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A Coding Scheme for Studying Group Interactions in International Negotiations: A Methodological Advance on the IPA protocol

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Our increasingly complex global business environment inevitably brings counterparts to the negotiation table. However, the lack of user-friendly coding systems, and other associated complexities over the last 6 decades, may have discouraged scholars to further their research in negotiation, communication, and its related fields. A viable coding scheme in place can help scholars and practitioners unfold the negotiation process by explaining the 'cause and effect' relationship within this social context. We propose a 24-category typology that stems from Bales' IPA model, with Field Theory as our theoretical framework. Our empirical data comprises of two-party negotiation simulations. Some distinct features of our proposed scheme when compared to the IPA model are reduced coding time experienced, a straightforward framework that is less complicated to follow, a valid and reliable scheme and lastly, a scheme with a robust theoretical-methodological underpinning in its development. The reliability of our scheme is determined through Krippendorff's Alpha (α). Through our methodological contribution, we aim to investigate the dynamics in small group interactions; and encourage future scholars to study the multidimensional nature of international negotiations.

Introduction

Negotiation, a transactional form of social interaction (Liu *et al.*, 2012), is often characterised through a buyer-seller relationship (Brett, 2000). It is an important management skill to have in today's competitive, business world. However, examining this goal-driven process (Bylund, Peterson and Cameron, 2012) that is both mixed-motive and multi-issue in nature (Graham, 1986; Liu, Chua and Stahl, 2010), is often time-consuming and labour-intensive (Weingart, Smith and Olekalns, 2004).

Interaction coding schemes are important research tools that can help structure and organise interactions for further empirical analysis (Angelmar and Stern, 1978; Schermuly and Scholl, 2012), especially in the areas of negotiation, communication, decision-making and related organisational and group business settings. Poole and Folger (1981) refer to them as 'translation devices' that help classify data into theoretical categories (Potter and Levine-Donnerstein, 1999, p. 267). In

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[Correction added on 18 Oct 2021, after first online publication: Authors and their details have been updated in this version.]

communication research, coding models have been instrumental in analysing student-teacher exchanges (Hermkes, Mach and Minnameier, 2017) or physician-patient interactions (Kaplan, Greenfield and Ware, 1989; Roter, Hall and Katz, 1988), or in organisational settings (Kauffeld, Lehmann-Willenbrock and Meinecke, 2018; Polley, 1987) but not specifically for negotiations. Reviewing literature over six decades led us to observe that theoretically validated coding schemes to study business negotiations are dated and scarce (Angelmar and Stern, 1978; Beers *et al*., 2007; Kelly, 2000; Putnam and Jones, 1982). They have lost their place in communication research and its related fields since the 1970s (Futoran, Kelly and McGrath, 1989; Kelly, 2000; Schermuly and Scholl, 2012). Some reasons for this are the time-consuming nature of their development (Beers *et al*., 2007; Garrison *et al*., 2006; Orlik, 1989), their costly nature (Schermuly and Scholl, 2012), low-user friendliness and insufficiently tested psychometric properties (Schermuly and Scholl, 2012).

In this study, we hope to advance the discussion on coding schemes and bridge the gap in management research by proposing a typology that is a methodological advance on the Interaction Process Analysis (IPA) model (Bales, 1950). We use the IPA framework in the development of our coding model because of its pioneering influence as a system for observing and analysing small group interactions and its impact on existing coding models over 6 decades (refer to Tables 5 and 6). For our theoretical framework we use Field Theory (Lewin, 1939), which provides a holistic view of human behaviour in social situations and in examining contemporary and relevant organisational issues. Additionally, Lewin's theory has played a significant role in bridging the gap between European and American thinking within the domain of organisational psychology (Sjøvold, 2007).

Our exhaustive and simplified 24-category coding typology can be used to categorise verbal interactions within business negotiations, to provide insight into the negotiation process. This can help unfold strategies and tactics to study relevant aspects of face-to-face interactions that will in turn help negotiators understand how to achieve their objectives, build stronger business relationships, and effectively manage conflict (Barthelmess *et al*., 2018). Some distinct features of our coding scheme are reduced coding time experienced, a straightforward framework to code negotiation interactions, a sound theoretical basis for its development and a scheme with a high-level of interrater reliability.

Underlying research problem

Interaction coding schemes were proposed within various disciplines, including computer sciences (Helgeson *et al*., 2006; Kleppe *et al*., 2003), mathematics (Gencer and Gürpinar, 2007), information technology (Olson *et al*., 1999) and engineering (Tsai, 2005). To use these systems, substantial knowledge of programming languages or experience in quantitative research methods is required. Conversely, limited studies have proposed coding schemes to study interactions within a business negotiation setting (Putnam and Fuller, 2014). For example, 'Towers Market Coding Scheme', intended initially for analysing decision-making activities (Weingart, Bennett and Brett, 1993) was later validated and used for coding negotiation behaviour (Weingart, Olekalns and Smith, 2004); and the SYMLOG software that was developed from Bales' earlier works including the IPA and Field Theory (Bales, Cohen and Williamson, 1979) is used to score group dynamics. The scoring method used is complex to understand and intensive scorer training is required to obtain reliable results (Hillmer, Hoehn and Blubaugh, 1994). The lack of research in addressing SYMLOG's ability to predict behaviour also results in more work needed to establish its validity (Keyton and Wall, 1989).

Fundamentally, efforts to explore communication processes has yielded unsatisfying results because inadequacies of conventional methodologies have not inspired scholars to study a complex phenomenon such as communications and other forms of social interactions (Hewes, 1979). A common and recurring issue identified is the lack of a satisfying theoretical rationale behind the development of interaction coding systems, which make them methodological ambiguous and insufficient for use (Ibid.; Potter and Levine-Donnerstein, 1999; Trujillo, 1986). Additionally, the narrowness of existing coding schemes and the conceptual vagueness in their category choices minimises their operational viability (Bonoma and Rosenberg, 1978) (refer to section 5.1 for more details).

The purpose of our study is two-fold: (i) to develop a valid and reliable coding scheme suitable for examining negotiation interactions; and (ii) to revive studies of such nature for scholars

to further their research in communication and related fields. The robust theoretical-methodological underpinning in our coding scheme can develop possible avenues for future research, which can in succession suggest implications for practice. Our proposed scheme is open for further analysis and modification by scholars who wish to use it in their future research.

Theoretical foundation

Viewing negotiations from the lens of field theory

> '*… there is nothing so practical as a good theory*' (*Lewin, 1951, p. 169*)

Negotiation is a process where one negotiator's behaviour acts as a stimulus for the other's party's response and the second negotiator's response provides stimulus for the first and the cycle goes on (Adair and Brett, 2005). In other words, communication can be structured in sequences that could emerge as indicators of negotiators' strategies and predictors of their behaviour (Olekalns and Smith, 2013). Lewin's Field Theory has been used over decades to study group issues in leadership (Liden and Antonakis, 2009; Lippitt, 1939); acculturation (Elsass and Veiga, 1994); change management in organisations (Dent and Goldberg, 1999); group performance (Haslett and Ruebush, 1999; Poole, 1981, 1983); negotiation (Spector, 1977); decision-making (Hirokawa and Johnston, 1989); management thinking and organisational studies (Weisbord, 1987); cognitive psychology (Smith, 1994); and even in medical research (Brager and Holloway, 1993; DePanfilis, 1996). We discuss our rationale behind using Field Theory as the overarching theory to examine group phenomena and interactions within the negotiation life-space as follows:

The fundamental postulate of Field Theory is that human behaviour should be understood as a function of the interaction between an individual and his or her psychological understanding of the physical and social environment (Kariel, 1956). 'Psychological environment' or 'life-space' or simply the 'situation' is defined as a person's perception of the outside world (White, 1978), i.e. the acquired characteristics, uniqueness, and behaviours of the individual that influence and has been affected by events and people within the environment (Schwartz, 1993). Lewin expressed this through a mathematical formula - $\boldsymbol{B = f\,(P,E)}$, where ***Behaviour (B)*** includes action, thinking and valuing; while ***Person (P)*** and ***Environment (E)*** are dynamically related, and together form the life-space (Burnes and Cooke, 2013). Lewin's attempt to explain behaviour in terms of interactions of environmental forces and personality characteristics meets the principal goal of science, which is to establish dynamic relationships between variables (Hall and Lewin, 1936). To elaborate, the field comprises of influencing forces and symbolic interactions that can structure and change group behaviours (Kessler, 2013). In a negotiation setting, interactions (verbal and/or non-verbal) between negotiators can be influenced by the mixed-motive ambience of trust and suspicion within the negotiation process as well as a unique mix of elements like expectation, perception, personality and the negotiator's behaviour (Spector, 1977). It is important to understand this to develop a coherent coding scheme that can analyse such negotiation interactions.

Our unit of analysis is 'verbal interactions' and we define an 'interaction' as an act or utterance exchanged between one group member to another member within the same group or another group. From a field theory perspective, a negotiator is either actively organising the field through his/her counter-replies or interpreting the field from his/her counterparts' counter-replies to meet specific goals and achieve objectives (Shwartz, 1993). Lewinian thinking argues that the environment can impact an individual's decision-making and problem-solving abilities, thereby changing his/her social behaviour. In other words, task and relational processes are interdependent and not mutually exclusive (Burnes and Cooke, 2013). Following on from this, the development of the IPA model, which was based on Lewin's ideas (Bales, 1970; Burke, 2006), viewed small groups as teams that solved problems and categorised patterns in interaction associated with problem-solving as socio-emotional and task-oriented (Duling, 1995). While the IPA model provides the essential methodological structure for our proposed coding scheme (discussed further under section 3.1), the selection of its 12 categories was based more on intuitive estimates and devoid of coherent theoretical orientation (Bonoma and Rosenberg, 1978). Thomas, Bull and Roger (1982) added to this by stating that the categories were general and not mutually exclusive for coding interactions. Since the drive to achieve specific goals within negotiations

can disrupt group harmony, our proposed coding scheme aims to facilitate the study of patterns in interactions at the different phases of group problem-solving and shed light into anticipating subsequent behaviours between negotiators. To achieve this, the cognitive focus from Field Theory can provide us with the theoretical direction required to be conceptually sensitive to business interactions exchanged within negotiations and to gain insight into behavioural movements, resulting from the interrelationship between personality characteristics and the psychological ambience within the negotiation process (Spector, 1977). To elaborate further, the conceptual limitations that exist within the IPA model and other coding schemes (Donohue, Diez and Hamilton, 1984) can be sought from Field Theory to study social interactions exchanged within business negotiations. Additionally, the operational limitation of the IPA model due to its prevalence in coding interactions in clinical settings (Bonoma and Rosenberg, 1978; Leary, 1957; Liberman, 1970) does not provide a complete picture of social interactions, within a business negotiation setting. By proposing a coding scheme that is conceptually designed to take into account both the *'positive*' and *'negative*' aspects of relational interactions as well as the *'rational*' and *'emotional*' aspects of content-related interactions, we aim to exclusively represent business interactions within negotiations (refer to *APPENDIX 2*).

The theoretical underpinning from the Lewinian paradigm along with the methodological underpinning derived from using the IPA model (Bales, 1950) as the root in the development of our proposed coding scheme, can further address the theoretical-methodological void that the IPA model and existing coding models lack (Angelmar and Stern, 1978; Beers *et al*., 2007; Putnam and Jones, 1982). Developing clearly defined constructs and modifying existing constructs to focus on the substantive aspects of negotiation (like power, value creation, trust, decision-making, to name a few), negotiators' personality characteristics and the negotiation atmosphere, can help us detect the evolution of interactions that unfold within a negotiation life-space. This can minimise any ambiguity that could arise during the coding process of negotiation interactions, thereby leading to a higher degree of validity and reliability of our proposed scheme. De Wever *et al*. (2006) state that a sound theoretical base can make a coding scheme more reliable and adequate for use in studies of this nature.

Though Field Theory has been often misunderstood for its complexity (Coghlan and Brannick, 2003; Deutsch, 1968; Lewin and Lorsch, 1939; Martin, 2003), it has been developed over a 25-year period (Lewin, 1939) and has extensively influenced the works of numerous renowned social psychologists and scholars (Burnes and Cooke, 2013). We support the notion that topics in group dynamics, group processes and other areas of social psychology would be difficult to observe without seeing the influence of Lewinian thinking (Saxe, 2010). Our use of an experimental data collection method like role-play negotiation simulations (Russell and Shepherd, 2010) to study group phenomena and interactions, compliments Lewin's experimental approach (Moreland, 1996). And while we intend to apply our coding scheme to real-world interactions, we argue that simulations can be a substitute for real-world interactions.

Methodological foundation

Bales Interaction Process Analysis (IPA) model

Our proposed coding scheme uses the IPA model (Bales, 1950) as the root for its development. Our methodological approach involved deconstructing and applying an existing model's typology to the data to construct coherent and robust coding protocols that can be used to categorise transcribed text. Some reasons for choosing the IPA model are: (i) Bales' main area of research focuses on group observations and on measuring interaction processes (Bales, 1950); (ii) the model has been used by numerous researchers over several decades in studies relating to group interactions and communications (Littlejohn, 2002; Nam *et al*., 2009; Rosenberg and Bonoma, 1974; also refer to Tables 5 and 6); (iii) it is the earliest and most durable system for examining face-to-face small group interactions (Bales and Strodtbeck, 1951; Perakyla, 2004); (iv) it has been used in many group contexts, e.g. in observing child protection teams (Bell, 2001), psychotherapy groups (Waxler and Mishler, 1966), on-line group interactions (Fahy, 2006), and construction-professionals' meetings (Gorse and Emmitt, 2007); (v) it consists of 12 structured set categories for studying both verbal and non-verbal expressions in face-to-face interactions, providing a systematic framework for coding observed interactions (Bales, 1950; Fahy, 2006).

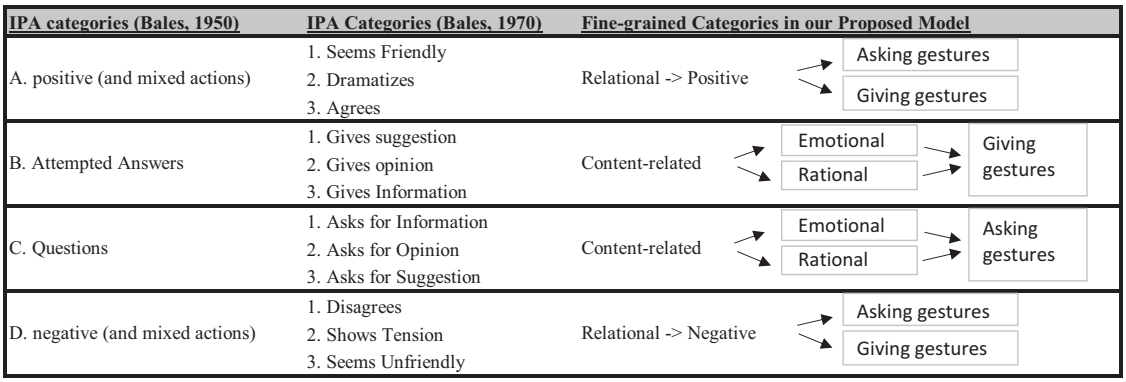

Figure 1. Development of the fine-grained categories from the IPA model

Though the study on group interactions has not yet regained the level of interest it once had, Bales' contributions in analysing groups over decades, is still by far the most significant work done in this domain (Futoran, Kelly and McGrath, 1989). The preceding section (section 3.2) discusses the details on how we used the IPA model to develop our proposed framework.

Building on the IPA typology for our proposed scheme

We integrate the IPA model in developing our framework of 'constructs.' Constructs are important in social psychology and can be defined as 'types of reactions' or 'types of influences' (Lewin, 1939). Since 'problems in sociology and psychology are interwoven, constructs are interdependent in nature' (ibid. p. 892). In the IPA model, group-behavioural patterns are classified into two main areas: task-related and socio-emotional (Bales, 1950; Fahy, 2006) (refer to *APPENDIX 1)*. The six socio-emotional activities include inter-personal behaviours while the remaining six categories are based on task-related input. Categories 1 to 3 and 10 to 12 cover socio-emotional areas and categories 4 to 9 cover task-related areas (McGrath, 1984). Socio-emotional categories capture interactions concerned with emotions in a social context, e.g. laughing to ease tension, showing solidarity, satisfaction, acceptance or agreeableness, disagreement or rejection, anxiety or withdrawal from discussion, and antagonism or defensiveness. And task-oriented categories capture actions relating to the agreement in discussion between the groups, e.g. making suggestions or giving directions or opinions, expressing desire, giving information or clarification, asking for information or clarification, opinions or suggestions or directions. Categories 1, 2 and 3 are targeted towards positive group statements and categories 10, 11 and 12 are targeted towards negative group statements (Bonoma and Rosenberg, 1978). Categories 4, 5 and 6 can be construed as assertive or command-related interactions and categories 7, 8 and 9 can be construed as information-seeking or submissive interactions (Bales, 1950; Bonoma and Rosenberg, 1978).

Explicating the coding process

Integrating Bales' 12 categories into our proposed framework (refer to Figure 1), we developed our 24-category, flowchart-based coding scheme (refer to *APPENDIX 2*).

In Step 1 of the coding process, we divide interactions broadly into '*Content-Related*' and *'Relational.'*. The former refers to the design and approach in carrying out a task, and the latter refers to the activities involved in managing task-oriented interactions, such as deciding what to do next, orchestrating the tasks and so on. Step 2 of the coding process involves classifying '*Content-related'* interactions into *'emotional'* and *'rational;'* and *'Relational'* interactions into *'positive'* and *'negative'*. These sub-categories were designed after our empirical analysis and brainstorming ideas with two other scholars in our research team. We noticed that business interactions are quite impersonal in nature and follow a transactional protocol (Brislin, Worthley and Macnab, 2006); whereas, emotional interactions are more personal in nature and can result in personality conflicts (Rose and Shoham, 2004). On the other hand, when

interactions are categorized as *'relational,'* they are categorised as either positive or negative. Our sub-categories were designed considering the problem-solving nature of interactions, given this 'cause and effect' relationship that exists in a social process (Lewin, 1939).

On analysing the empirical data further, we came up with Step 3, where we divided each of the four sub-categories into *'Asking'* and *'Giving'* gestures. Some examples for *'Giving'* gestures are: giving opinion, giving information or giving direction; and some examples for *'Asking'* gestures are: asking for reaffirmation, asking for direction or asking for suggestions/opinions. Lastly, step 4 involves selecting the most suitable coding category for each interaction. Please refer to *APPENDIX 2* for all the 4 steps.

The description of the 24 categories that were used to train the coders is provided in Table 1. And some examples of coded face-to-face interactions can be found in *APPENDIX 3*.

Methodology

Research setting

Our empirical data comprised of role-play simulations, a technique used over decades in investigating communications and negotiations (Adler and Graham, 1989; Bales, 1950; Donohue, 1981; Lewicki, 1997; McGrath and Julian, 1963; Morley and Stephenson, 1970; Putnam and Jones, 1982; Wall and Adams, 1974; Weiss, 2003). The negotiation exercise comprised of a British company selling their milk plant to Saudi Arabia, who also had offers from other foreign companies. Each group consisted of four or five members, emulating either a British culture or a Saudi Arabian culture. The same exercise was carried out by different participants over a 6-year period at the Business School. Instructions were provided to participants 2 weeks prior to the simulation date.

Each negotiation simulation was set for 30 minutes and was recorded using one fully adjustable camera and three or four fixed cameras. Valley, White and Iacobucci (1992) state that video recordings are exceptionally reliable tools for thoroughly analysing interactions. Our notion behind multiple recordings was to capture both verbal and non-verbal cues from participants (this helped clarify the intentions behind some ambiguous verbal interactions) and to identify the speakers.

Background of research team. The research team comprised of three scholars i.e. the master coder who was the main member in the research team (Syed and Nelson, 2015) and two other scholars. These three scholars were actively involved in designing the new coding scheme.

Background of participants. Participants in the study were Masters' business students from a reputed, long-established British university. The reasons for choosing these participants was because the criteria for their admission was to have a minimum of 2 years working experience in a managerial position, which would have exposed them to business negotiations in many ways and secondly, to collect as much data as possible for our empirical analysis. The participants were from diverse cultural backgrounds i.e. from USA, UK, Europe, and Asia (China, India, Middle East, Vietnam, Malaysia, and Singapore). The simulation exercise was an assessed component of the 'International Business Negotiations' course at the Business School.

Stages of the study

A total of 40 business negotiation simulations were recorded, and 6073 face-to-face verbal interactions were transcribed from both audio and video file formats. The study was carried out in two stages.

Pilot stage. A total of 1770 face-to-face interactions from eight simulation sessions were coded using the IPA model (Bales, 1950) to better understand its features and to gain a level of familiarity from using the model. Coding large amounts of interactions at this stage, helped us understand the IPA framework better, before designing our proposed coding scheme. Krippendorff (2004) states that developing a coding scheme based on past work can accumulate a cohesive body of knowledge. Additionally, Weber (1990) points out that a pilot stage of study minimises the need for subsequent adjustments in the development of coding categories (Gaur and Kumar, 2018).

Steps carried out in the pilot study stage. The aim at this stage was to develop a viable coding scheme. We transcribed 1770 face-to-face verbal interactions and coded these using the IPA model. Then the master coder carried out the coding on the same set of interactions using a rough structure of the proposed coding scheme. The ambiguous interactions encountered at this stage were

Table 1. Description of the 24 categories and the frequency of their occurrence

Codingcategory	Description	Percentage frequency of occurrence approximated (out of 6073 interactions)	Percentage frequency of occurrence approximated (out of 40 sessions)
1A	Rapport building statements, statements to welcome/greet the other party and exchanging statements to help foster a positive environment.	10.09%	100%
1B	Rapport building questions and exchanging questions to help foster a positive environment.	2%	82.50%
2A	Chuckling or joking to calm down or ease a tensed situation.	1%	30%
2B	Easing a tense situation with a question.	0.032932653	2.50%
3A	To acknowledge information exchanged (mostly business-related), and other signs of responsiveness like 'okay,' 'I understand,' 'yes it is' etc.	0.03%	100%
3B	To acknowledge information exchanged (mostly business-related) using a question.	0.15%	22.50%
4A	Setting the tone and direction for the conversation expressing emotion and proposing solutions in a way that is emotionally persuasive.	0	0
4B	Setting the tone and direction for the conversation and proposing solutions in a way that is persuasive and rational.	5.24%	100%
5A	Expressing opinions and desires in an emotional manner.	0	0
5B	Expressing opinions and desires rationally, and it also includes acts of worship and other ceremonial performances.	11.77%	100%
6A	Providing information and clarifying content-related matter with emotion.	0.02%	2.50%
6B	Providing information, orientation and clarifying content-related matter rationally.	44.10%	100%
7A	Appearing confused and asking questions in an emotional manner.	0	0
7B	Appearing confused and asking questions rationally. These could also include questions that warrant a simple 'yes' or 'no.'	6.83%	100%
8A	To ask questions in an emotional manner to explore the other party's intentions.	0	0
8B	To ask open-ended questions to explore the other party's intentions and questions that do not limit the other party's response.	7.59%	100%
9A	Asking questions in an emotional manner, with a tone of dependence on the other party's response.	0	0
9B	Asking questions with a tone of dependence on the other party's response or asking for some sort of direction from the other party.	1.42%	75%
10A	Asking questions but at the same time conveying one is unapproachable to the other party.	0	0
10B	Being aloof and unapproachable to the other party.	0.31%	22.50%
11A	Asking questions in an impatient and frustrated manner to the other party.	0.03%	5%
11B	Showing agitation, frustration and impatience towards the other party.	0	0
12A	Asking questions to ridicule or undermine the other party.	0	0
12B	Showing autocratic control through threats and undermining the other party's position	0	0

coded after consulting the two scholars on the research team and sometimes we referred to the pre-recorded videos to observe the non-verbal behaviours. The latter step helped in ironing out difficulties associated with coding to further enhance the features of our scheme.

Certain challenges were usually associated with renaming categories and sub-categories to make the model more straightforward to use. For example, instead of the sub-categories 'emotional' and 'rational' we initially thought of sub-categories 'emotional' and 'unemotional.' Similarly, instead of sub-categories 'positive' and 'negative' we initially thought of sub-categories 'favourable' and 'unfavourable.'

Lastly, we trained a fourth scholar i.e. the reliability coder (Syed and Nelson, 2015) to code the same set of transcribed interactions using both the IPA and the proposed scheme. This person was not involved in the development of the scheme and was paid to carry out the coding work. This step helped calculate the disagreements between the master coder and reliability coder (Bradley, Curry and Devers, 2007). These disagreements were discussed with the two other scholars. An approach called the third-party resolution helped avoid a coercive consensus approach to resolving the discrepancies (Syed and Nelson, 2015). Table 2 shows the accuracy rates, coding time, K-Alpha calculations, and related details for both the IPA model and our proposed scheme from this coding exercise.

Second stage. A total of 4303 transcribed verbal interactions from the remaining 32 negotiation sessions were coded using only the proposed scheme and without referring to the pre-recorded videos.

Steps carried out in the second stage. The aim at this stage was to assess the viability of our proposed scheme, to understand if coding categories could be assigned to every verbal interaction. The master coder initially coded 4303 transcribed verbal interactions using the proposed coding scheme. The same set of interactions were then coded by the reliability coder using the proposed coding scheme. Lastly, two other scholars on the research team coded 20% of the same data and verified any disagreements between coders.

From this coding exercise we observed that all 4303 transcribed interactions were assigned to a code. Unlike the IPA model, problems associated with multiple interpretations for the same interaction were largely eliminated. We also observed that

Table 2. K-Alpha calculations, accuracy rates and coding time for IPA and the proposed scheme in the pilot study stage

		IPA					Proposed Scheme				
Sessions	Number of interactions	Disagreements between coders	Accuracy rate	Coding Time (min. *)	Coding Time per minute of session duration (min. *)	K-Alpha (IPA)	Disagreements between coders	Accuracy rate	Coding Time (min. *)	Coding Time per minute of session duration (min. *)	K-Alpha (Proposed Scheme)
1	329	56	83.00%	75	2.5	0.7979	12	96.40%	55	1.8	0.9573
2	183	15	91.80%	55	2.2	0.9008	8	95.70%	40	1.6	0.9474
3	259	9	96.50%	60	2.2	0.9483	7	97.40%	45	1.7	0.9597
4	130	10	92.30%	40	2.1	0.8867	3	97.70%	30	1.6	0.9664
5	174	7	96.00%	50	2.2	0.9494	1	99.40%	35	1.6	0.9228
6	221	12	94.60%	60	2.6	0.9299	2	99.10%	40	1.8	0.9883
7	311	8	97.40%	65	2	0.9664	3	99%	45	1.4	0.9874
8	163	3	98.20%	50	1.8	0.9689	0	100%	30	1.1	1

Table 3. K-Alpha calculations, accuracy rates and coding time using the proposed coding scheme in the second stage (remaining 32 sessions)

	Proposed Scheme					
Sessions	**Number of interactions**	**Disagreements between coders**	**Accuracy rate**	**Coding Time (min. *)**	**Coding Time per minute of session duration (min. *)**	**K-Alpha (Proposed Scheme)**
9	123	12	90.20%	25	1	0.8796
10	124	8	93.50%	24	1.8	0.9072
11	156	6	96.20%	35	1.1	0.9474
12	129	4	96.90%	25	2.2	0.9621
13	135	2	98.50%	25	2.2	0.9801
14	159	1	99.40%	35	2.7	0.9918
15	108	1	99.10%	15	0.6	0.9851
16	177	2	98.90%	35	1.1	0.9839
17	142	0	100%	30	1	1
18	74	0	100%	15	1.3	1
19	133	2	98.50%	25	0.7	0.9789
20	110	0	100%	18	0.8	1
21	146	1	99.30%	25	0.8	0.9903
22	133	0	100%	20	0.6	1
23	154	1	99.40%	25	0.7	0.9909
24	135	1	99.30%	22	0.8	0.9904
25	94	2	97.90%	15	0.7	0.9719
26	145	0	100%	25	0.9	1
27	93	0	100%	15	1.3	1
28	128	0	100%	18	1.6	1
29	138	0	100%	22	1.7	1
30	109	0	100%	15	0.6	1
31	131	0	100%	20	0.6	1
32	121	0	100%	18	0.9	1
33	100	0	100%	15	0.9	1
34	134	0	100%	21	1	1
35	192	0	99.50%	40	1.2	0.9922
36	227	1	99.60%	45	1.4	0.994
37	82	0	100%	12	0.6	1
38	152	1	99.30%	20	0.7	0.9919
39	166	0	100%	25	0.9	1
40	154	0	100%	22	0.8	1

code 6B (the classification is 'content-related → relational → giving gesture) was used approximately 687 times, which is justifiable given that interactions exchanged within business negotiations are mostly task focussed i.e. more rational than emotional in nature. Table 3 shows the accuracy rates, coding time, K-Alpha calculations, and related details from this coding exercise.

Extending 12 categories to 24 categories made a big difference in reducing the coding time by nearly half. The extensive, compiled list of coding categories along with the straightforward descriptors helped simplify the coding process and keep uncertainties to a minimum. Argyris (1997) explains that 'the simpler the model, the more scientific its use and easier for the human mind to process as the human mind is a finite information processor' (p. 815).

Validity and reliability

The two parameters that define the level of usefulness of a coding instrument are validity and reliability (Compton, Love and Sell, 2012). Most often in research, these concepts get conflated though they are different from one another (Fiese and Spagnola, 2005; Folger and Poole, 1981). According to De Wever *et al*. (2006), existing literature on coding models present three salient features that make them appropriate for use:

(a) A sound theoretical basis for the development of a coding scheme;

(b) A well-considered unit of analysis; and

(c) An established level of reliability using common indexes, such as Krippendorff's Alpha (α) and Cohen or Fleiss' Kappa (K).

In the preceding sections, we verify our scheme using the above-mentioned criteria.

Validity. 'Validity,' a central concept in social science methodology (Kvale, 1995), is the extent to which a proposed concept is represented by its measurement, to understand if we are measuring what we want to measure (Babbie, 2013; Carmines and Zeller, 1979; Kvale, 1995; Neuendorf, 2016). Potter and Levine-Donnerstein (1999) argue that *face* and *construct validity* are sufficient to develop a coding scheme. *Face validity* is achieved when a coding system is logically consistent, and the categories are defined clearly (p. 137) (refer to Table 1). A coding scheme should have discreet and well-defined categories, should be straightforward and reliable to use, allowing coders to apply a consistent protocol during the coding process, especially when coping with large amounts of data (Garrison *et al*., 2006; Neuendorf, 2016). We draw on these ideas to develop our theoretical constructs attaching conventional meanings to them, to guide coders capture the essence of what is being coded, i.e. verbal interactions; and to understand if the classification of codes is consistent with the participants' interpretation of the results (Poole and Folger, 1981). We assessed this in three steps (refer to section 4.3.1.1).

Construct validity, on the other hand, is a term found in the qualitative traditions of phenomenology and it takes precedence over internal and external validity (Cherryholmes, 1988). It is central to what research findings mean and how theoretical constructs and observations are linked (ibid. p. 428). Using Lewin's Field Theory as our theoretical basis and integrating the IPA model in developing our constructs, we support construct validity. To elaborate, Field Theory examines patterns of interactions between individuals and the environment to understand how social groupings were formed, motivated, and maintained (Burnes and Cooke, 2013). The IPA model on the other hand, is recognised as the first complete scheme to categorise interpersonal interactions in small groups (Allen, Comerford and Ruhe, 1989), influencing numerous coding models over the last 6 decades (refer to Table 5). The robust theoretical-methodological underpinning in the development of our proposed scheme makes it a solid yardstick for examining group interactions within business negotiations.

Steps carried out to assess face validity. Two individuals were trained separately on the IPA model and our proposed coding scheme. One was a chartered accountant (Professional 1) and the other was a Project Manager (Professional 2). We chose real-world professionals who have zero experience in using coding models to gauge the validity, simplicity, and viability of our proposed scheme. Each coder was paid on an hourly basis (£10.33p/h) to carry out the coding exercise. The training dates and timings were decided based on the availability of the master coder and the respective professional.

In the first day of training, both coders were trained separately for 1 hour and 30 minutes. During this time, the master coder explained what the task would involve along with the coding process and the description of the categories, then coded 50 transcribed verbal interactions with them as practice and answered all their queries. They were then asked to independently code 50 interactions with the respective model they had been trained on. Similarly, in the second day of training, both coders were trained separately for 1 hour and 15 minutes. During this time, the master coder discussed their errors with them, answered all their queries and coded 100 new transcribed verbal interactions with them as practice. They were then asked to independently code a new set of 100 interactions each.

In the last day of training, both coders were trained separately for 45 minutes. During this time, the master coder discussed their new errors with them, answered all their queries and gave them a set of 150 new interactions to code independently. The results from this coding exercise can be seen in Table 4.

Professional 1 who was trained on the IPA model pointed out that she did not clearly understand the difference between codes 5 and 6. She also mentioned that codes 7 and 8 were somehow interlinked and this made the coding somewhat confusing. The common errors identified from using the IPA model were between 4 and 7; 5 and 6; and 7 and 8. Such interactions are often used in a negotiation environment. On the other hand, Professional 2 who was trained on the new scheme seemed confident in using the model after the second day's training. The common errors identified from using the proposed scheme were between 1A and 3A; and 7B and 8B.

Table 4. Validity and reliability findings

	Number of interactions	Number of errors	Accuracy rate	Coding time (min. *)	K-Alpha
(After Day 1 training)					
Professional 1: (IPA)	50	10	80.00%	50	0.7425
Professional 2: (Proposed Scheme)	50	6	88.00%	40	0.8209
(After Day 2 training)					
Professional 1: (IPA)	100	19	81.00%	65	0.7463
Professional 2: (Proposed Scheme)	100	7	93.00%	47	0.8910
(After Day 3 Training)					
Professional 1: (IPA)	150	21	86.00%	70	0.8599
Professional 2: (Proposed Scheme)	150	9	94.00%	45	0.9262
(Professional 2 was given a further 200 interactions to code using the proposed scheme)					
Professional 2: (Proposed Scheme)	200	15	92.50%	55	0.8983

We achieved face validity from this coding exercise and can say that our proposed coding protocols are theoretically valid or 'reasonable' (Shepard, 1993) to adequately support interactions within business negotiations.

Reliability. Reliability is the extent to which a measuring procedure can yield the same results on repeated trials (Carmines and Zeller, 1979; Neuendorf, 2016). Achieving reliability in a coding scheme greatly depends on the construct that is being coded (Beers *et al*., 2007).

To assess the third condition for coding models put forth by De Wever *et al*. (2006), we use Krippendorf's Alpha or K-Alpha (α), a statistical measure like the weighted Kappa coefficient (K) introduced by Cohen (1968) to calculate interrater reliability. It is solely based on units rated by two observers and is extensively used by researchers in content analysis (Gwet, 2011). Future scholars can refer to Hayes' macro for its computation (refer to *APPENDIX 4* for this link and for the formula to calculate K-Alpha).

According to Tinsley and Weiss (2000), 'interrater reliability' is a widely used term to measure the agreement between coders or observers, to evaluate if a coding instrument yields the same data within a tolerable margin of error (Hayes and Krippendorff, 2007). While scholars and statisticians have put forth dozens of different measures and statistics to index interrater agreement (Lombard, Snyder-Duch, and Bracken, 2010), there is no consensus on a universally accepted index of intercoder reliability. Popping (1988) identified around 43 indices for coding nominal categories. Some commonly used indices in communication are, percentage agreement Holsti's method, Scott's pi (p), Kappa coefficient (K) and Krippendorff's alpha (α) (Popping, 2009).

Our reasons for choosing K-Alpha (α) over Kappa's coefficient (K) to determine the extent to which the results produced by two coders are replicable and reliable are: (i) several methodological problems associated with Kappa's statistical measure (Feinstein and Cicchetti, 1990); (ii) Kappa's coefficient (K) corrects percent agreement, unlike Krippendorff's Alpha that calculates disagreements (Hayes and Krippendorff, 2007); (iii) lastly, Kappa's coefficient has certain characteristics that make it inappropriate for use as a measure for reliability, for example – unlike Kappa, K-Alpha takes into account the frequency of a code (Krippendorff and Fleiss, 1978). This is important since most coding schemes have categories that are not used often, and it is important for these codes to be accounted for reliably.

Steps carried to calculate interrater reliability. As K-Alpha leans towards '1', agreement between coders leans towards perfect congruence; and as K-Alpha leans towards '0', a low level of agreement prevails. For example in the pilot study stage, from the K-Alpha calculations (Table 2), we can see that the agreement between master coder and reliability coder while using the proposed scheme is high in all sessions when compared to the IPA model, i.e. K-Alpha coefficient $\geq$0.9474 and in the last session, the two coders had perfect agreement i.e. K-Alpha = 1. Similarly, K-Alpha was calculated for the remaining 32 sessions using the proposed scheme (Table 3). To reiterate, disagreements

between the coders were verified by the two other scholars on the research team.

However, to provide rigorous evidence and credible support for the reliability of our proposed scheme, we trained two professionals to carry out the coding independently, one using the IPA model and the other using the proposed scheme (refer to 4.3.1.1 for the training details). This time the master coder's experiences in using either of the schemes was not included in calculating the interrater reliability. Instead, we compared the coding carried out by the reliability coder with the coding carried out by each of the two professionals. The K-Alpha calculations from this coding exercise along with the accuracy rates, can be found in Table 4.

Discussion

We shed light on existing coding schemes over the last 6 decades, chronologically listing them in Table 5 and Table 6. This information was extracted from various sources (e.g. JSTOR, Wiley Online, Science Direct, Web of Science, and the Internet). The keywords used to do this were - *coding scheme, coding model, coding process, coding instrument, interaction coding, IPA model, and communication coding*. A total of 19 out of 29 existing coding schemes used the IPA model in its development, indicating the pioneering influence this model has had on many of the coding systems developed thereafter (Bales, 1950; Mills, 1964; Bonoma and Rosenberg, 1978; Fisch, 1994; Kettunen and Pyy, 2000; Schermuly and Scholl, 2012; Ghosh and Dickerson, 2015).

The lines highlighted (in grey) relate to coding models used in domains such as negotiation, communication, and organisational settings. In the preceding section, we explain how our proposed scheme is motivated by some of the shortcomings that existing coding models were deficient in, and we also highlight some of the features of our scheme while comparing it alongside existing coding models.

Position and contribution of our proposed scheme alongside existing coding models

The 'Behavior Scores System' (BSS) has categories that were based on only five factors namely, assertiveness, sociability, manifest intelligence, emotionality and task interest (Bonoma and Rosenberg, 1978). As a result, some categories were used as 'sink-all' or 'catch-all' categories to fit in miscellaneous interactions. This is similar to Rackham's coding system, where there was restriction on the coding activity for social interactions because of the limited set of task-oriented categories and hence a miscellaneous category was created to fit residual interactions (Rackham, Honey and Colbert, 1971). However, with our proposed scheme, while some of the coding categories were not used often and sometimes not used at all (refer to Table 1 for their percentage frequency of occurrences), we still did not have 'sink-all' categories for miscellaneous or residual interactions. Our proposed coding categories considered most types of interactions exchanged in a business negotiation setting.

The 'Feedback Rating instrument' by Leathers (1971) had its limitations too. It did not code the functional meaning of verbal interactions unlike our proposed scheme but focused on the perception of interactions that were based on certain dimensions such as the measure of relevance, concision or tension between interactants (McCroskey and Wright, 1971). It measured the quality of communication in general, to examine if this is a determinant of group product (Leather, 1971). Our coding scheme facilitated the study of group interactions within business negotiations, since we support the view that categorising interactions can enable the examination process (Guetzkow, 1950).

The SYMLOG and the 'Discussion Coding Scheme' (DCS) are coding software, where prior training is required for the coder. In the case of DCS, the training involved reading an extensive coding manual that included video exercises in TV format, undertaking standardised training and buying the coding software (Schermuly and Scholl, 2012). This lengthy process is also comparatively expensive to run. Furthermore, the authors admit that while the validity of DCS was established, reliability measures for real-time coding were much lower (Schermuly and Scholl, 2012). SYMLOG on the other hand, requires 6 weeks of coder training (Beck and Fisch, 2000). Our flowchart-based typology is relatively straightforward to follow, inexpensive to use, limits subjective interpretation during the coding process and requires 2–3 hours of training.

'Group Field Dynamics' is a computer-assisted model used for determining team effectiveness. It requires the coder to apply general

Table 5. Coding schemes based on the IPA model (Bales, 1950)

Coding Schemes based on the IPA model (Bales., 1950)				
S. No.	Coding Scheme/Model	Theoretical and/or Empirical Basis:	Practical Implications:	Contexts applicable to:
(1)	Interpersonal Diagnosis of Personality System (Leary, 1957)	• Based on the IPA model and consists of 16 categories (Bonoma and Rosenberg, 1978)	• Designed to aid clinicians in diagnosing personality functions (Leary, 1957; Bonoma and Rosenberg, 1978)	Psychotherapeutic setting (Perr, 1958)
(2)	Interactions Process Scores (IPS) (Borgatta, 1961)	• Based on the IPA model (Borgatta, 1961)	• To study only behavioural characteristics of participants in role-play interactions, a project that was supported by the US Air Force (Borgatta, 1964)	Aviation sector (Borgatta, 1964)
(3)	'Sign Process Analysis' model (Mills, 1964)	• Based on the IPA model (Hare, 1973; Mills, 1964)	• To study group dynamics by coding the hierarchical relationships among the senders and recipients (Mills, 1964; Rosenbaum, 1965)	Clinical settings (Mills, 1964)
(4)	Behavior Scores System (Borgatta, 1963)	• Based on the IPA and the IPS models (Borgatta, 1963)	• Describes group interactions in terms of peer assessments (Borgatta, 1963)	Small group interactions (Borgatta, 1963)
(5)	Feedback Rating Instrument (Leathers, 1971)	• Based on Bales IPA model (Leathers, 1971)	• It measures discussant's contributions in small group communication processes (Leathers, 1971)	Small group interactions (Leathers, 1971)
(6)	Rackham's coding system (Rackham, Honey and Colbert, 1971)	• Based on the IPA model (Rackham, Honey and Colbert, 1971)	• Used to examine social interactions at work with a view to change worker behaviour (Rackham, Honey and Colbert 1971)	Small group interactions (Rackham, Honey and Colbert, 1971)
(7)	Social Influence Rating System (Rosenberg and Bonoma., 1974)	• Based on the IPA model and derived from social influence theory (Bonoma and Rosenberg, 1978)	• To code group therapy processes (Rosenberg and Bonoma, 1974).	Group Therapy (Rosenberg and Bonoma, 1974)
(8)	SYMLOG - Systematic Multiple Level Observation of Groups (Bales, Cohen and Williamson, 1979)	• Based on the IPA model and Field Theory (Bales, Cohen and Williamson, 1979; Blumberg, 2006)	• It considers both verbal and non-verbal behaviours to make group to group comparisons (Bales, Cohen and Williamson, 1979)	Small group interactions (Blumberg, 2006)
(9)	Conversation Exchange Analysis (Thomas, Bull and Roger, 1982)	• Based on IPA model and the scholarly works of Danziger and Greenglass, Wilson and Morley and Stephenson (Thomas, Bull and Roger, 1982)	• It is used to classify speech and focusses more on types of information exchanged (e.g. beliefs, giving examples, telling stories etc.) (Thomas, Bull and Roger, 1982)	Applicable to a wide variety of situations and relationships (Thomas, Bull and Roger, 1982)
(10)	'Group Field Dynamics' (Polley, 1987)	• Based on Bales' SYMLOG and Lewin's field theory (Polley, 1987)	• A computer assisted, 26 category model with an automated report writer used to explore polarisations within management groups (Polley, 1987)	Organizational settings (Polley, 1987)

(Continued)

Table 5. Continued

Coding Schemes based on the IPA model (Bales., 1950)				
S. No.	Coding Scheme/Model	Theoretical and/or Empirical Basis:	Practical Implications:	Contexts applicable to:
(11)	Foshee and Manos' speech act coding scheme (Foushee and Manos, 1981)	• Based on Bales IPA model (Foushee and Manos, 1981; Kim *et al*., 2010)	• Consists of ten elements and used to observe communication between crewmembers and their performance (Foushee and Manos, 1981; Kim, Park, Han and Kim, 2010)	Aviation sector (Kim, Park, Han and Kim, 2010)
(12)	Kankee and Foushee's speech act coding system (Kanki and Foushee, 1989; Kim, Park, Han and Kim, 2010)	• Based on Bales IPA model (Kanki and Foushee, 1989; Kim, Park, Han and Kim, 2010)	• Consists of 19 elements and used to understand the correlation between communication and operating performance of crew members (Kanki and Foushee, 1989; Kim, Park, Han and Kim, 2010)	Aviation sector (Kim, Park, Han and Kim, 2010)
(13)	Conference Coding Scheme (Fisch, 1994)	• Based on the IPA model and the SYMLOG (Fisch, 1994)	• Consists of 15 categories and developed to examine behavioural level of interactions (Breuer, 2010; Schermuly and Scholl, 2012)	Conference settings (Breuer, 2010)
(14)	'Speech Act Coding' (Kettunen and Pyy, 2000)	• Based on the IPA model (Kettunen and Pyy, 2000)	• Consists of eleven elements and used to analyse communication (Kettunen and Pyy, 2000)	Nuclear plant sector (Kettunen and Pyy, 2000)
(15)	The Advanced Interaction Analysis for Teams (Act4teams) (Kauffeld and Lehmann-Willenbrock, 2012)	• Based on the IPA model, SYMLOG and KONFAD (Kauffeld and Lehmann-Willenbrock, 2012)	• For analysing real-time meetings (Kauffeld and Lehmann-Willenbrock, 2012; Kauffeld, Lehmann-Willenbrock and Meinecke, 2018)	Organizational settings (Kauffeld and Lehmann-Willenbrock 2012)
(16)	An extended speech act coding system (Min, Chung and Yoon, 2004)	• Based on the IPA model (Min, Chung and Yoon, 2004)	• To analyse verbal communication of main control room operators during emergency conditions (Min, Chung and Yoon, 2004)	Aviation sector (Min, Chung and Yoon, 2004)
(17)	Multimodal coding scheme (Falcon *et al*., 2005)	• Based on the IPA model (Falcon, Leonardi, Pianesi and Zancanaro, 2005)	• To study behaviour that hinders performance in teams (Pianesi *et al*., 2008)	Aeronautics sector (Pianesi *et al*., 2008)
(18)	Discussion Coding Scheme (DCS) (Schermuly and Scholl, 2012)	• A coding software that is based on IPA, TEMPO, Act4Teams (Shcermuly and Scholl, 2012)	• To examine face-to-face communication in real time or in video-supported formats (Schermuly and Scholl, 2012)	Communication processes (Schermuly and Scholl, 2012)
(19)	Macro-ergonomic model (Ghosh and Dickerson, 2015)	• Based on the IPA model (Ghosh and Dickenson, 2015)	• Use to analyse communications (Ghosh and Dickenson, 2015)	Construction-work sector (Ghosh and Dickenson, 2015)

principles for coding intuitively (Polley, 1987). Similarly, the ACT4TEAMS model is software-assisted and uses the INTERACT software to facilitate data processing and analysis (Kauffeld, Lehmann-Willenbrock and Meinecke, 2018). Additionally, 200 hours of coding training is required that includes studying from the coding handbook, undertaking sample transcripts and group

Table 6. Coding schemes not based on the IPA model (Bales, 1950)

Coding Schemes not based on the IPA model (Bales, 1950)				
S. No	Coding Scheme/Model	Theoretical and/or Empirical Basis:	Practical Implications:	Contexts applicable to:
(20)	Decision Proposal Coding System (Poole and Fooger, 1981)	• Consists of eleven categories and uses methods of grounded theory construction to generate the coding system (Poole and Fooger, 1981)	• To study the interaction patterns within groups during decision-making (Poole and Folger, 1981)	Small group interactions (Poole and Folger, 1981)
(21)	Pattern Variable Coding System (Mabry, 1975)	• An analytic paradigm taken from Talcott Parsons (Mabry, 1975)	• Focused more on interactions relating to conflict, tension and disagreement than on positive interactions (Poole and Folger, 1981)	Small group interactions (Poole and Folger, 1981)
(22)	Group Working Relationships Coding System (Poole, 2007)	• Based on empirical analysis from decision-making group studies (Poole, 2007)	• Designed to gauge the general working atmosphere and decision-making in groups	Small group interactions
(23)	TEMPO - Time by Event by Member Pattern Observation (Futoran, Kelly and McGrath, 1989)	• Based on McGrath's time-based theory of functional groups (Futoran, Kelly and McGrath, 1989)	• A computer programming-based coding system developed to establish strong empirical links between group processes and group productivity (Futoran, Kelly and McGrath, 1989)	Psychotherapy sector (Futoran, Kelly and McGrath, 1989)
(24)	Towers Market Coding Scheme (Weingart, Bennett and Brett, 1993)	• Based on existing coding schemes (e.g. Lewicki, Saunders and Minton, 1985; Pruit and Carnevale, 1993; Weingart, Smith and Olekalns, 2004).	• To identify theoretically important negotiation behaviours (Weingart, Smith and Olekalns, 2004)	Negotiation settings/small group interactions (Weingart, Smith and Olekalns, 2004)
(25)	Group Development Observation System (Bordia, Difonza and Chang, 1999; Wheelan and Williams, 2003)	• Based on the concept of group development (Tuckman, 1965; Bordia, Difonza and Chang, 1999)	• The eight-category system represent verbal interactions associated with various stages of group development (Wheelan and Williams, 2003; Wheelan, Davidson and Tilin, 2003)	Organizational settings (Wheelan, Davidson and Tilin, 2003)
(26)	Turn-and-episode-based Coding System (Jones *et al.*, 1999)	• Developed from the communication accommodation theory (CAT) (Jones, Gallois, Callan and Barker, 1999)	• Focusses on individual interactions rather than on the relationship between two members of a dyad (Jones, Gallois, Callan and Barker, 1999)	Academic setting (Jones, Gallois, Callan and Barker, 1999)
(27)	A Coding Scheme by Olson, Olson, Carter and Storossen (Olsonet al *et al.*, 1999)	• Based on empirical data of groups engaging in collaborative tasks and software design meetings (Olson, Olson, Carter and Storossen, 1999)	• A eleven-element scheme could only evaluate communication at the paragraph level and focused on group's problem solving activities (Olson, Olson, Carter and Storossen).	Information Technology sector (Olson, Olson, Carter and Storossen, 1999)

(Continued)

Table 6. Continued

Coding Schemes not based on the IPA model (Bales, 1950)				
S. No	Coding Scheme/Model	Theoretical and/or Empirical Basis:	Practical Implications:	Contexts applicable to:
(28)	A Coding Scheme by Schraagen and Rasker (Schraagen and Rasker, 2001)	• Based on speech act theory (Schraagen and Rasker, 2001)	• A seven-element scheme to analyse communication in fire-fighting simulations (Schraagen and Rasker, 2001)	Fire services sector (Schraagen and Rasker, 2001)
(29)	A version of speech act coding scheme (Kim *et al.*, 2010)	• Based on a version of the speech act theory (Kim, Park, Han and Kim, 2010)	• To explain communication patterns of operators' conversations in abnormal conditions within a nuclear power-plant environment (Kim, Park, Han and Kim, 2010)	Nuclear plant sector (Kim, Park, Han and Kim, 2010)

discussions (Ibid. p. 426). On the other hand, our proposed scheme can be used independently by the coder and follows a less tedious coding process.

Lastly, validity and reliability were important criteria in the development of our coding scheme. The BSS did not have reliability and validity tests conducted for it (Borgatta, 1963). The 'Decision Proposal Coding System' and the 'Pattern Variable Coding System' did not provide validating evidence to support the observations (Poole and Folger, 1981). And the 'Towers Market Coding Scheme,' could not be validated as some codes worked and some others did not work when coders independently coded sections of the transcripts (Weingart, Smith and Olekalns, 2004). So, to ascertain the quality of a coding instrument in studies of such nature, we assessed the validity and reliability of our proposed scheme in line with the three criteria put forth by De Wever *et al*. (2006).

Details on this can be found under section 4.3.

Comparing the IPA model to our Proposed Scheme while highlighting some distinct features

In the pilot study stage, the average coding time per minute of a session is 2.2 using the IPA model and 1.8 using the proposed coding scheme (refer to Table 2). In the second stage of the study, the average coding time per minute of a session is 1.1 using the proposed coding model (refer to Table 3). So, compared to the IPA model, our proposed coding scheme ***reduced the coding time*** of interactions per negotiation session by 25 to 40 percent. This was further validated by the two trained professionals who carried out the coding activity at the latter stage of the study (refer to Table 4).

In our proposed coding scheme, all verbal interactions could be assigned to a coding category, and coders did not get confused with multiple interpretations of the data. To elaborate, during the coding process, there were ***'no catch-all'*** categories to classify the residual interactions like in the IPA model. Bales (1970) himself admitted that coders are sometimes required to make complicated judgements. for example, categories 3, 5, 6 and 10 have become 'sinks' in coding usage, i.e. 'catch-all' categories used by raters, when multiple coding is possible (Ibid., p. 134). Thomas, Bull and Roger (1982) stated that the IPA categories are quite general and not mutually exclusive for coding interactions, and the different levels of analysis is confusing as it disguises the function of information exchanged with the way it is exchanged. One reason for this is that the original IPA model was developed for collaborative situations like group therapy, counselling, and other similar group interaction settings (Bales, 1950; Talland, 1955). Our proposed coding scheme focusses on substantive aspects of negotiation: value creation and value claiming (Weingart, Smith and Olekalns, 2004). In other words, while we used the IPA model as the root in constructing our proposed scheme, we developed our constructs to capture and categorise interactions specific to negotiations.

Another feature is the ***higher accuracy rates*** achieved from using the proposed coding scheme when compared to the IPA model (refer to Tables 2, 3 and 4). The accuracy rates remained consistently high while coding 4303 transcribed

verbal interactions using the proposed coding scheme in the second stage of the study and when Professional 2 carried out the coding (refer to Tables 3 and 4).

A fourth feature relates to the time for training new coders and for carrying out the coding. The total coding training time for the reliability scholar and the two professionals took approximately 1.5 to 3 hours. While the reliability coder had prior knowledge in using the IPA model, the two professionals had no experience in using coding models. And though the training time was the same for both professionals, the coding time using the proposed coding scheme is considerably lower (refer to Table 4). The ***straightforward and exhaustive coding categories*** made the coding process less complex. Professional 2 who was trained on the proposed scheme mentioned that he was more confident to complete the coding exercise for the remaining 400 interactions after the second day's training and his training notes helped him. Another observation was that his turnaround time was a lot quicker when compared to Professional 1 who was trained on the IPA model.

Lastly, our proposed scheme draws from the limitations observed in other coding models, uses Field Theory (Lewin, 1939) as our theoretical basis and incorporates the IPA model (Bales, 1950) in its framework. Bonoma and Rosenberg (1978) state that Bales' selection of categories was atheoretical and devoid of coherent theoretical orientation as it was based more on intuitive estimates. While existing coding models did not have both a theoretical and methodological foundation in their development (Angelmar and Stern, 1978; Beers *et al*., 2007; Putnam and Jones, 1982), our proposed scheme is a relatively robust and reliable yardstick for coding and analysing interactions within negotiations, given its theoretical-methodological underpinning.

Limitations of our study

We discuss some limitations to provide readers with holistic understanding on the relevance of the study and help them gain a better understanding of the conditions under which our results may be interpreted. In the pilot study stage, we sometimes referred to video-recordings, to observe the para-verbal and non-verbal cues of negotiators. This step guided us in interpreting subtleties and in minimising ambiguity when multiple interpretations for coding was possible, to further enhance the features of our model. While we propose our scheme as an alternate methodology to categorise verbal interactions in business negotiations, we could not identify an alternative step that could be carried out to enhance the features and to develop our constructs.

Secondly, our proposed coding scheme has been verified only in a two-party group negotiation setting because of mostly time constraints. We are open to the prospect of assessing the viability of our proposed scheme in multi-party negotiations and examining other communication settings, for example – employer-employee interactions, buyer-seller relationship, and so on.

Lastly, flexibility is important in exploring understudied areas of research such as the development of a coding scheme (Kelly, 2000; Poole and Folger, 1981; Schermuly and Scholl, 2012). While Krippendorff' Alpha (α) existed for over 30 years and meets all the conditions as a reliable statistical measure for content analysis and similar data (Hayes and Krippendorff, 2007), we are yet to calculate interrater reliability using other statistical measures and macros computed by scholars, on our proposed coding scheme.

Future avenues for research

Negotiations are undertaken in several business contexts namely, mergers and acquisition deals, employer-employee dialogues, management discussions, vendor pricing and sales, property management, to fulfil contractual obligations and in international diplomacy matters (Harroch, Lipkin and Smith, 2017; Lax and Sebenius, 2003). Over the last 4 decades, research in negotiations was studied from several disciplines such as social psychology, organizational behaviour, communications, decision sciences, economics, marketing, international relations and others because of its multidimensional nature (Borbely *et al*., 2017; Putnam and Jones, 1982; Rubin and Brown, 2013; Strauss, 1978). For example, within academia, negotiation theory and practice are combined with a variety of academic disciplines such as game theory, social psychology, law, communication, sales and others (Honeyman and Schneider, 2018, 2019). However, in recent years the need to examine interactions within negotiations increased

with a view to explicate mechanisms that can help individuals understand how to negotiate competently (Diez, 1983). We corroborate with Druckman (2001) on the notion that the process of negotiations is yet to come under one shared theoretical umbrella.

Thousands of decisions are made every day by management teams, government boards and medical units (Poole, 1983). It would be interesting to study the steps or phases involved in collaborative decision-making and understand how groups solve problems to achieve specific goals. Our proposed coding scheme can lead to in-depth investigations within negotiations and shed light on certain patterns in interactions that can lead to better outcomes in negotiations. We suggest future studies be directed towards examining existing tools and models to study complex tasks like negotiation and conflict management. Learning the substantive aspects of negotiating can equip both scholars and practitioners with improved knowledge on the subject. Building on our scholarly findings, we aim to increase awareness and influence the way people think, communicate, and behave while confronting moral issues and ethical dilemmas. Additionally, real-world negotiators can use this knowledge to alter their style of negotiating, understand how to develop better working relationships, create better outcomes and collaborative partnerships.

Secondly, we suggest future studies be directed towards either developing new coding schemes or modifying existing coding schemes since studies of this nature are dated and scarce (Angelmar and Stern, 1978; Beers *et al*., 2007; Poole and Folger, 1981; Putnam and Jones, 1982). It would be important to explore procedures for analysing and reporting interrater reliability on these schemes (Lucas, Gunawardena and Moreira, 2014) along with developing streamlined procedures and approaches to study group behaviour and analyse group dynamics within negotiations, conflict management, decision-making, leadership etc. This can pave way for scholars to better understand the particularities impeding communication in an International Business (IB) context.

Conclusion

The main aim of this study is to propose a viable and user-friendly coding system to help interested scholars further their studies in communication, business negotiations and other related processes involving group interactions. Our framework is an advance on the IPA methodology that is a 'unified and well-developed theory on small group interactions' (Littlejohn, 2002, p. 301). A concise methodological framework in place can help study the constellation of acts and communication that make up a negotiation process. Since coding schemes are important research tools or translation devices for organising data into categories (Angelmar and Stern, 1978; Poole and Folger, 1981; Schermuly and Scholl, 2012) and for accurately measuring communication and behaviour (Siminoff and Step, 2011), we stress the importance of such studies for two main reasons:- (i) theoretically validated and reliable coding schemes are scarce and dated for studying interactions exchanged within negotiations and related group processes (Kelly, 2000; Putnam and Jones, 1982); (ii) and, research of such nature has implications for conflict management, negotiation and communication scholars, as well as for practitioners.

Our proposed coding scheme can open pathways for future investigations to be carried out, to study patterns and sequences in interactions exchanged within business negotiations. Following this, our scholarly approach to studying negotiation interactions can aid real-world negotiators with strategies that emerge through these patterns and sequences, that can help them progress towards meeting their business goals and reaching mutually satisfactory settlements. Exploring methodological practices to reframe global research (Bell, Kothiyal and Wilmott, 2017) seems the way forward, and we hope to achieve a part of this through our study.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix 1 - Bales 'Interactive Process Analysis' (IPA) model (Source: Bales, 1950)