understand the strengths and

weaknesses of both sides, analyze the negotiation status, and timely adjust their decisions.

(3) Cultivating a positive mindset of negotiation

A negotiated settlement is less likely to be achieved if there is no intrinsic motivation to do so. Most professionals agreed that the influence of individual differences and their degree of engagement on negotiation performance is pivotal. Contractor C observed that: “The negotiation outcomes can vary with the negotiators involved. In fact, their beliefs such as willingness to work hard to achieve challenging tasks and confidence in their task-completion abilities, are critical reinforcers of negotiation success.” Owner B further added that: “Positive negotiation-related expectations and beliefs are the necessary quality of negotiators.”

Cognition-based intention, describing how conscientious and self-confident negotiators devote themselves to resolving their differences, would provide the benchmark for negotiators to look up to. Contractor C suggested that management should select appropriate negotiators as the main force with the aid of the cognition-based intention checklist. Furthermore, negotiation training should be supplemented with real-life mentoring from experienced colleagues who can serve as examples of qualified negotiators and plant positive negotiation mindsets.

To conclude, the developed ITS identification instrument can serve as a benchmarking tool to assist negotiators in keeping on a pragmatic course to settle disputes. The three forms of intention in the instrument respectively and elaborately display how a settlement willing negotiator would behave in dealing with the negotiation issues, their counterparts, and themselves. For less experienced negotiators, this instrument can serve as a training and operating manual to guide their negotiation preparation. Management can take this tool to review negotiators’ behaviors regularly or as deemed necessary. Having settlement intention is indispensable for a negotiated settlement, it is thus suggested that

identifying both sides' settlement intention should precede the choice of any negotiation tactics or strategies. The assessment of intention with this instrument can complement and contribute to the decision-making mechanism in negotiation, thereby enabling management to reach more reliable decisions. Project participants can take timely interventions if they are not on the right track.

5. Conclusion

Negotiating project disputes is an important project management function. The best result of a negotiation is having a settlement to put an end to the disputes. Prior negotiation studies can be arranged into three traditions: prescriptive, quantitative, and behavioral. One commonality among these traditions is that negotiators are having the necessary settlement intention. However, this condition may not hold in practice due to many unintended influences, such as cognitive limitations and human fallacies. This study identified a three-form ITS framework: technique-based, relationship-based, and cognition-based. The robustness of the framework is augmented by developing it into a time-consistent ITS identification instrument through the test-retest methodology. It is proposed that the instrument can be used to evaluate the presence and the level of negotiators' ITS. The practical applications of the instrument in dispute negotiation have been affirmed by practicing senior professionals with solid dispute negotiation experience. More specifically, the ITS instrument can enable management to identify their readiness to negotiate in terms of settlement intention. This informs the time to commence dispute negotiation. Furthermore, it can support a rational review of both sides' settlement intention during the negotiation process.

Data Availability Statement

Some or all data, models, or code that support the findings of this study are available from the corresponding author upon reasonable request.

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706 **Figure in this study**

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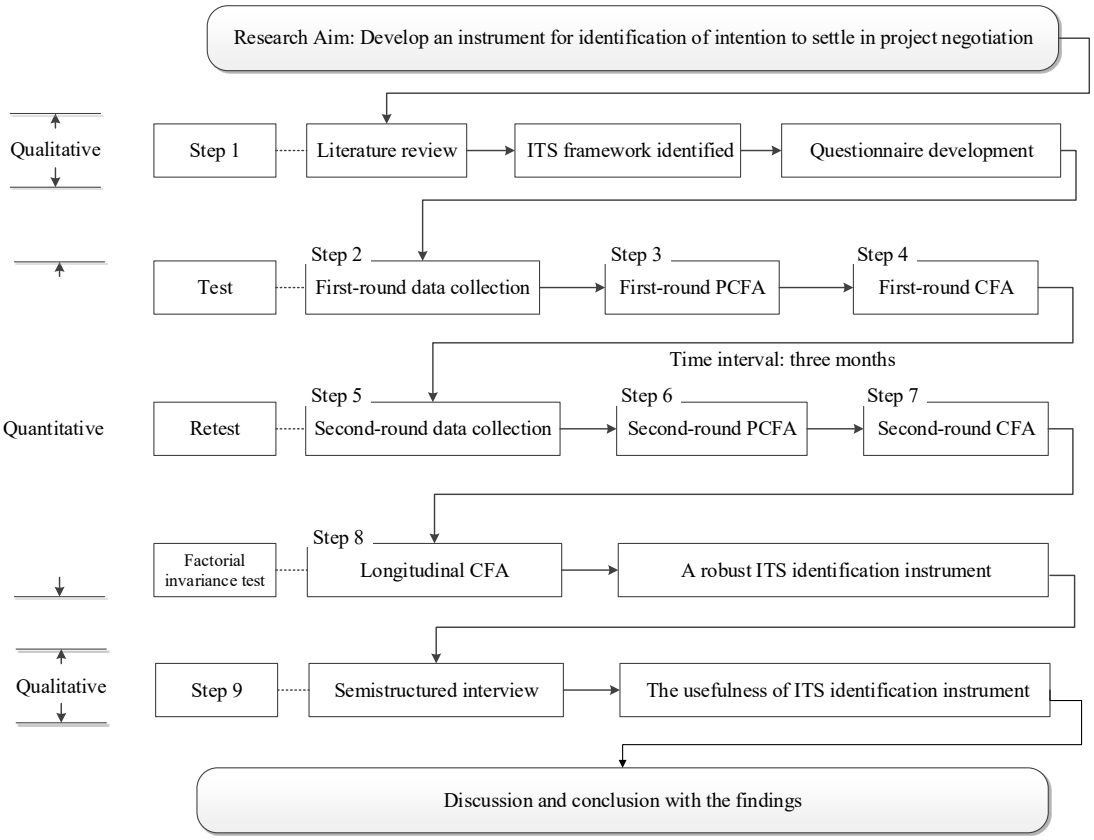

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710 **Fig. 1.** Identification of ITS: A "qualitative–quantitative" design

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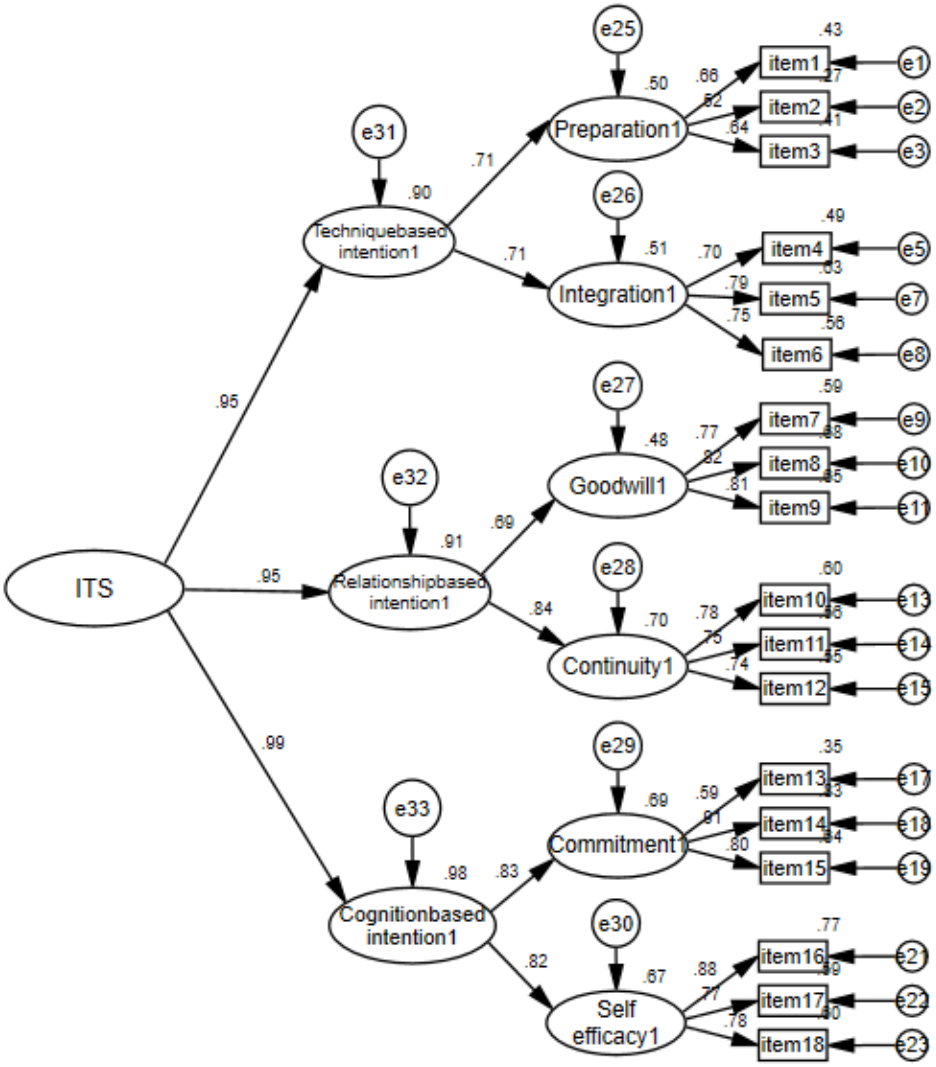

Fig. 2. CFA results with the first-round data (test)

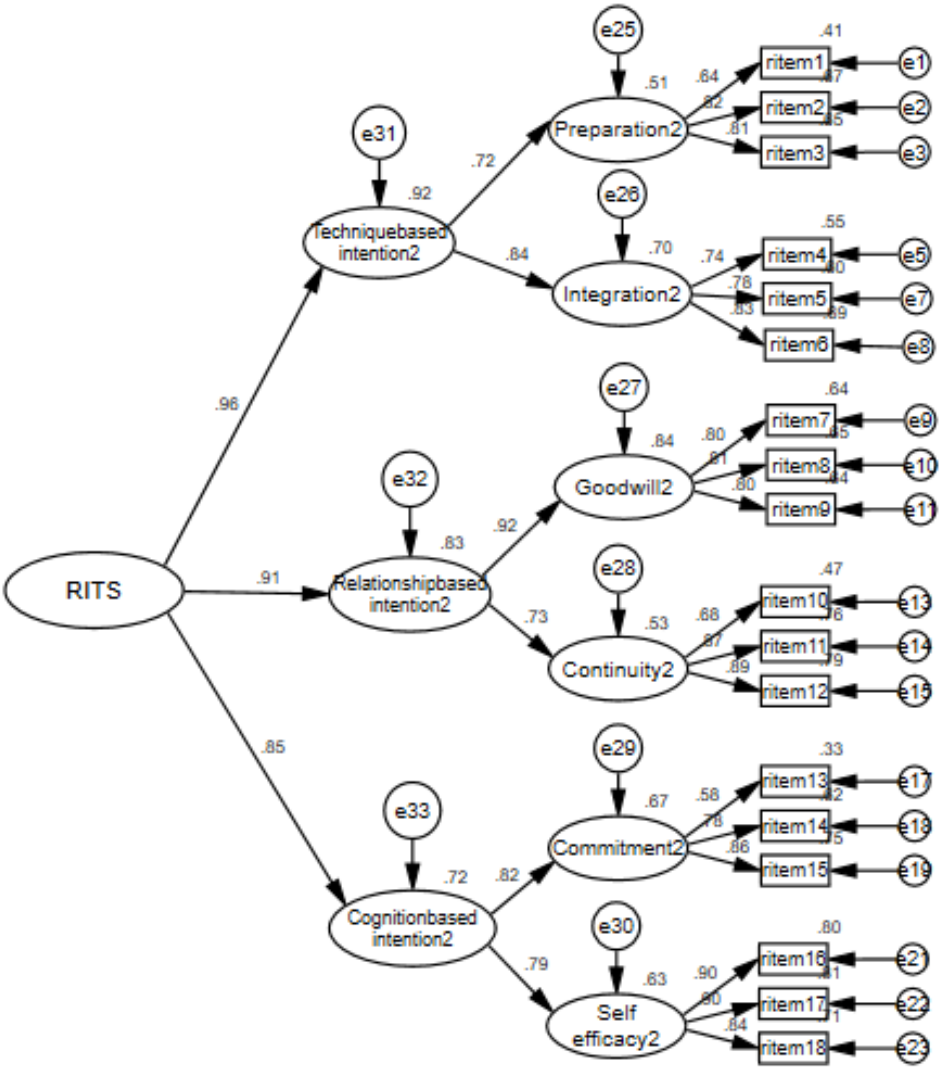

Fig. 3. CFA results with the second-round data (retest)

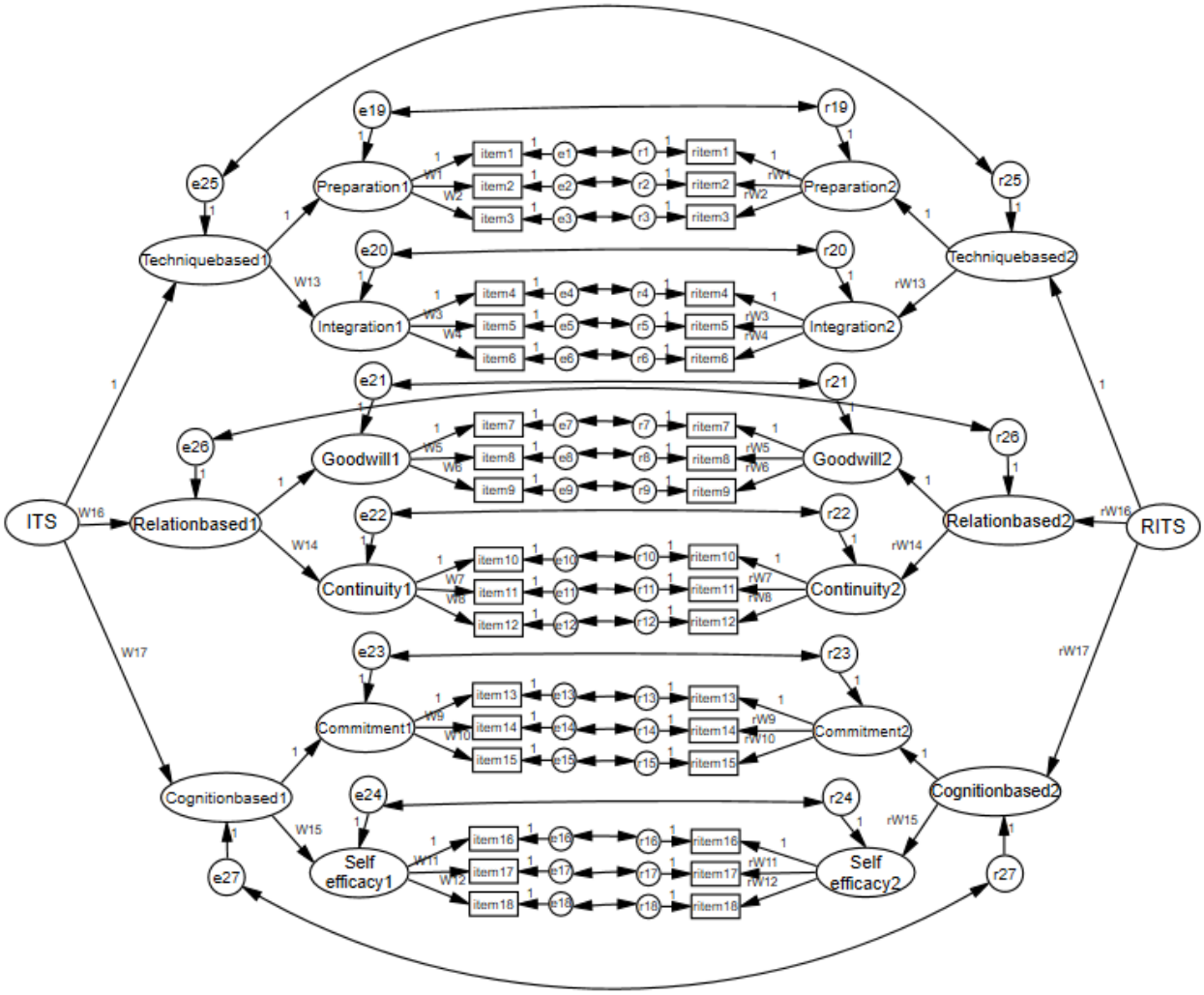

Fig. 4. Longitudinal CFA model

Table in this study

Table 1. Manifestations of intention to settle in CDN (adapted from Lin and Cheung 2022)

ITS forms	Manifestations of Intention to Settle	References
I. Technique-based intention		
Preparation	1. I allowed adequate time to collect the available information for the negotiation	(Cheung et al. 2009; Cheung and Chow 2011; Fisher et al. 2011; Li and Cheung 2019)
	2. I prepared the claim documents according to the contract requirements	(Cheung et al. 2008)
	3. I checked the accuracy of the evidence provided by my counterpart	(Galinsky and Mussweiler 2001; Li and Cheung 2019)
Integration	4. I brainstormed settlement options based on the interest of both negotiating parties	(Cheung and Chow 2011; Yiu et al. 2012)
	5. I tried to understand the perspectives from my counterpart's point of view	(Cheung and Chow 2011; Lu et al. 2017; Yiu et al. 2012)
	6. I suggested integrative solutions to seek the support of my counterpart	(Cheung and Chow 2011; Yiu et al. 2012)
II. Relationship-based intention		
Goodwill	7. I communicated with my counterpart honestly	(Lu et al. 2017; Suprapto et al. 2015)
	8. I avoided offensive communication with my counterpart	(Chebet et al. 2015; Macfarlane 2001)
	9. I respectfully listened to my counterpart's grievances	(Macfarlane 2001; Yiu et al. 2007)
Continuity	10. I made concessions to maintain good relationship with my counterpart	(Cheung and Chow 2011; Wang et al. 2021)
	11. I was willing to accept short-term losses on the belief that it will be balanced out in the long run	(Cheung et al. 2009; Suprapto et al. 2015)
	12. I took the long-term relationship and future collaboration with my counterpart into consideration	(Cheung and Chow 2011; Wang et al. 2021)
III. Cognition-based intention		
Commitment	13. I was willing to spend my leisure time to prepare for or work on the negotiation	(Allen and Meyer 1990; Chow et al. 2012)
	14. I had a strong sense of belonging to my project team	(Allen and Meyer 1990; Chow et al. 2012)
	15. I believed in the value of remaining loyal to my project team in resolving the dispute	(Allen and Meyer 1990; Chow et al. 2012)
Self-efficacy	16. I was confident in my ability to undertake the negotiation effectively	(Chen et al. 2001; O'Connor and Arnold 2001; Sullivan et al. 2006)
	17. I felt I was able to achieve most of our party's goals in the negotiation	(Chen et al. 2001; O'Connor and Arnold 2001; Sullivan et al. 2006)
	18. I felt I could perform quite well even the negotiation was tough	(Chen et al. 2001; O'Connor and Arnold 2001; Sullivan et al. 2006)

796 **Table 2.** Profile of respondents

Characteristics	Category	N	%
Gender	Male	83	73.45
	Female	30	26.55
Professions	Project manager	25	22.12
	Department manager	23	20.35
	Contract/ legal personnel	30	26.55
	Engineer	19	16.81
	Quantity Surveyor	16	14.16
Years of negotiation experience	< 5 years	46	40.71
	5-10 years	22	19.47
	11-15 years	19	16.81
	> 15 years	26	23.01
Type of organization	Contractor	60	53.10
	Owner	26	23.01
	Consultant	27	23.89

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Table 3. Round One and Round Two Survey Statistics and Paired Differences

	First-round response			Second-round response			Paired difference (first round-second round)					
	Mean			Mean						95% confidence interval of the difference		
Item	Statistic	Standard error	Standard deviation	Statistic	Standard error	Standard deviation	Mean	Standard deviation	Standard error mean	Lower	Upper	Significance (two-tailed)
1	6.00	0.093	0.991	5.85	0.114	1.212	0.150	1.143	0.108	-0.063	0.364	0.165
2	6.07	0.091	0.970	6.07	0.090	0.961	0.000	1.261	0.119	-0.235	0.235	1.000
3	6.26	0.066	0.704	6.23	0.082	0.876	0.027	0.930	0.088	-0.147	0.200	0.762
4	5.80	0.084	0.898	5.86	0.094	0.999	-0.062	1.144	0.108	-0.275	0.151	0.566
5	5.85	0.080	0.847	5.77	0.100	1.061	0.080	1.079	0.101	-0.121	0.281	0.434
6	5.72	0.094	0.995	5.73	0.093	0.991	-0.018	1.149	0.108	-0.232	0.197	0.870
7	5.81	0.100	1.068	5.91	0.090	0.960	-0.106	1.047	0.098	-0.301	0.089	0.283
8	5.73	0.103	1.094	5.97	0.093	0.986	-0.239	1.304	0.123	-0.482	0.004	0.054
9	5.82	0.089	0.947	5.83	0.087	0.925	-0.009	1.153	0.109	-0.224	0.206	0.935
10	5.32	0.105	1.112	5.10	0.106	1.126	0.221	1.400	0.132	-0.040	0.482	0.096
11	5.27	0.101	1.078	5.14	0.102	1.085	0.124	1.310	0.123	-0.120	0.368	0.317
12	5.50	0.114	1.211	5.37	0.116	1.233	0.133	1.221	0.115	-0.095	0.360	0.250
13	5.06	0.141	1.496	5.19	0.108	1.148	-0.133	1.550	0.146	-0.422	0.156	0.365
14	5.85	0.091	0.966	5.86	0.097	1.034	-0.009	1.176	0.111	-0.228	0.210	0.936
15	5.96	0.080	0.855	5.86	0.092	0.981	0.106	1.152	0.108	-0.109	0.321	0.329
16	5.76	0.092	0.975	5.70	0.089	0.944	0.062	1.055	0.099	-0.135	0.259	0.534
17	5.50	0.096	1.019	5.53	0.092	0.983	-0.027	1.184	0.111	-0.247	0.194	0.812
18	5.51	0.083	0.888	5.54	0.088	0.936	-0.027	1.013	0.095	-0.215	0.162	0.781

Table 4. PCFA results of the two rounds data

Intention to settle constructs and manifestations	First round		Second round	
	Factor loading	**Cronbach's alpha**	**Factor loading**	**Cronbach's alpha**
I. Technique-based intention		***0.735***		***0.831***
Preparation		0.622		0.773
1. I allowed adequate time to collect the available information for the negotiation	0.488		0.647	
2. I prepared the claim documents according to the contract requirements	0.829		0.814	
3. I checked the accuracy of the evidence provided by my counterpart	0.788		0.767	
Integration		0.789		0.824
4. I brainstormed settlement options based on the interest of both negotiating parties	0.737		0.739	
5. I tried to understand the perspectives from my counterpart's point of view	0.827		0.795	
6. I suggested integrative solutions to seek the support of my counterpart	0.757		0.762	
II. Relationship-based intention		***0.828***		***0.869***
Goodwill		0.839		0.845
7. I communicated with my counterpart honestly	0.836		0.760	
8. I avoided offensive communication with my counterpart	0.812		0.714	
9. I respectfully listened to my counterpart's grievances	0.697		0.677	
Continuity		0.797		0.849
10. I made concessions to maintain good relationship with my counterpart	0.801		0.530	
11. I was willing to accept short-term losses on the belief that it will be balanced out in the long run	0.714		0.857	
12. I took the long-term relationship and future collaboration with my counterpart into consideration	0.778		0.819	
III. Cognition-based intention		***0.826***		***0.864***
Commitment		0.756		0.772
13. I was willing to spend my leisure time to prepare for or work on the negotiation	0.826		0.858	
14. I had a strong sense of belonging to my project team	0.653		0.553	
15. I believed in the value of remaining loyal to my project team in resolving the dispute	0.686		0.562	
Self-efficacy		0.853		0.910
16. I was confident in my ability to undertake the negotiation effectively	0.748		0.799	
17. I felt I was able to achieve most of our party's goals in the negotiation	0.788		0.846	
18. I felt I could perform quite well even the negotiation was tough	0.816		0.854	

Table 5. Inter-Item Correlation (Round One Survey)

Item	Technique-based intention						Relationship-based intention						Cognition-based intention					
	Preparation			Integration			Goodwill			Continuity			Commitment			Self-efficacy		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1.000	0.402[a]	0.494[a]	0.350[a]	0.302[a]	0.307[a]	—	—	—	—	—	—	—	—	—	—	—	—
2	0.402[a]	1.000	0.543[a]	0.228[b]	0.256[a]	0.204[b]	—	—	—	—	—	—	—	—	—	—	—	—
3	0.494[a]	0.543[a]	1.000	0.265[a]	0.266[a]	0.208[b]	—	—	—	—	—	—	—	—	—	—	—	—
4	0.350[a]	0.228[b]	0.265[a]	1.000	0.525[a]	0.528[a]	—	—	—	—	—	—	—	—	—	—	—	—
5	0.302[a]	0.256[a]	0.266[a]	0.525[a]	1.000	0.660[a]	—	—	—	—	—	—	—	—	—	—	—	—
6	0.307[a]	0.204[b]	0.208[b]	0.528[a]	0.660[a]	1.000	—	—	—	—	—	—	—	—	—	—	—	—
7	—	—	—	—	—	—	1.000	0.648[a]	0.646[a]	0.353[a]	0.332[a]	0.390[a]	—	—	—	—	—	—
8	—	—	—	—	—	—	0.648[a]	1.000	0.624[a]	0.385[a]	0.280[a]	0.368[a]	—	—	—	—	—	—
9	—	—	—	—	—	—	0.646[a]	0.624[a]	1.000	0.408[a]	0.337[a]	0.408[a]	—	—	—	—	—	—
10	—	—	—	—	—	—	0.353[a]	0.385[a]	0.408[a]	1.000	0.562[a]	0.529[a]	—	—	—	—	—	—
11	—	—	—	—	—	—	0.332[a]	0.280[a]	0.337[a]	0.562[a]	1.000	0.546[a]	—	—	—	—	—	—
12	—	—	—	—	—	—	0.390[a]	0.368[a]	0.408[a]	0.529[a]	0.546[a]	1.000	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—	—	—	1.000	0.581[a]	0.450[a]	0.316[a]	0.265[a]	0.250[a]
14	—	—	—	—	—	—	—	—	—	—	—	—	0.581[a]	1.000	0.748[a]	0.557[a]	0.396[a]	0.396[a]
15	—	—	—	—	—	—	—	—	—	—	—	—	0.450[a]	0.748[a]	1.000	0.576[a]	0.406[a]	0.402[a]
16	—	—	—	—	—	—	—	—	—	—	—	—	0.316[a]	0.557[a]	0.576[a]	1.000	0.587[a]	0.670[a]
17	—	—	—	—	—	—	—	—	—	—	—	—	0.265[a]	0.396[a]	0.406[a]	0.587[a]	1.000	0.679[a]
18	—	—	—	—	—	—	—	—	—	—	—	—	0.250[a]	0.396[a]	0.402[a]	0.670[a]	0.679[a]	1.000

[a] Correlation is significant at the 0.01 level (two-tailed);

[b] Correlation is significant at the 0.05 level (two-tailed).

Table 6. Inter-Item Correlation (Round Two Survey)

Item	Technique-based intention						Relationship-based intention						Cognition-based intention					
	Preparation			Integration			Goodwill			Continuity			Commitment			Self-efficacy		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1.000	0.526[a]	0.372[a]	0.404[a]	0.373[a]	0.296[a]	—	—	—	—	—	—	—	—	—	—	—	—
2	0.526[a]	1.000	0.599[a]	0.345[a]	0.269[a]	0.385[a]	—	—	—	—	—	—	—	—	—	—	—	—
3	0.372[a]	0.599[a]	1.000	0.353[a]	0.292[a]	0.318[a]	—	—	—	—	—	—	—	—	—	—	—	—
4	0.404[a]	0.345[a]	0.353[a]	1.000	0.631[a]	0.579[a]	—	—	—	—	—	—	—	—	—	—	—	—
5	0.373[a]	0.269[a]	0.292[a]	0.631[a]	1.000	0.641[a]	—	—	—	—	—	—	—	—	—	—	—	—
6	0.296[a]	0.385[a]	0.318[a]	0.579[a]	0.641[a]	1.000	—	—	—	—	—	—	—	—	—	—	—	—
7	—	—	—	—	—	—	1.000	0.605[a]	0.624[a]	0.470[a]	0.402[a]	0.495[a]	—	—	—	—	—	—
8	—	—	—	—	—	—	0.605[a]	1.000	0.698[a]	0.393[a]	0.443[a]	0.459[a]	—	—	—	—	—	—
9	—	—	—	—	—	—	0.624[a]	0.698[a]	1.000	0.451[a]	0.341[a]	0.482[a]	—	—	—	—	—	—
10	—	—	—	—	—	—	0.470[a]	0.393[a]	0.451[a]	1.000	0.546[a]	0.523[a]	—	—	—	—	—	—
11	—	—	—	—	—	—	0.402[a]	0.443[a]	0.341[a]	0.546[a]	1.000	0.730[a]	—	—	—	—	—	—
12	—	—	—	—	—	—	0.495[a]	0.459[a]	0.482[a]	0.523[a]	0.730[a]	1.000	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—	—	—	1.000	0.397[a]	0.433[a]	0.417[a]	0.433[a]	0.366[a]
14	—	—	—	—	—	—	—	—	—	—	—	—	0.397[a]	1.000	0.697[a]	0.502[a]	0.411[a]	0.446[a]
15	—	—	—	—	—	—	—	—	—	—	—	—	0.433[a]	0.697[a]	1.000	0.584[a]	0.464[a]	0.477[a]
16	—	—	—	—	—	—	—	—	—	—	—	—	0.417[a]	0.502[a]	0.584[a]	1.000	0.815[a]	0.761[a]
17	—	—	—	—	—	—	—	—	—	—	—	—	0.433[a]	0.411[a]	0.464[a]	0.815[a]	1.000	0.788[a]
18	—	—	—	—	—	—	—	—	—	—	—	—	0.366[a]	0.446[a]	0.477[a]	0.761[a]	0.788[a]	1.000

[a] Correlation is significant at the 0.01 level (two-tailed).

Table 7. GOF indices results

		Cross-sectional CFA		Longitudinal CFA			
Fit index	Desired levels	1-round	2-round	Model A	Model B	Model C	Model D
Absolute fit indices							
$\chi 2$/df	2 or below [a, b]	1.686	1.597	1.541	1.530	1.523	1.530
RMSEA	0.08 or below [c]	0.078	0.073	0.070	0.069	0.068	0.069
Incremental fit indices							
CFI	0.8 or above [d]	0.907	0.935	0.873	0.873	0.874	0.872
TLI	0.8 or above [d]	0.887	0.921	0.854	0.857	0.859	0.857
Parsimonious fit							
PNFI	0.5 or above [e]	0.662	0.696	0.623	0.633	0.636	0.636
PCFI	0.5 or above [e]	0.747	0.770	0.761	0.777	0.782	0.783

Notes: [a] Hair et al. (2013); [b] Xiong et al. (2015); [c] McDonald and Ho (2002); [d] Cheung and Li (2019); [e] Chen and Fong (2012)

Table 8. Comparison between Longitudinal CFA Models

Δ Fit index	Model B–Model A	Model C–Model A	Model D–Model A
Δ χ2/df	-0.011	-0.018	-0.011
Δ RMSEA	-0.001	-0.002	-0.001
Δ CFI	0	0.001	-0.001
Δ TLI	0.003	0.005	0.003
Δ PNFI	0.01	0.013	0.013
Δ PCFI	0.016	0.021	0.022

Table 9. ANOVA and LSD posthoc test results for demographical groupings

		Gender		Professions		Years of negotiation experience		Type of organization		Posthoc test
	Constructs	F	p	F	p	F	p	F	P	
1-round	Technique-based	2.513	0.116	1.371	0.249	0.478	0.751	3.085	0.050*	Contractor (6.04) Consultant (5.71)
	Relationship-based	0.172	0.679	1.542	0.195	0.363	0.835	14.570	0.000***	Contractor (5.85) Owner (5.53) Consultant (4.93)
	Cognition-based	0.033	0.856	1.972	0.104	0.583	0.675	10.459	0.000***	Contractor (5.89) Owner (5.41) Consultant (5.08)
2-round	Technique-based	0.724	0.397	2.034	0.095	0.410	0.801	3.339	0.039*	Contractor (6.06) Consultant (5.61)
	Relationship-based	0.429	0.514	0.834	0.507	0.342	0.849	3.997	0.021*	Contractor (5.75) Consultant (5.27)
	Cognition-based	3.241	0.075	3.500	0.010*	0.639	0.635	5.546	0.005**	Contractor (5.81) Consultant (5.23)

Note: * significant at the 0.05 level; ** significant at the 0.01 level; *** significant at the 0.001 level.

Table 10. Profile of experts

Person	Years of experience	The majority of negotiations involved	Countries of practice
Owner A	> 20 years	Building work, civil engineering work, and maintenance work	HK
Owner B	> 10 years	Building work	HK, Macau
Contractor A	> 30 years	Civil engineering work	HK, Mainland China
Contractor B	> 15 years	Building work and civil engineering work	HK, Mainland China
Contractor C	> 10 years	Building work	HK, Mainland China
Consulting engineer	> 10 years	Building work and civil engineering work	HK