Minimising Biases in Construction Dispute Negotiation

Keyao Li and Sai On Cheung

Introduction

The happenings of biases in construction dispute negotiation have been reported to be real in Chapter "The Happening of Bias in Construction Dispute Negotiation". The sources of biases have been unveiled through conceptualizing biased behaviors (Chapter "Conceptualising Bias in Construction Dispute Negotiation"). The study on biases in CDN is further enhanced with the development of a detection tool (Chapter "A Bias Detection Tool for Construction Dispute Negotiation"). Endowment and Reactive Devaluation as special forms of bias are discussed in Chapter "Special Forms of Bias: Endowment Effect and Reactive Devaluation". This chapter looks into approaches and measures to minimize the happening and effect of biases. As it is not easy for dispute negotiators to admit having biases, this study canvassed the expert knowledge of practicing dispute resolution third-party neutrals instead. In Hong Kong, mediation is the most commonly used alternative dispute resolution for construction disputes. A mediator facilitates the dispute negotiation and hence mediation is also called assisted negotiation. This chapter first presents an overview of construction mediation in Hong Kong then followed by a study of the usefulness of bias minimizing approaches and measures.

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Overview of Mediation Development in Hong Kong Construction Industry

Resolving dispute through arbitration and litigation is costly and lengthy. Mediation is the most widely used alternative dispute resolution (ADR) process to resolve construction dispute in Hong Kong. Essentially, voluntary use of mediation has been specified in construction conditions of contracts in Hong Kong since 1999. Voluntary use of mediation was promoted by the Government of the Hong Kong Special Administrative Region by incorporating it in the Government Standard Forms of Contract for in 1999. Voluntary mediation has reached new heights with the Civil Justice Reform (CJR hereafter) came into effect in 2009. Under the CJR, disputants of civil cases, including construction, are encouraged to attempt mediation before trial.

Specifically for construction cases reaching the Hong Kong High Court Arbitration and Construction List, Practice Direction 6.1 (PD 6.1 hereafter) that was released in April 2009 will apply. Under PD 6.1, where a party wishes to adopt mediation, he or she can do so by serving a Mediation Notice upon the other party and file the copy with the Court. Upon receiving the Mediation Notice, the other party should respond in writing within 14 days stating whether s/he is willing to mediate, whether he or she agrees to the rules identified, whether s/he agrees with the proposed timetable and minimum amount of participation. If s/he refuses to mediate, s/he would have to state the reasons. Even if no party requests mediation at the proceeding, the Court may ask the parties whether they have attempted mediation. Cost sanction is used to deter unreasonable refusal to mediate. Thus, the use of mediation has been boosted indirectly by discouraging "unreasonable refusal to mediate" and "failing to attempt to mediate" [17, 47].

After the Civil Justice Reform came into effect, in 2012 the Hong Kong Mediation Accreditation Association Limited (HKMAAL) was established to provide mediation training. Furthermore, Mediation Ordinance (Laws of Hong Kong CAP 620) was enacted and came into effect in 2013. CAP 620 provides the vital legal backing on mediation practice and most significantly the confidentiality of the mediation communications. It can thus be said that the mediation landscape in Hong Kong has undergone some fundamental changes as a result of the CJR.

Research Design of the Study

To examine bias minimizing strategies in construction dispute negotiations, literature on bias minimizing approaches was first reviewed. Bias minimizing measures were then operationalized in the context of construction dispute negotiation. Third party neutrals who are members of the Hong Kong Society of Construction Law was approached for their assessment on the usefulness of the measures. In view of the non-discrete nature of usefulness evaluation, fuzzy sets based linguistic evaluations were

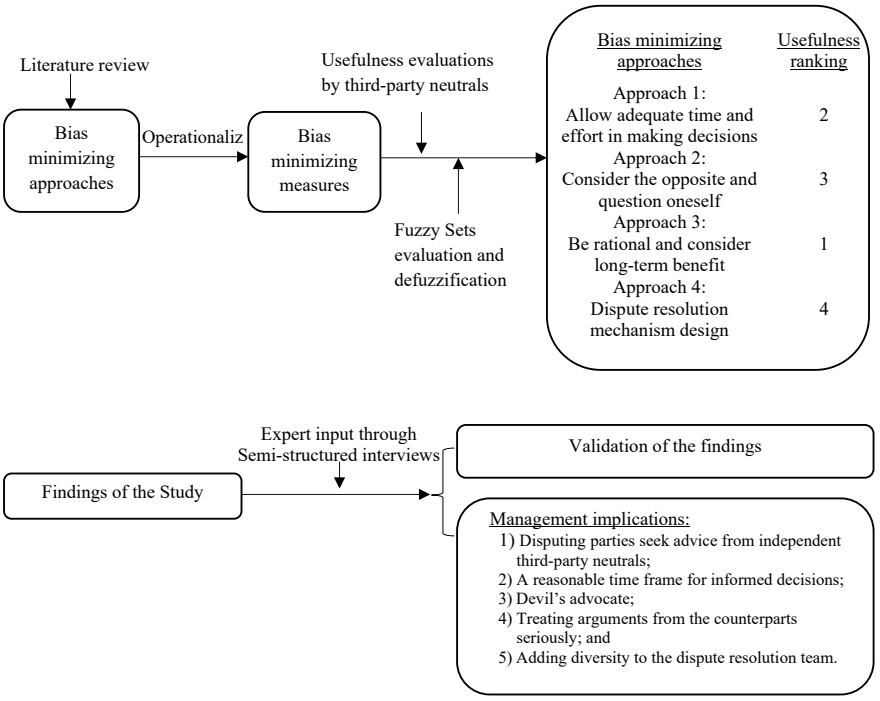

Fig. 1 Research design

used. Rankings of usefulness were calculated from the data collected. Further details in this regard are given in the data collection section. Semi-structured interviews were conducted to validate the findings. Figure 1 gives the research tasks involved and the major findings of the study.

Bias Minimizing Approaches

The following bias minimizing approaches are developed through a review of literature on biases minimizing and avoiding.

Allow Adequate Time and Effort in Making Decisions

Optimal decisions are not commonly made due to time pressure or insufficient analysis [15, 23, 57]. In construction dispute negotiation, similar situation happens when disputing parties opt for a quick and early decision [20]. This not desirable. Instead,

even when the disputing parties are facing the pressure of ambitious offers and challenges, duly and comprehensively assessing the information provided by the counterpart should be practiced [20, 27]. For example, adequate time should be allowed to consider alternative scenarios as and when new information become available [2, 9, 31, 33]. Understanding the perspectives and interests of the counterpart might help to identify blind spot one might have missed [25, 27].

Consider the Opposite and Question Oneself

"Consider-the-opposite" has been put forward by many researchers as a useful way to guard against casting narrow view of the evidence [3, 20, 51, 58]. It is suggested that during CDN, disputing parties should not restrict themselves to search for evidence and information that support their view of the dispute. Instead, a more open attitude should be adopted so that other options and alternatives can be evaluated. Information that runs against one's assessment can be useful as more options are considered [27, 43, 63]. Arguments that work against one's initial judgment could offer different perspectives [46, 58]. Undoubtedly, questioning the soundness and currency of the already-formed assessments is a useful approach [23, 35, 41, 42]. By the same token, careful consideration of reasoning of the counterpart's assessments would prompt new ideas and break overconfidence effect of the decision makers [7, 42, 46, 58]. Applying reality testing with the assistance of professional third-party neutrals would also keep the disputing parties' expectations more sensible [1, 44].

Be Rational and Consider Long-Term Benefit

Avoiding negative emotion is useful to minimize the influence of cognitive biases [6, 25, 26, 32, 64]. Trying to understand the standpoints of the counterparts is useful to counter the happening of anchoring and self-serving effects [5, 28, 29, 31]. Extreme behaviors can be suppressed when relationship breakdown is to be avoided [6, 65, 68]. Baron [6] and Thompson and Lucas [70] further suggested that collegial atmosphere is conducive for achieving win–win solutions. To avoid interest-oriented bias, disputing parties should prioritize mutual benefit over one's demand [8, 22, 25, 50]. Being rational and paying attention to the possible failure to settle could alleviate unjustified optimism [3, 34, 62]. To reduce self-serving bias, means should be derived to make everyone's responsibilities apparent especially the accountability for failing to reach a settlement [46, 68, 71]. Lyons [52] and Fisher et al. [25] suggested open communication to cultivate win–win negotiation.

Dispute Resolution Mechanism Design

Multi-tiered dispute resolution (MTDR) process incorporating alternative dispute resolution (ADR) is the prevailing contractual arrangement for construction dispute resolution [48]. Under MTDR arrangement, a dispute may undergo several rounds of resolution unless an early settlement is achieved [50]. Repeated dispute evaluations are conducive for bias like anchoring and self-serving. Thus, bias minimizing measures should be embedded in the MTDR arrangements. Soll et al. [68] echoed this and advocated that de-biasing measures should be an integral part of the resolution process. Nonetheless, this cannot replace addressing the source, de-biasing should be included as part of dispute resolution study and training [3, 20, 24, 46, 56]. Proper training shall equip decision makers with sufficient awareness to avoid contracting any form of bias avoiding [46, 70]. Croskerry et al. [20] further stated that pre-resolution would make decision maker mindful of the detriments that biases can bring about. In this regard, it would be good practice to ask disputing parties to review their interests and prior decisions before commencing a new tier of resolution [4]. Self-reflection would encourage rethinking of alternative options that would preserve their demand as well as satisfying those of the counterpart [25]. At organizational level, introducing new team members or changing the negotiators in charge may also bring new perspectives and ideas [13, 46].

The afore-stated four types of approach to minimize cognitive bias as summarized from relevant literature should be applicable to CDN. For this purpose, the four approaches were operationalized into twenty bias minimizing measures in CDN context. The bias minimizing measures and their respective theoretical bases are listed in Table 1. The effectiveness of these bias-minimizing measures was evaluated by experienced third-party neutrals.

Usefulness of the Bias Mitigating Approaches

The usefulness of the afore-mentioned bias minimizing measures (Table 1) was evaluated by third party neutrals through a data collection form. Each data set includes some basic information such as the role of the respondent, years of experience practicing CDN, the majority of dispute type involved and the most common causes of disputes.

The respondents were practicing third-party neutrals including accredited mediators, arbitrators and adjudicators. They were members of the Society of Construction Law Hong Kong (SCLHK), the Hong Kong International Arbitration Centre (HKIAC), the Hong Kong Mediation Accreditation Association Limited (HKMAAL), the Hong Kong Institute of Arbitrators (HKIAB) and the Hong Kong Institution of Engineers (HKIE). 66 valid responses were finally obtained with 600 distributed. Among the respondents, 76% have more than 15 years in CDN. In fact, nearly 60% of respondents have practiced in construction dispute resolution for more

Table 1 Bias minimizing approaches and measures

	Bias minimizing approaches and measures	References
Approach 1: Allow adequate time and effort in making decisions		
Measures	(1) Disputants should avoid premature closure of thinking by allowing adequate time for decision-making	[15, 20, 23, 57]
	(2) Disputants should carefully re-estimate the case and reservation price of the counterpart when given ambitious offers	[20, 27]
	(3) Disputants should check the accuracy of the evidences provided by the counterpart	[20, 27]
	(4) Disputants should delay forming an assessment until all the available information is considered	[25, 27]
	(5) Disputants should be open to other alternatives even after a first assessment about the dispute has been formed	[2, 9, 31, 33]
Approach 2: Consider the opposite and question oneself		
Measures	(6) Disputants should search for and consider information against the previously formed assessment	[27, 43, 63]
	(7) Disputants should question the soundness of the previously formed assessments routinely	[23, 35, 41, 42]
	(8) Disputants should list reasons why the assessment of their counterpart can hold	[7, 42, 46, 58]
	(9) Disputants should ask for feedbacks and assistance from the third-party neutrals	[1, 44]
Approach 3: Be rational and consider long-term benefit		
Measures	(10) Disputants should consider mutually beneficial trade-offs between the parties	[8, 22, 25, 50, 52],
	(11) Disputants should try not to be emotional	[6, 25, 26, 32, 64]

(continued)

Table 1 (continued)

	Bias minimizing approaches and measures	References
	(12) Disputants should play the role of their counterpart to understand his position	[5, 28, 29, 31]
	(13) Disputants should respectfully listen to their counterpart's grievances	[5, 28, 29, 31]
	(14) Disputants should consider maintaining relationships and future collaboration with their counterpart	[6, 65, 68, 70]
	(15) Disputants should consider the chance of settlement failure	[3, 34, 46, 62]
	(16) Disputants should think about their own responsibilities when settlement fails	[68, 71]
Approach 4: Dispute resolution mechanism design		
Measures	(17) Disputants should receive de-biasing training and education before entering resolution processes	[3, 20, 24, 46, 56, 70]
	(18) New members in the resolution team are required to start a new round of resolution	[13, 46]
	(19) Re-assessment and reconstruction of the decisions are required to start a new round of resolution	[4, 25]
	(20) A process of reviewing initial needs is required in each round of resolution	[4, 25]

than 20 years (Figs. 2 and 3 refer). Dispute types and causes of the dispute that the respondents are involved are presented in Table 2. The disputes are mainly handled in building (superstructure) work and civil engineering work (Table 2) and the mostly happened cause of dispute is incomplete contract.

Data Analyses and Findings

The usefulness evaluation is not suitable for discrete measures because of the subjective nature. To minimize the potential distortion, fuzzy sets based linguistic evaluations were used [67, 73]. Fuzzy linguistic terms "Useless", "Weakly Useful",

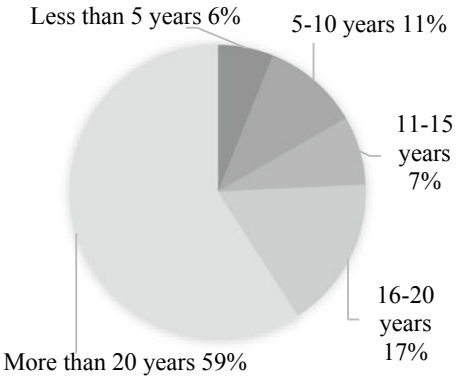

Fig. 2 Years of experience of the respondents

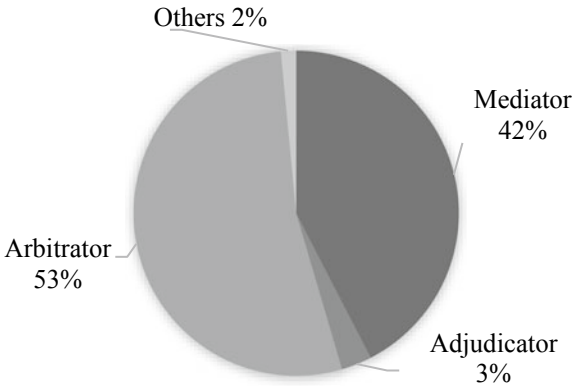

Fig. 3 Roles of the respondents

Table 2 Types and causes of the dispute

Disputes type	Percentage (%)	Cause of the disputes	Percentage (%)
Building services installations	4.5	Risk uncertainty	7.6
Building (foundation) work	7.6	Collaboration among the parties	19.7
Building (superstructure) Work	36.4	Contract incompleteness	42.4
Civil engineering work	39.4	Opportunistic behavior	12.1
Maintenance work	9.1	Affective conflict	1.5
Others	3.0	Others	16.7
Total	100	Total	100

Table 3 Linguistic variables in triangular membership functions

Linguistic variables	Fuzzy number (a, b, c)
Useless	(0.00, 0.10, 0.30)
Weakly useful	(0.00, 0.20, 0.40)
Slightly useful	(0.20, 0.35, 0.50)
Useful	(0.30, 0.50, 0.70)
Moderately useful	(0.50, 0.65, 0.80)
Very useful	(0.60, 0.80, 1.00)
Absolutely useful	(0.70, 0.90, 1.00)

"Slightly Useful", "Useful", "Moderately Useful", "Very Useful" and "Absolutely Useful" were employed to represent the usefulness of the listed bias minimizing measures. Triangular membership functions were chosen for relative ease of mathematical treatment. The pre-defined fuzzy linguistic frequency groups and the triangular membership functions and linguistic variables of usefulness are presented in Table 3 [37, 74]. The graphical representation of the fuzzy numbers is shown in Fig. 4.

For the ith bias minimizing suggestion, aggregation on fuzzy numbers are worked out as per Eqs. 1, 2 and 3 from [19]:

$$\tilde{A}_{\mathrm{i}} = \left(\frac{1}{p}\right) \otimes (\tilde{a}_1 \oplus \tilde{a}_2 \oplus \tilde{a}_3 \oplus \cdots \oplus \tilde{a}_{\mathrm{p}}) \tag{1}$$

$$\tilde{B}_{\mathrm{i}} = \left(\frac{1}{p}\right) \otimes (\tilde{b}_1 \oplus \tilde{b}_2 \oplus \tilde{b}_3 \oplus \cdots \oplus \tilde{b}_{\mathrm{p}}) \tag{2}$$

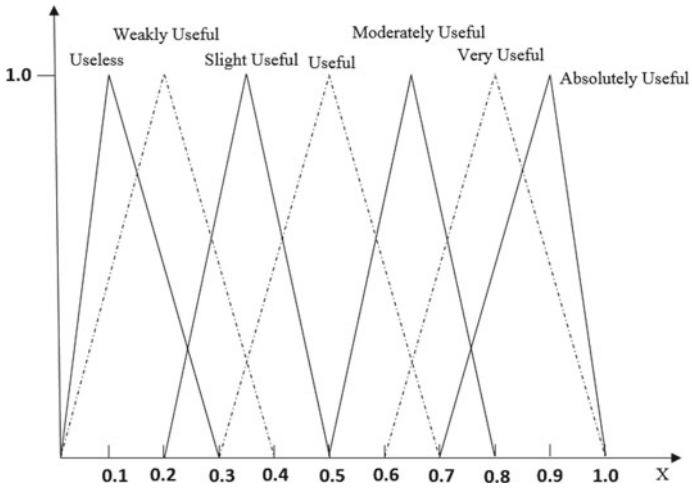

Fig. 4 Graphical representation of fuzzy sets based linguistic evaluation

$$\tilde{C}_i = \left(\frac{1}{p}\right) \otimes (\tilde{c}_1 \oplus \tilde{c}_2 \oplus \tilde{c}_3 \oplus \cdots \oplus \tilde{c}_p) \tag{3}$$

where $\tilde{a}$ is first fuzzy parameter of selected linguistic variable; $\tilde{b}$ is second fuzzy parameter of selected linguistic variable; $\tilde{c}$ is third fuzzy parameter of selected linguistic variable; and p = number of respondents.

Defuzzification was then conducted to interpret the membership into a non-fuzzy value to express the "expected" value of the fuzzy number [66]. The "expected value" makes it easier to rank and compare the fuzzy numbers. Triangular fuzzy number was defuzzified using Eq. 4 [67]:

$$e_i = (\tilde{A}_i + 2\tilde{B}_i + \tilde{C}_i)/4 \tag{4}$$

where $\tilde{A}_i$, $\tilde{B}_i$ and $\tilde{C}_i$ are aggregated fuzzy parameters.

The aggregated fuzzy parameters and defuzzified values of the twenty bias minimizing measures are represented in Table 4. For comparison reason, all the defuzzified values were kept to four decimal places. It can be seen in Table 4 that, except item 18, all the listed measures have defuzzified values larger than 0.5. In fact, measures 1–16 have defuzzified values larger than 0.6. Therefore, the bias minimizing measures collected from literature were evaluated to be useful by the third-party neutrals. Among the four types of bias minimizing approach, being rational and consider long-term benefit ranks the highest with a defuzzified value of 0.7075 (Table 4). Hence, third-party neutral respondents believe that being rational and consider long-term benefit is an effective way for disputing parties to minimize the influence of bias. Allowing adequate time and effort in making decisions was ranked the 2nd most useful with a defuzzified value of 0.6868. Consider the opposite and question oneself was the 3rd useful with a defuzzified value of 0.6756 and dispute resolution mechanism ranks the lowest among the four and the defuzzified value is 0.5474.

Validation of the Findings

Semi-structured interviews with ten expert third-party neutral were conducted to validate the findings. The profiles of the interviewees are summarized in Table 5.

On the Practice of Biased Behaviors

All the interviewees confirmed the happening of biases in the cases they handled and believe that bias minimizing measures listed in Table 4 can be useful. First, controlling emotions would help in curbing irrational assessments. "Emotion controlling is tricky as the burst of emotion can come spontaneously", said by one interviewee. The

Table 4 Usefulness of bias minimizing approaches and measures

Bias minimizing approaches and measures	Aggregated fuzzy parameters	Defuzzified value	Ranking of approach
Approach 1: Allow adequate time and effort in making decisions	(0.50, 0.69, 0.86)	0.6868	2
Disputants should avoid premature closure of thinking by allowing adequate time for decision-making	(0.50, 0.69, 0.86)	0.6830**	
Disputants should carefully re-estimate the case and reservation price of the counterpart when given ambitious offers	(0.45, 0.64, 0.81)	0.6352**	
Disputants should check the accuracy of the evidence provided by the counterpart	(0.55, 0.75, 0.91)	0.7386**	
Disputants should delay forming an assessment until all the available information is considered	(0.47, 0.66, 0.83)	0.6534**	
Disputants should be open to other alternatives even after a first assessment about the dispute has been formed	(0.54, 0.73, 0.90)	0.7239**	
Approach 2: Consider the opposite and question oneself	(0.49, 0.68, 0.85)	0.6756	3
Disputants should search for and consider information against the early formed assessment	(0.48, 0.67, 0.85)	0.6682**	
Disputants should question the soundness of the previously formed assessments routinely	(0.49, 0.68, 0.85)	0.6784**	
Disputants should list reasons why the assessment of their counterpart can hold	(0.53, 0.72, 0.89)	0.7136**	
Disputants should ask for feedbacks and assistance from the third-party neutrals	(0.46, 0.65, 0.82)	0.6420**	

(continued)

Table 4 (continued)

Bias minimizing approaches and measures	Aggregated fuzzy parameters	Defuzzified value	Ranking of approach
Approach 3: Be rational and consider long-term benefit	(0.52, 0.71, 0.88)	0.7075	1
Disputants should consider mutually beneficial trade-offs between the parties	(0.55, 0.74, 0.91)	0.7318**	
Disputants should try not to be emotional	(0.56, 0.76, 0.91)	0.7455**	
Disputants should play the role of their counterpart to understand his position	(0.53, 0.72, 0.89)	0.7170**	
Disputants should respectfully listen to their counterpart's grievances	(0.52, 0.71, 0.88)	0.7091**	
Disputants should consider long-term relationships and future collaboration with their counterpart	(0.50, 0.68, 0.85)	0.6773**	
Disputants should consider the chance of settlement failure	(0.51, 0.70, 0.88)	0.7000**	
Disputants should think about their own responsibilities when settlement fails	(0.49, 0.67, 0.85)	0.6716**	
Approach 4: Dispute resolution mechanism design	(0.37, 0.55, 0.73)	0.5475	4
Disputants should receive debiasing training and education before entering resolution processes	(0.38, 0.56, 0.73)	0.5580*	
New members in the resolution team are required to start a new round of resolution	(0.29, 0.46, 0.64)	0.4648	
Re-assessment and reconstruction of the decisions are required to start a new round of resolution	(0.39, 0.58, 0.76)	0.5761*	

(continued)

Table 4 (continued)

Bias minimizing approaches and measures	Aggregated fuzzy parameters	Defuzzified value	Ranking of approach
A process of reviewing initial needs is required in each round of resolution	(0.41, 0.59, 0.77)	0.5909*	

* Defuzzified value above 0.5. **Defuzzified value above 0.6

Table 5 Profiles of the interviewees

Person	Years of experience	Primary role as third-party neutral	The majority of disputes involved	Countries of practice
No. 1	More than 30 years	Mediator	Civil engineering works	UK, HK
No. 2	More than 30 years	Arbitrator	Building works	HK
No. 3	More than 20 years	Expert witness and representative	Civil engineering works	HK
No. 4	More than 40 years	Mediator and arbitrator	Building works	HK, Mainland China
No. 5	More than 60 years	Arbitrator and mediator and adjudicator and consulting engineer	Building works and civil engineering works	UK
No. 6	More than 20 years	Mediator and arbitrator	Building works	UK, US, HK
No. 7	More than 45 years	Mediator and adjudicator and expert witness and dispute resolution advisor	Building works	UK, HK
No. 8	More than 20 years	Arbitrator and in-house expert	Civil engineering works	HK, Macau
No. 9	More than 20 years	Mediator	Civil engineering works	HK
No. 10	More than 30 years	Arbitrator	Civil engineering works	HK, UK

interviewees also thought that disputing parties having emotion would miss important and critical details and their decisions were therefore suboptimal. Reality checks were suggested by the interviewees as useful tactics that they often use to help disputing parties to stay away from unnecessary emotional reactions. “When the disputing parties were reminded about long-term benefits and company reputation, they could better control their emotions and behave more appropriately”, raised by a mediator.

Besides, allowing enough time for disputing parties to review the dispute would improve the chance of coming up with more considerate decisions. One interviewee

who has practiced both mediation and arbitration for more than 40 years said: "A cooling-off period is instrumental for heated disputing parties to remain in rational course and consider carefully the information from both sides". It is not standard practice for dispute negotiators to estimate both the accuracy of information provided by their own team and those presented by the counterpart. Objective assessments would only be obtained with comprehensive information and a holistic view of the dispute from both sides' perspective. The interviewees also agreed that dispute negotiators should be critical towards their reasoning to keep themselves distance from preconception bias. From a broader perspective, dispute resolution training and process design can play a part to guard against cognitive bias although this is not often taken on broad. An arbitrator commented that: "Education and training would be helpful if they could keep the disputing parties mindful of the biases". He further suggested that: "Having arrangements to remind disputing parties of their real needs would be helpful".

Suggestions from the Interviewees

Humans are reluctant to admit that their decisions can be influenced by biases or in fact are biased. Construction dispute negotiators are human. Nonetheless, biased behaviors had been observed by third-party neutrals who also concurred that biases were detrimental to rational construction dispute resolution and made settlement more difficult. Minimizing the happening of and effect of biases through appropriate means should be integral part of construction dispute management.

First, the interviewees emphasized they could offer advice or assistance from independent third-party neutrals. The respondents of this study are quite adamant that they can offer professional advice in helping disputing parties to evaluate their cases objectively, review their assessments to determine realistic expectations. Second, the interviewees pointed out that reasonable time frame should be allowed for negotiators to make informed decisions. While, timely but not hastily decisions are welcome, adequate time for reasonable research on both their own and the counterparts' requests should be allowed. Disputing parties should review the options available with an open mind whenever new information becomes available. Moreover, this does not mean allowing protracted decisions. Where appropriate, momentum can be maintained through the expert input of third-party neutrals. Procrastination is sign of failure. Third, introducing a devil's advocate in dispute evaluation can improve objectivity of the assessments. It should also be coupled with mandatory review of different perspectives. Ideally, the devil's advocate should be someone who has not been involved in the dispute. He should be allowed complete freedom to raise different views on the line taken, challenge the validity of the evidence as well as the logic of the arguments. Fourth, arguments given by the counterparts should be treated seriously. It may be worthwhile to require certain time must be devoted to considering arguments presented by the counterparts. Fifth, adding diversity to the dispute resolution team can also be affected through having team members having

different professional background and experience. For dispute involving international disputing parties, nationality and cultural background should also be taken into account. Sixth, senior management should be involved as early as possible. As they are not those directly involved in the dispute, the chance of being emotional and perceptive would be less. It is believed that, with the collaboration of third-party neutrals and disputing parties, the potency of cognitive biases would be minimized, and the efficiency of construction dispute management would be enhanced.

Follow Up on the Suggestion of the Third-Party Neutrals

In Hong Kong, mediation is by far the most widely used alternative dispute resolution (ADR) method to resolve construction disputes [18, 12, 30, 60, 69]. Mediators are neutral third parties who facilitate settlement of dispute [47, 55]. Mediators seek to reconcile the concerns of the disputing parties so that common grounds can be identified [25, 39, 59]. With the help of professional mediators, the chance of reaching successful settlement would be improved. As dispute facilitator, a mediator would also be instrumental in helping disputing parties to stay away from biases. This part of the study aims to incorporate de-biasing arrangements in the mediators' toolkit. A review of the development history of mediation in Hong Kong is first outlined. The mediation rules commonly used in Hong Kong are examined to understand whether sufficient provisions have been included or can be used to guard against biases. As reality testing is the most instrumental tactics that mediators use to facilitate dispute negotiation, the potential of using reality testing to minimize biases is examined in detail.

Insights from Mediation Rules

In Hong Kong, most construction related learned societies are offering dispute resolution services with respective rules and regulations. These rules aim to ensure fair procedures that conform to legal requirements. Two mediation rules for construction disputes that are commonly used in Hong Kong are: the Hong Kong Special Administrative Region Construction Mediation Rules (1999 Edition) (the HKSARCM Rules 1999 hereafter) and the Hong Kong Construction Arbitration Centre Construction Mediation Rules 2015 (the HKCACCM Rules 2015 hereafter). The next section outlines the de-biasing arrangements, if any.

The two mediation rules were reviewed article by article. Both mediation rules have detailed the procedures on initiating and terminating mediation, selection of mediators, confidentiality as well as costs of mediations. The rules also stipulate that mediators should not have pecuniary or proprietary interest in relation to the mediation. For the disputing parties, both of the two mediation rules encouraged good faith and co-operation. Both rules also restrict the same mediator to be appointed

as arbitrator or representative or counsel in any of the subsequent dispute resolution processes. It is believed that if the same mediator is appointed in the subsequent proceedings, his views of the dispute formed during the mediation may influence his assessment in subsequent proceedings. This provision can serve to guard against preconception bias of the mediator. The details of the bias avoidance arrangements in these two rules are summarized in Table 6. These rules basically aim to address procedural injustice and opportunism. Moreover, during mediation it is possible that disputing parties may be influenced by biases that would lead to irrational decisions and suboptimal assessments. Unfortunately, measures against disputing parties' biases cannot be traced in the mediation rules. Formalized bias avoidance arrangements are therefore insufficient.

Embracing De-biasing in Reality Testing

In the absence of formalized bias avoidance arrangements incorporated in the mediation rules, attention is now turned to the toolkits of the mediators. As suggested by one of the interviewees, the tactic of realty testing can be instrumental in addressing biases. Reality testing is a tactic of mediator, which stimulates the disputing parties to review and re-estimate their decision-making process so as to improve the quality of their decisions [47, 53, 54, 61, 72]. Reality testing involves tactfully asking the disputing parties questions about their opinions to the issues in dispute, their expectations of the resolution, their assessments of the case, their attitude and feelings, etc. [16, 21, 36, 40, 45, 47]. To properly ask these questions, disputing parties need to review their decisions including the assumptions and the process. This accords a renewed opportunity for the disputing parties to unveil any mistakes, misinterpretation and of course effects of biases on their decisions. In view of the versatility of the tactic of reality testing, this part of the study focuses on incorporating de-biasing elements into the tactic of reality testing.

Using Reality Testing to De-bias Disputing Parties' Decision-Making Strategies

It is useful to remind the disputing parties about the potential sources of bias. Disputants have the tendency to rely too much on their first formed assessment. They often found their first assessment satisfying and would not take further effort to review the assumptions and logics again [10, 14, 48]. When a mediator triggers reality testing, the disputing parties are more likely to revisit their assessments. Allowing reasonable time for the disputing parties to carry out the necessary research could avoid mistakes due to rushing decisions and reduce the preconception bias [9, 25, 27]. When challenged by reality testing, a sensible disputing party would seek more

Table 6 Potential bias minimizing provisions in the HKSARCM Rules 1999 and the HKCACCM Rules 2015

Mediation rules	Bias minimizing arrangements			
	Prerequisites of the mediator	Role of the mediator	Role of the parties	Mediator's role in subsequent proceedings
HKSARCM Rules 1999 (Pre-Civil Justice Reform)	• The mediator shall not have any financial or personal interest in the outcome of the mediation • The mediator shall disclose any circumstances likely to create a presumption of bias or prevent a prompt resolution of the dispute	• The mediator may conduct the mediation in such manner as he considers appropriate, taking into account the circumstances of the case, the wishes of the parties and the need for a speedy settlement of the dispute. The mediator may communicate with the parties together or with each party separately	• Each party shall co-operate in good faith with the mediator. Either party may request a private meeting with the mediator at any time	• The parties undertake that the mediator shall not be appointed as arbitrator or representative or counsel of either party in any subsequent arbitration or judicial proceedings whether arising out of the mediation or any other dispute in connection with the same contract

(continued)

Table 6 (continued)

Mediation rules	Bias minimizing arrangements			
	Prerequisites of the mediator	Role of the mediator	Role of the parties	Mediator's role in subsequent proceedings
HKCACCM Rules 2015 (Post- Civil Justice Reform)	• The mediator shall not have any financial or personal interest in the result of the mediation • The mediator shall disclose any circumstances likely to create a presumption of bias or prevent a prompt and properly procured settlement of the dispute	• The mediator may conduct the mediation in such manner as he considers appropriate, taking into account the special and technical circumstances of the case, the wishes of the parties, and the need for a speedy settlement of the dispute without unnecessary cost • The mediator shall conduct the Mediation appropriate to the nature of the dispute and the needs of the parties	• Each party shall co-operate with the Mediator and act in good faith to resolve the dispute • A party may request a private meeting with the Mediator at any time. The parties shall give full assistance to enable the Mediation to proceed and be concluded within the time stipulated	• No party shall appoint the Mediator as an adjudicator, representative, counsel or expert witness of any party in any subsequent adjudication or judicial proceedings arising out of the Mediation

information to study his prior assessment. When being asked about their reactions of receiving ambitious offer from the counterpart, disputing parties would be reminded and suggested to re-estimate the case and the reservation price of the counterpart, which are the measures that could reduce the influence of preconception resulted from the ambitious offer from the counterpart [20, 27, 49]. Moreover, when being asked about the supporting information of the counterpart, disputing parties have to evaluate the case from the perspective of their counterpart. Paying attention to the evidence and assessments from the opposite side becomes a good way to identify one's own blind spots that would in turn alleviate the impact of self-affirmation bias [3, 20, 51, 58].

Using Reality Testing to De-bias Disputing Parties' Attitudes

Emotion control is one of the most effective means to eliminate biases [25, 26, 32, 38]. Reality testing could help the disputing parties to recognize their behavioral shortcomings [11, 16, 47, 61]. Adjusting the demands and expectations through logrolling would cut off the sources of optimism and interested-oriented biases [8, 22, 65, 68]. When being asked to stand in the roles of their counterpart, the disputing parties would develop empathy and understand better the situation of their counterpart. The important thing is to listen carefully the counterpart's deliberation. Deeper mutual understanding curbs selfish interest-maximizing [28, 29, 31]. When being asked about the manners to be adopted if collaboration is desired, one could realize insisting on self-interest is not conducive to resolve the dispute. Furthermore, warm reminder of the consequences of failing to reach a settlement in tangible terms like legal costs and unproductive use of scare resources would help overcoming overconfidence and optimistic biases [62, 65].

Using Reality Testing to De-bias the Mechanism of Mediation

Reality testing could be employed to optimize mediation mechanism. By reality testing, mediator would ask the disputing parties to consider the advantages of including new members with fresh ideas in the mediation process. The mediator would ask whether the disputing parties would opt for a new caucus to consider re-assessment and reconstruction of their positions. By asking the advantages of these processes, mediator is actually suggesting these ways to optimize the mediation mechanism. By including these helpful processes into mediation, disputing parties' biased assessments could receive reasonable questioning, if met with appropriate responses, self-defending would be reduced [4, 13, 25, 46]. Besides, by asking about the initial needs of the disputing parties, disputing parties would have their initial needs reviewed. With the help of mediator, disputing parties would separate their currently held position with their initial needs and develop alternative feasibility [47,

53]. By conducing reality testing about the mediation process, experienced mediator would provide their suggestions on optimizing the mechanism, through which preconception bias and interest-oriented bias would be reduced.

Reality testing has no specific question styles. The proposed reality testing questions are suggestions and can be modified to suit the contexts. Mediators can use these questions to help disputing parties self-realize and correct their biased behaviors. The reality testing questions developed in this study and their respective theoretical bases are listed in Table 7.

Views from the Experts

The validity and practicality of the reality testing questions proposed were verified in this section of the study. The questions were arranged in a questionnaire survey and were distributed to experienced third-party neutrals who had participated in the validation of the bias minimizing measures. These experts have at least twenty years' experience in construction dispute resolution. They were asked to rate on the usefulness of these reality testing questions based on a 7-point Likert scale from "1 = Not at all" to "7 = Absolutely useful". The experts' ratings on the usefulness score and usefulness ranking of these reality testing questions are shown in Table 7. The profile of the experts is shown in Table 8.

It can be seen in Table 7 that all these reality testing questions have usefulness scores larger that mid-point (3.5) of the usefulness scale. Almost all these reality testing questions have usefulness score larger than 4.0, except Question 4 "Are the current set of assumptions exhaustive?" with the usefulness score of 3.9. Therefore, the experienced construction dispute resolution experts validated the usefulness of these questions. Among these questions, Question 6, Question 17 and Question 5 were ranked the top three most useful. Hence, reminding the disputing parties to assess the case from the opposite side and exhaust alternative positions to achieve initial needs have been pinpointed as the most instrumental.

Generally speaking, strategy-related questions were rated highly. The respondents considered that through reminding the disputants to re-think and re-examine their cases from an opposite perspective could address the primary sources of bias. Attitude-related questions were ranked the second most useful. Keeping the disputing parties focus on the mutual beneficial trade-offs and future collaboration were useful to overcome overconfidence effect. Controlling emotion is also important but has to be exercised tactfully and skillfully simply because very few people are willing to accept that they are having emotion. Process-related questions seek to remind disputing parties to search for alternative positions to achieve their initial needs. These are rated as the third most useful. Mediators suggesting a review of the case is considered a good practice whenever appropriate and particularly at each round of negotiation. Having new members should not be neglected in particular when new information becomes available.

Table 7 Reality testing questions

References	Reality testing questions	Purpose of the questions	Usefulness score	Usefulness ranking
Questions about decision making strategies			*5.0*	*(1)*
[9, 25, 27]	Question 1: "Do you think you need more time to come up with an assessment?"	A	4.8	8
[20, 27, 49]	Question 2: "Have you re-examined your case upon receipt of an offer from your counterpart?"	A	5.3	6
[9, 25, 27]	Question 3: "Have you considered all the available information in deriving your current assessment?"	A, B	4.6	9
[9, 25, 27]	Question 4: "Are the current set of assumptions exhaustive?"	A, B	3.9	17
[3, 20, 51, 58]	Question 5: "Have you considered information that runs against your assumptions of the case?"	B	5.5	3
[3, 20, 51, 58]	Question 6: "Are there any facts that support your counterpart?"	B	5.9	1
Questions about attitude during mediation			*4.7*	*(2)*
[8, 22, 25, 65]	Question 7: "Are there any mutual beneficial trade-offs between you and the counterpart?"	C	5.5	4
[26, 32, 38]	Question 8: "Do you think emotion has played a part in your decision?"	C	4.4	13

(continued)

Table 7 (continued)

References	Reality testing questions	Purpose of the questions	Usefulness score	Usefulness ranking
[28, 29, 31]	Question 9: "Will you do the same if you are your counterpart?"	C	4.6	10
[28, 29, 31]	Question 10: "Let me know your understanding of the grievances of your counterpart?"	C	4.6	11
[62, 65, 68]	Question 11: "What would be the impact on future collaboration with the counterpart should the dispute is not settled?"	C	5.4	5
[46, 68, 71]	Question 12: "Do you think you are partly responsible should settlement is not achieved?"	C	4.3	14
Questions about mediation process			*4.6*	*(3)*
[13, 46]	Question 13: "What are the benefits of including new members for both of the parties at a new communication session?"	D	4.0	15
[13, 46]	Question 14: "Will you consider inviting new members to join your team for the next round of negotiation?"	D	4.0	16
[4, 25, 53]	Question 15: "How about taking a fresh look of the case and your decision before the next round of negotiation?"	A, C, D	4.9	7
[25, 47, 53]	Question 16: "Let me know if your initial needs remain unchanged?"	C, D	4.5	12

(continued)

Table 7 (continued)

References	Reality testing questions	Purpose of the questions	Usefulness score	Usefulness ranking
[25, 47, 53]	Question 17: "Are there other options that would also achieve your needs?"	A, B, C, D	5.6	2

Note (A): Remind the disputing parties to allow adequate time in decision making; (B): Remind the disputing parties to consider the opposite; (C): Remind the disputing parties to be rational; (D): Remind the disputing parties to optimize the mediation mechanism

Table 8 Profile of the experts

Person	Years of experience	The majority of disputes involved	Countries of practice
No. 1	More than 30 years	Civil engineering works	UK, HK
No. 2	More than 30 years	Building works	HK
No. 3	More than 20 years	Civil engineering works	HK
No. 4	More than 40 years	Building works	HK, Mainland China
No. 5	More than 20 years	Building works	UK, US, HK
No. 6	More than 45 years	Building works	UK, HK
No. 7	More than 20 years	Civil engineering works	HK, Macau
No. 8	More than 30 years	Civil engineering Works	HK, UK

Bias minimizing arrangements in mediation rules are not explicit or not planned for. Moreover, mediator can play a pivotal role in keeping the disputing parties away from biases and behave in a rational manner. The findings of this study suggest making de-biasing function as one of the basic skills of mediators. Seventeen reality testing questions that have the effect of de-biasing are proposed. These questions can be incorporated in mediation training. With proper reality testing, mediator could guide the disputing parties to identify the fallacies in their decisions, some may have caused by biases.

When employing these reality testing questions, timing is critical. Thus, mediators have to pick the most appropriate occasions and deliver natural communication. For example, Question 6, Question 8 and Question 12, etc. are more suitable to be asked during caucuses to save faces for the biased affect party. Some questions, such as Question 7, are more flexible and can be used in both caucuses and joint meetings. Besides, mediator should pay attention to his/her manner in asking these reality testing questions. Reality testing can only be effective when the disputing parties feel safe and being respected. Well prepared and skillful mediators would smooth the mediation process and lead to efficient communications between the disputing parties.

Summary

People are reluctant to admit being affected by biases. This study captures the invaluable expert opinions of third-party neutrals on the usefulness of bias minimizing measures. Identified from literature, four bias minimizing approaches were considered: (i) Allow adequate time and effort in making decisions; (ii) consider the opposite and question oneself; (iii) be rational and consider long-term benefit; and (iv) dispute resolution mechanism design. The third-party neutrals involved in the study agreed that these are useful ways to minimize biases. These approaches are further operationalized for case of interpretation and implementation. Mediation is the most commonly used alternative dispute resolution mechanism used in Hong Kong, two mediation rules were studied to understand if these rules include bias minimizing provisions. It was found that de-biasing is not featured. Thus, stronger reliance will be placed on the mediators' advice as far as de-biasing is concerned.

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