FOUNDATIONS AND EVIDENCE FOR AN INTERACTION-BASED APPROACH TO CONFLICT NEGOTIATION

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This paper outlines 4 assumptions behind attempts to explain the sequential organiza-tion of communication behavior during conflict. These assumptions were supported by an analysis of behavioral sequences coded from 9 hostage negotiations and 20 divorce mediations. Analyses showed that negotiators use only a small proportion of available responses to other party's behavior, and that this proportion rapidly decreases as sequence length increases. Critical to this channeling in behavior was the triple-inter-act (i.e., cue-response-cue-response), which represents the maximum sequence length required to enable accurate prediction of negotiators' future behavior. More detailed analysis showed that the triple-interact reduced uncertainty in behavior by over 70%, which compares to less than 1% from knowledge of negotiation context and approxi-mately 10% from knowledge of individual differences.

Efforts to understand the complex behavioral processes that drive conflict originate from one of two perspectives. Most research has focused on the interpersonal dimensions that characterize negotia-tion and how changes in these dynamics allow an interaction to unfold. Constructs such as facework, affiliation, interdependence, and behavioral intensity have each been shown to play a role in the progress of negotiations (Donohue & Hoobler, 2002; Rogan & Hammer, 1994; Taylor, 2002a) and the outcome that is achieved (Olekalns, Smith, & Kibby, 1996). A second approach to understand-ing conflict is to looks for consistent patterns in the sequences of actions that underlie and give rise to the patterns found at the conceptual level. Although several researchers have discussed this pro-cess in relation to negotiation (Putnam, 1985), evidence of the behavioral sequences that actually shape interaction is only beginning to emerge (Olekalns & Smith, 2003; Weingart, Prietula, Hyder, & Genovese, 1999). This paper adds to that growing body of work by explicating and then testing some of the assumptions that underlie an interaction-based approach to understanding conflict. These assumptions represent basic predictions about the character and limits of behavioral organi-zation in conflict.

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The Organization of Interaction Sequences

An interact-based explanation of negotiation proposes a changing set of responses that is shaped by prior acts and expectations about the conflict, and evolves over time as negotiators' make decisions and pursue their goals and concerns. Argyle (1969, p. 115), for example, has suggested that "utterances are generated by other utterances", and Auld and White (1959, p. 100) emphasize "the lawfulness and inter-connectedness of the events' in communication." The negotiation process is viewed as a series of actions and reactions where recurring patterns constrain interaction by reducing the probability that other categories of talk will occur (Putnam, 1985). Watzlawick, Beavin, and Jackson (1968, p. 131) describe this organization as reflecting a more general "limitation" principle, where every exchange of messages narrows down the number of possible next moves and refines the eventual resolution. Once a dialogue has begun to follow a particular path, negotiators loose the choice of acting in other ways, and the larger the sequence of acts considered the large the discrepancy between what could have occurred and what does occur in practice.

A number of theoretical concepts in conflict research instantiate this constraining process. Conflicts are social interactions based on a set of mutually understood rules and associated cognitive scripts that guide negotiators' behavior down established paths of interaction (Wilson & Smith, 2000). Such scripts are triggered by a particular context and are pursued with greater or lesser rigor depending on the suitability and legitimacy of the rules to the current context, and the success associated with implementing the rules in the past. The result is constraint in the cues and responses used by negotiators, such as occurs with move-countermove sequences (Willson, 1998), "matching" (Smith, Pruitt, & Carnevale, 1982), and "tit-for-tat" behaviors (Komorita, Parks, & Hulbert, 1992). These sequences reflect instances of constraint because negotiators are more likely to follow a behavior with a particular (usually identical) response than they are any alternative response. Other types of sequence, such as "mismatching" (Pruitt & Syna, 1985) or non-contentious reciprocation (Brett, Shapiro, & Lytle, 1998), constrain dialogue in a very different way, redirecting negotiators away from one emphasis and towards a different pathway of development. Importantly, in all of these examples this constraint can occur across a range of different messages including procedural statements, offers and concessions, threats, and affect statements (Donohue, 1981; Gottman, Markman, & Notarius, 1977; Putnam & Jones, 1982).

In considering the organization of interaction sequences, it is important to consider not only the effect of the preceding behavior but also the history of behaviors within the sequence (Clarke, 1977). For example, while evidence suggests that the typical response to a compliment is a cooperative behavior focused on identity, this is not always the case. Why this is not always the case could be explained by a number of contextual factors, but it may also be explained by the behaviors that occurred previous to the last. This broader constraint is evident in a range of phenomenon, including that of conflict spiraling, where the use of increasingly intense behavior limits the focus of interaction and constrains the options and responses available to the other party (O'Conner & Arnold, 2001; Taylor, 2002a). This spiraling can occur over large sequences of behaviors with additional behaviors serving to further constrain the focus of interaction. Such consistent evidence of constraint leads to the following expectation:

H1: Negotiators' will use only a small proportion of possible responses to the other party's behavior, with this proportion becoming smaller as the length of the interaction sequence increases.

The Extent of Constraint

The possibility of interaction being organized by past behavior raises the related question of how many past behaviors constrain the focus of interaction. There has been considerable theoretical debate over the extent interaction is constrained by previous behaviors. The possibility that communication behavior is organized by a discrete number of preceding acts is an important principle because it begins to quantify the impact of previous behaviors and previous strategies on current movement within the interaction. At a general level, Allport (1962) characterizes the possibility as one of collective structure, where behavior of one speaker becomes interlinked or interwoven with the cue of the other speaker. The fundamental analytical unit for understanding the interaction process is the interact (a sequence of two behaviors), the double interact (a 3-behavior sequence), the triple interact (4-behaviors), and so forth. The minimum sequence length is defined by the final message of the sequence plus the number of antecedent messages that directly constrain this final behavior. For example, the double interact (i.e., 3-behavior sequence) consists of an initial cue and a response that constrains the first speakers' subsequent adjustment of the message (Weick, 1968). Consistent with this example, some authors argue that the double-interact is the typical sequence length over which behavioral constraint occurs (Krain, 1973; Mark, 1971; Weick, 1969). However, others consider successive pairs of antecedent and subsequent events, the triple-interact (e.g., cue-response-cue-response), as central to the organization of interaction (Cappella & Planalp, 1981; Mishler, 1975; Watzlawick, Beavin, & Jackson, 1968).

Research examining the order of sequential constraint casts a similar mixed picture regarding the importance of the double- and triple-interact in organizing interaction. Much of the early research into human interaction such as marital communication (Parks et al., 1975 cited in Penman, 1980), informal conversations (Thomas, 1985; Thomas, Roger, & Bull, 1983), and interview communication (Hawes & Foley, 1973) have found that dialogue is principally structured by the double-interact. For example, Gottman, Markman, and Notarius (1977) showed that marital discussion could be decomposed into 2-behavior loops and 3-behavior chains (e.g., probe feeling, mindreading), where these sequences had functions such as ascertaining the other party's concerns or forming a "contract" regarding future behavior. In contrast, other research has indicated that the triple-interact is the fundamental unit of the interaction process. For example, in a detailed analysis of long-term partner discussion, Penman (1980) found that an average of 3.86 behaviors directly influenced the content of the current message, with this value being slightly lower when dialogue was coded as actual messages (e.g., agree, concede) compared to latent relational strategies (e.g., cling, oblige). Penman found considerable variation in the extent of constraint in couples' behavior, with the minimum sequence length ranging from 2-behaviors through 6-behaviors.

Research on negotiation behavior has shown similarly varied results. In examining use of Integrative and Distributive behavior, Weingart, Prietula, Hyder, and Genovese (1999) found that negotiators only considered their own and the other party's previous behavior when deciding how to act. Similarly, in her association analysis of 15 labor negotiations, Koutsovoulou (2001) demonstrated clear antecedents and consequences of flexible and distributive behaviors, suggesting that the double-interact may be sufficient to organize the interaction process. In contrast, two studies have suggested that the triple-interact is central to the organization of interaction in conflict. Olekalns and Smith (2000) found that two 4-behavior sequences were necessary to model the interdependence in behavior of students negotiating a six issue bargaining problem. Similarly, in the absence of information about outcome and negotiator motive, Olekalns and Smith (2003) report that

a 3-behavior sequence did not adequately capture the variation in interaction, which suggests at least a 4-behavior sequence as necessary to model the dependencies among behaviors.

Given the mixed evidence regarding the length of sequence necessary to constrain negotiators' behavior, it seems unwarranted to propose an absolute length for all conflict interactions. However, it is possible to argue that the triple-interact (4-behavior sequence) will represent the upper-limit of any organization process in conflict negotiation. This sequence length represents an important boundary because it allows researchers to assess the extent to which other factors constrain the interaction process. For example, Olekalns and Smith (2003) found that differences in negotiators' social motive helped to reduce the sequence length required for constraint to that of the double-interact. Since a range of other factors may have similar roles in the interaction process, the triple-interact represents a "pure" conceptualization of constraint on which the impact of other factors can be assessed. Thus, it is predicted that:

H2:   The triple interact will predict negotiator behaviour with significantly less error than the double interact and smaller sequences.

The Role of Dispositions and Situations

Given that external factors will affect the extent of constraint across sequences, it is appropriate to identify the kinds of factors that are likely to be most influential. The dominant view of interpersonal dynamics is that individual differences among negotiators and the situations in which they interact are both factors that are central to the organization of behavior (Mintu-Wimsatt & Lozada, 1999; Shoda & Mischel, 1996). A negotiator is viewed as having a unique set of abilities, cognitive scripts, and behavior routines that come together to determine how he or she responds to the behavior of the other party. However, given the low levels of consistency in behavior across different situations (Mischel, 1968; Nisbett, 1980), these behavioral tendencies are proposed to be context specific, with negotiators exhibiting consistent but different responses to the other party's actions based on the psychological features of the situation. For example, a negotiator in the situation of an equal payoff-matrix may typically reciprocate integrative messages with integrative responses. However, the same negotiator in the lower position of an unequal payoff-matrix may respond to integrative messages with distributive strategies in an attempt to change the power structure.

This "interactionist" perspective implies that three factors will have an impact on the negotiation process. One factor is the scenario or context in which the interaction is embedded. Context can differ without any variation in the task structure or relational dynamics associated with the negotiation, and has been shown to influence the strategic choices that negotiators make (Deutsch, 1982; O'Connor, 1997). A second, more common, possibility is to find contextual differences subsumed by variations in the roles assumed by each negotiator (Rodham, 2000). Research has demonstrated some very consistent role effects, with hostage takers, buyers, union negotiators, and husbands all using more aggressive and power-oriented messages in comparison to their counterparts (Cai, Wilson, & Drake, 2000; Donohue, Diez, & Hamilton, 1984; Donohue & Roberto, 1993; Jones, 1989). Finally, set against the two features of the situation, research indicates that a variety of individual differences or variations in personality will influence how negotiators respond to the other party's behavior (De Dreu, Weingart, & Kwon, 2000; Kyl-Heku & Buss, 1996). Since individual differences may exist across similar negotiator roles, this final speaker factor would be expected to have its own unique impact on the interaction process. As a third assumption, therefore, researchers

should expect knowledge of context, negotiator role, and negotiators' individual differences to reduce the sequence of behaviours required to organise interaction. Thus, it is hypothesised that:

H3: Differences in context, negotiator role and negotiators' individual differences will each significantly reduce the error associated with predicting negotiators' behaviour.

The Relative Value of Previous Behavior, Disposition and Situation

According to the interactionist perspective, then, speaker-situation relations are central to how negotiators organize their responses to the other party. This, interestingly, is somewhat in contrast to the interact-based approach to understanding conflict, which views the contribution of contextual and dispositional factors as secondary to the impact of previous behaviours on negotiators' behaviour. For the interact-based approach, there is considerable consistency in the way negotiators respond to sequences of behaviors, with dispositional and contextual factors playing an indirect role, influencing only negotiator's repertoire of responses and the sequences to which he or she is exposed.

There exists some support for this final proposition (Auld & White, 1959; Gouran & Baird, 1972; Penman, 1980). For example, in their analysis of the interaction within University committees, Donohue, Hawes, and Mabee (1981) found that differences among groups accounted for 5% of the uncertainty in behavior, compared to the 21% accounted for by the preceding event. Since group differences incorporate variations in context, role, and speaker, these findings suggest that the immediately preceding behavior alone may have a larger influence on the organization process than the sum of individual differences. In relation to negotiation, Koutsovoulou (2001) found that the systematic use of double-interacts by negotiators was not significantly influenced by whether the interaction was an industrial or company labor disputes. Similarly, Weingart et al. (1999) found that knowledge of bargaining dynamics only had a significant effect on behavior when associated with a particular sequence of prior behaviors. This finding suggests that individual differences in knowledge act as a moderator of the way negotiators' respond to previous behaviors, which is consistent with research that has found important patterns in the sequences of behavior while holding constant factors such as negotiators' social motives, time period, and outcome (Olekalns & Smith, 2000; Olekalns & Smith 2003).

H4: Previous behaviors will be a better predictor of negotiators' future behavior than differences in context, role, or individual differences.

METHOD

Conflict Negotiation Sample

In order to test the hypotheses, data were drawn from two contrasting types of crisis negotiation: hostage and divorce mediation.

Hostage Negotiations. These data were transcripts of negotiations across nine real hostage incidents, collected from the archives of various U.S. police forces. The transcripts contained over 19,467 thought units spoken mainly by the hostage taker (46%) and police negotiator (43%) involved in the incident, but also by third parties such as friends or relatives (11%). The transcripts represented a diverse group of hostage crises, from incidents in which an individual negotiates to

extort money or gain some other substantive benefit to those centered on psychological or domestic issues where a personal cause is the central concern. This range of settings was sufficiently broad to embody what previous research has shown reflects police officers' perceptions regarding the distinguishing goals and orientations of hostage takers (Donohue & Roberto, 1993). The data have been used in previous research (Donohue & Roberto, 1993; Taylor, 2002a).

Divorce Mediations. This data sample consisted of transcripts from 20 divorce mediation sessions conducted in various branches of the Los Angeles County Family Mediation and Conciliation Court. The data were selected from a larger set of recorded sessions (Pearson & Thoenness, 1985) on the basis that the sessions focused on issues relating to a mutual son or daughter and that they did not involve dialogue from individuals other than the father, mother, and mediator (e.g., attorneys). Although the impact of these factors is important, they are likely to produce sessions whose dynamics are very different from those found between ex-partners such that including them will serve only to reduce the clarity of analysis. The sessions involved 17,450 thought units that were divided evenly between husband (38%), mediator (31%) and wife (31%). The data have been used in previous research (Donohue, 1991).

Transcript Coding Procedure

The transcripts were coded by dividing each speaking turn into thought units and then coding each of the thought units as one of nine behavioral types. The resulting sequences of behavior were analyzed using several approaches that differed in the way they weighted the connections among thought units found within and between utterances. The procedure is described below.

Partitioning into Thought Units. The transcripts were divided into thought units (Gottman, 1979) to enable the subsequent coding to capture the use of single behaviors. A thought unit conceptually relates to a complete idea that a speaker wishes to express and occurs in actual speech as an independent clause with a subject and an object (e.g., "I want to get out of here"). Coding at this level therefore comes closest to isolating single communication acts and so minimizes the possibility of analysis overlooking smaller but psychologically meaningful components of dialogue. The unitizing reliability was assessed by having two coders that were experienced in parsing dialogue unitize approximately 10% of both the hostage and divorce transcripts. For the hostage dialogue, the coders agreed on the placement of 95% of the thought units and achieved a unitizing reliability of .04 (Guetzkow, 1950). For the divorce mediation dialogue, the coders agreed on placement of 96% of the thought units and achieved a unitising reliability of .02. Thus, approximately 3% of the unitizing divisions were in error. All errors in unitizing were addressed before the transcripts were coded.

Coding of Thought Units. The nine modes of interaction identified in Taylor (2002a) were used as categories for coding each thought unit. These categories are shown in Table 1 together with an example. The categories distinguish two important facets of interpersonal behavior during conflict. The first distinction, central to wide range of classification schemes (Sillars, Coletti, Parry, & Rogers, 1982), is between Avoidance (withdrawal), Distributive, (antagonistic) and Integrative (cooperative) behavior. This distinction reflects negotiators' overall approach or orientation to interaction and spans from a low-rationality crisis response through to a more normative, cooperative mentality. The second distinction reflects the three dominant motivational goals or concerns that negotiators can pursue during a negotiation. Behaviors are classified as Identity, Instrumental, or Relational depending on whether they emphasize substantive issues, the personal and social identity

Table 1
Coding Categories Together with Examples.

Coding Category	Transcript Example
Avoidance-Identity	"I didn't say that"
Avoidance-Instrumental	"I don't know if they'll let me do it."
Avoidance-Relational	"I don't really care"
Distributive-Identity	"You sound a bit immature to me"
Distributive-Instrumental	"I will not make any more concession today."
Distributive-Relational	"You're not showing any good faith here."
Integrative-Identity	"I understand the fact that you're very intelligent, and I appreciate that."
Integrative-Instrumental	"I'm going to let you get Tracey."
Integrative-Relational	"I think you guys have something in common there"

of the negotiators, or the degree of affiliation and interdependence among the negotiators (Donohue, 1998; Hammer, 2001; Roloff, 1981). Since negotiators can potentially communicate about each of the issues using an Avoidance, Distributive or Integrative approach, the two distinctions combine to form the nine categories shown in Table 1. For example, a negotiator focusing on Identity issues may adopt an Integrative orientation by communicating messages that support and empathize with the other, but they may also take a Distributive approach by using criticisms and insults. The coding scheme therefore captures differences in a negotiator's dominant interpersonal style and, at a more specific level, their predominant interests and concerns during that particular period of interaction.

The coding scheme was applied to each thought unit as it occurred in the sequential flow of dialogue. During the coding, a fifth Functional category was used to capture those aspects of dialogue that contain no objective psychological information and act as the building blocks of interaction. These included explicative acknowledgements or interjections (e.g., "uh-huh"), initiations and salutations (e.g., "bye-bye"), and questions or answers that facilitated either conversational turn taking (e.g., "nah, really?") or basic information exchange (e.g., "could you say that again?"). However, in accordance with previous work (Donohue & Roberto, 1996; Olekalns & Smith, 2000), these thought units were excluded from subsequent analysis because their role in shaping negotiation is not well understood and is most likely to be indirect. The inclusion of these units is likely to reduce the ability of analysis to identify the organization of communication behavior as the negotiation unfolds.

Reliability of the coding was assessed by having one rater code approximately 5% of the thought units from the hostage negotiations, and a second rater code approximately 5% of the thought units from the divorce mediations. Agreement with the first author's coding, measured using Cohen's Kappa (Cohen, 1960), was .73 (Range .63 to .81) with 76% agreement for the hostage data and .74 (Range .65 to .80) with 75% agreement for the divorce mediation data. Inter-judge coding achieved a reliability of .77 (Range .69 to .85) with 80% agreement. According to Fleiss (1981), a Cohen's Kappa between .60 to .75 indicates a good level of coding reliability.

Analysis of Sequences

The coding procedure produced a sequence of coded thought units for each of the 29 transcripts. These sequences were analyzed using three approaches that made different assumptions about the organization of interaction. Since the aim of the research was to test general hypotheses

about the negotiation process, examining the sequences from several different perspectives may give a better indication of the extent to which the findings represent general principals that transcend the different ways of conceptualizing interaction sequences.

The first approach used the complete sequences as a representation of interaction. If a speaker used more than one thought unit in a single utterance, then each of these units was included in the data sequence. Consequently, sequences of two, three, or more thought units could contain the behaviors of just one speaker or the interaction between speakers. The merit of this inclusive approach is the recognition that all thought units may potentially have a role in shaping the way a negotiation unfolds. This is important given researchers' current inability to say which thought units of an utterance are central to moving the negotiation in certain directions. However, this advantage is offset by the possibility of sequences containing different combinations of each speaker's behaviour, which results in the interaction between speakers being measured inconsistently across different sequences. Specifically, the process of interaction among negotiators (i.e., a cue-response-cue…) is ignored within this approach because it focuses on a sequence of thought units rather than a sequence of interconnected messages communicated by an utterance of thought units. The result is that negotiators' may constrain their own behaviour in isolation from the other speaker, and may be found to act "independently" of the other party solely because they use more thought units to express their message.

The second approach included only the first thought unit of each utterance in the sequences. This "hitting behavior" approach (Weingart et al., 1999) reduced the data into "clean" sequences of behavior in the sense that a single thought unit represented each speaker's message. This approach considers the first behavior as key to understanding an utterance, with subsequent behaviors working only to elaborate and refine the message provided in the first unit. Because negotiators' behaviour is represented by one unit, this approach provides a consistent conceptualisation of the cues and responses of negotiators in a way that allows the mutual constrain of each to be analysed effectively. However, the approach achieves this clean representation of interaction by ignoring completely the way negotiators' organise an utterance to have a particular impact. This "internal" process is important to the way a negotiation unfolds (Donohue, Diez, & Hamilton, 1984)

The final approach stems from arguments that utterances should be coded as both a response to the prior utterance and as a cue or attempt to structure the subsequent utterance (Donohue, Diez, & Hamilton, 1984; Olekalns & Smith, 2000). For this approach, the first thought unit of an utterance was taken as the speakers' response to the previous utterance, while the final thought unit of an utterance was taken as the speakers cue for the other party. By representing each utterance twice, this approach produced sequences that allowed the impact of negotiators' behavior on the other party to be assessed. However, by coding the beginning and the end of each utterance, this approach also provided some measure of the internal structure of a negotiator's message. This approach therefore considers both the way negotiators' organize their own messages and the interdependence among negotiators' messages as important to the interaction process.

RESULTS

In keeping with the focus of this special issue and to conserve space, the analyses presented here were computed from data coded using the third interaction approach. This approach provided the useful compromise of capturing within-negotiator and between-negotiator message organisation in a way that was consistent across utterances and, consequently, effectively handled by analytical

techniques. Furthermore, since the average number of thought units per utterance was 2.51 (SD = 2.73, Range 1 – 74) for the hostage negotiation data and 2.78 (SD = 3.51, Range 1 – 54) for the divorce mediation data, the number of thought units ignored by using this approach was typically less than one per utterance. Coding each utterance as a cue and response was therefore sufficient to capture the way negotiators developed the majority of utterances. However, results from all three methods of coding showed remarkably similar patterns, and equivalent analyses of data coded using the other two approaches are available from the authors on request.

Hypothesis 1: Canalizing of Behavior

Figure 1 plots the mean proportion of different occurring sequences for lengths of 1 behavior through to 7 behaviors. As a prerequisite to testing Hypothesis 1, it is necessary to test whether the available data is sufficient to have enabled further sequences to be observed if negotiators used them. If the number of different sequences used comes close to the number that would be observed if each sequence was unique, then the problem arises that further alternative sequences might have occurred given more data (i.e., ceiling effects). To check for this possibility, the number of different sequences in each transcript was considered as a proportion of the number that would have been observed if every sequence in the transcript was different. For example, an average of 487.5 different 2-behaviours sequences could have occurred across the 29 transcripts, but only an average of 118.5 were actually observed. Therefore, about 24% of the 2-behaviour sequences in each of the transcripts were unique (i.e., 118.5 ÷ 487.5 = .24). The mean proportion of unique sequences across each transcript is given for each of the sequence lengths by the dotted line emanating from the bottom of Figure 1. This proportion falls safely below the potential maximum number until sequences involve more than 5 behaviors. Specifically, sequences of 6 behaviors are unique in 96% of the
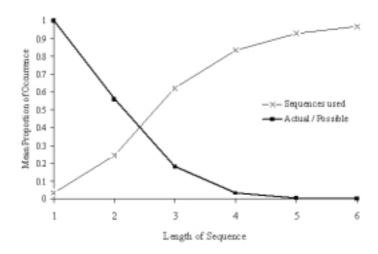

FIGURE 1
Mean Proportion of Different Sequences Used Relative to Different Sequences
Possible as a Function of Sequence Length.

observed sequences, while sequences of 7 behaviors are unique in 98% of the observed sequences. An indication of whether the change in variety comes from natural constraint or ceiling effects was obtained by testing the significance of the increase in variety at adjacent sequence lengths. The increase in mean occurrences across sequence length was significant, $F(6,399) = 36.0$, $p < .05$, $\mu^2 = .35$, with post-hoc Bonferroni t-tests indicating significant increases in mean occurrence between 1-behavior and 2-behavior sequences ($t = 9.5$, df = 114, $p < .05$) and 2-behavior and 3-behavior sequences ($t = 6.4$, df = 114, $p < .05$), but no significant differences in mean occurrences between adjacent sequences of larger lengths. Since the natural constraint in the number of sequences used occurs before the problematic sequences of 6 and 7 behaviors, the data would seem to give a reliable representation of behavior use for this study.

The solid line in Figure 1 plots the mean number of different sequences as a proportion of the number of theoretically possible sequences at each sequence length. For example, there are 9 different possible 1-behaviour sequences (i.e., the 9 codes) and negotiators used each of them. In contrast, there are 81 different possible 2-behaviour sequences (i.e., 9 behaviours x 9 behaviours), but only an average of 56% of these combinations actually occurred within the interactions. More generally, as can be seen in Figure 1, the actual number of different responses used compared to those that are possible decreases rapidly with increasing sequence length. Specifically, sequences of three behaviors involve 18% of the possible sequences, while sequence of 4 behaviors use only 3% of the possible combinations. This rapid decrease in the proportion of behavioral combinations used by negotiators gives strong support to the hypothesized channeling in behavior with increasing sequence length.

Hypothesis 2: The Extent of Constraint

Figure 2 shows the mean number of different behaviors used as a response to a particular sequence of cues and responses, for both the hostage and divorce negotiations. The mean number of exits can range from 9, indicating all behaviors follow a particular sequence, to 1, indicating that only one behavior follows a given sequence (i.e., perfect predictability). As can be seen on Figure 2, the mean number of exits used following a cue falls below the possible 9, suggesting that certain cues generally elicit certain responses. More importantly, the number of different exits used by negotiators declined rapidly with increasing sequence length. At the point of three preceding behaviors the line shows some indications of leveling off (i.e., the "elbow"), providing initial evidence that the triple-interact (i.e., cue-response-cue-response) plays an important role in organizing the interaction process. Specifically, on average, the same three previous behaviours elicited a mean of 1.2 (SD = .48) different responses in hostage negotiations and 1.7 (SD = 1.1) different responses in divorce mediations. The constantly higher number of exits associated with divorce mediations compared to hostage negotiations suggests that divorce mediations typically involve greater variety and flexibility in the interaction process. Part of this flexibility may be the result of divorce negotiations involving three major participants (i.e., wife, husband, and mediator) rather than the two participants involved in hostage negotiations (i.e., police negotiator and hostage taker) (Stech, 1975).

In order to provide a more detailed analysis of how previous behaviors contribute to the interaction process, it is necessary to turn to a quantitative analysis of the sequences. Information theory (Shannon & Weaver, 1949) provides a useful methodology for examining the contribution of different variables to a single process because it provides estimates of each variable's relative impact on negotiators' use of behaviors. Information theory simply examines the extent to which each of the
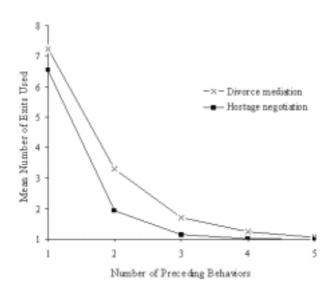
FIGURE 2.
Number of Different Exits Used Across Speakers as a Function of Sequence Length.

examined variables allows subsequent behavior to be predicted accurately. This is achieved through a measure of uncertainty, H(X), which quantifies the number of yes-no questions required to accurately predict the subsequent behavior. One unit of uncertainty is equivalent to the amount of information required in choosing between two equiprobable alternatives, while a choice between four equiprobable events would require two units of information. However, because communication behaviors rarely occur with equal frequency, the degree of uncertainty in a particular condition takes into account the probability with which a particular predictor is associated with a given behavioral response. In a situation where one event is relatively highly probable, H(X) will be lower than if the events were more nearly equally probable. In a situation where a negotiator always sends the same message, such that there is no uncertainty about their behavior, then H(X) will equal zero. By comparing the average uncertainty H(X) with and without knowledge of a particular variable, it is possible to estimate how much each variable contributes to the organization of the interaction process. The larger the reduction in H(X) following introduction of a variable, the more that variable influences negotiators' choice of communication behavior. For details of the mathematics used to calculate H(X) and make comparisons, see Attneave (1959), Chaffee and Wilson (1977), Chatfield and Lemon (1970), and McCowan, Hanser, and Doyle (1999).

For the current analysis, in which there are 9 different possible behaviors, H(X) cannot exceed 3.17 units, the value which represents the upper limit of the uncertainty and is achieved only if all 9 behaviors occur with equal probability. As would be expected, this is not the case with negotiation behavior. The uncertainty associated with cues, H(cues) = 2.99, and responses, H(response) = 3.04, falls below the maximum H(X), indicating that, negotiators use some behaviors more often than other behaviors. The discrepancy in H(cues) and H(responses) suggests a slightly higher degree of homogeneity in negotiators' use of cues compared to responses. This bias in the probability of pre-

dicting cues and responses makes it necessary to separately consider the effect of variables on the organization of cues and responses.

The measure of uncertainty H(X) was calculated from the relevant marginal frequencies for up to five previous utterances, as well as for negotiation context, negotiator role, and speaker. These are reported in Table 2 for predicting cues and Table 3 for predicting responses. Each row of these Tables considers the reduction in uncertainty provided by a group of predictors (excluding the behaviour to be predicted), with predictors being systematically added with movement down the Tables. In order to assess the importance of the predictors to the organization of interaction, the Tables report the amount and proportion of reduction in uncertainty provided by the considered set of variables. This value, often known as Transmission (T), reflects the difference between uncertainty in behavior given no predictors and the reduced uncertainty given the group of predictors. The Tables also report a transmission value for the differences in uncertainty between a predictor group and the prior group, thereby giving an indication of the contribution made by the additional variable. In both cases, the higher the transmission value the greater the influence of the predictor group on the interaction process.

The first half of Table 2 and Table 3 report the reduction in uncertainty associated with knowledge of previous behaviors within the interaction. Each row of these Tables considers the impact of either alternate speaker's previous responses on the current response (Table 2) or alternate speaker's previous cues on the current cue (Table 3). However, by focusing on these uncertainty values, the

Table 2
Uncertainty Values and Contributions to Predicting Cue Behavior for
Past Behaviors, Context, Negotiator Role, and Speaker.

Predictor	Uncertainty (H)	Reduction in Uncertainty	
		Overall	Added variable
(None)	2.99		
Cue(C)response(r)	2.83	0.16	.155
		(.052)	(.052)
Cr.Cr	1.89	1.10	.940
		(.366)	(.315)
Cr.Cr.Cr	0.64	2.35	1.26
		(.787)	(.420)
Cr.Cr.Cr.Cr	0.11	2.88	.525
		(.963)	(.176)
Cr.Cr.Cr.Cr.Cr	0.01	2.97	.098
		(.995)	(.033)
Cr.Cr.Cr.Cr.Cr.Cr	0.00	2.98	0.01
		(.999)	(.004)
Context	2.97	0.02	.021
		(.007)	(.007)
Context.Role	2.86	0.13	.107
		(.043)	(.036)
Context.Role.Speaker	2.67	0.32	.192
		(.107)	(.064)

Notes: Numbers in parentheses are standardized values.
    C = between-speaker cues; r = within-speaker responses.

Table 3
Uncertainty Values and Contributions to Predicting Response Behavior
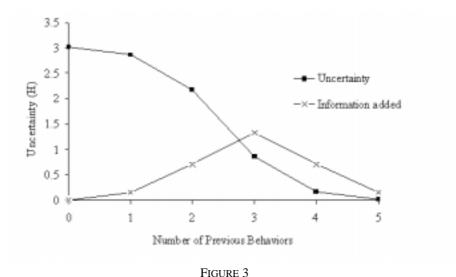**for Past Behaviors, Context, Negotiator Role, and Speaker.**

Predictor	Uncertainty (H)	Reduction in Uncertainty	
		Overall	Added variable
(None)	3.04		
Cue	2.90	0.14	.136
		(.045)	(.045)
C.rC	2.45	0.59	.456
		(.195)	(.150)
C.rC.rC	1.08	1.96	1.37
		(.646)	(.451)
C.rC.rC.rC	0.22	2.82	.860
		(.929)	(.283)
C.rC.rC.rC.rC	0.03	3.01	.187
		(.991)	(.062)
C.rC.rC.rC.rC.rC	0.00	3.04	.025
		(.999)	(.008)
Context	3.03	0.02	.015
		(.005)	(.005)
Context.Role	2.93	0.11	.099
		(.037)	(.033)
Context.Role.Speaker	2.74	0.30	.184
		(.098)	(.060)

Notes: Numbers in parentheses are standardized values.
C = between-speaker cues; r = within-speaker responses.

Tables also incorporate the reduction in uncertainty produced by within-speaker structuring of the interaction. For example, the predictor Cue(C)response(r) in the second row of Table 2 reports the uncertainty of predicting one speaker's cue based on the cue of the other speaker and the first speaker's response to that cue. Given the unique impact that within-speaker dialogue may have on the channeling processes, it was important to consider both of these behaviors as predictors when calculating uncertainty. The result of doing so was that each Table row shows both the within- and between-speaker constraint produced by an additional utterance.

The contributions of additional variables to the uncertainty in the interaction is shown graphically in Figure 3, which plots H(X) and the contribution of each variable as an average taken across cues and responses. As can be seen from the descending curve in Figure 3, as well as the associated values in Tables 2 and 3, the uncertainty of negotiators' future behaviors reduces as more previous behaviors are considered. At the point of considering six previous utterances, a negotiators' subsequent cue or response is over 99% predictable for both cues and responses. In contrast, the preceding behavior within a sequence makes only a small contribution to the organization of behavior. Consistent with Hypothesis 2, a significant majority of the channeling in behavior transpires during 3-behavior (double-interact) and 4-behavior (triple-interact) sequences, as shown by the sharper gradient of the curve.

FIGURE 3

Uncertainty (H) and Amount of Information (predictability) Added as a Function of Sequence Length.

The relative importance of these behavioral sequences in organizing interaction may be assessed by comparing the reduction in uncertainty achieved by adding an additional predictor. The values in the final column of Table 2 and Table 3 reflect the reduction in uncertainty achieved by adding a further variable to the sequence length, and so enables comparisons of the relative contributions made by each variable as sequence length increases. Figure 3 shows the impact of each additional variable taken as an average across cues and responses. As can be seen on Figure 3, the influence of previous behaviors rises to a sequence length of four (i.e., the triple-interact), beyond which the relative contribution of additional behaviors begins to decrease. Indeed, adding a fourth behavior to a complete sequence reduces uncertainty by 1.26 (42%) in cues and 1.37 (45%) in responses, which is by far the largest reduction.

Hypotheses 3: The Contribution of Disposition and Situation Factors

The second part of Table 2 and Table 3 considers how differences among negotiators and negotiation contexts affect behavior use. As can be seen in Table 2, there is very little difference in the use of cues between actual negotiations and divorce mediations, H(none) – H(context) = 0.02. Far more variance in behavior was associated with differences among negotiators. Specifically, the contribution of role to the prediction of behavior was about 3.5%, while individual differences beyond role reduced uncertainty by approximately 6.5%. The overall reduction in uncertainty of 0.32 (11%) represents the combined contribution of context, role and speaker to the organization of behavior. An almost identical pattern is evident for the prediction of responses, with slightly lower H(X) values occurring due to the initial relative uncertainty associated with responses compared to cues. Both context and role contribute even less to the prediction of responses (i.e., .11 compared to .13), but this is compensated by a slightly larger contribution of speaker differences to the way negotiators respond (.18). Thus, situation accounts for less than 1% of the variation in negotiators' responses, role accounts for 3%, and individual differences beyond role account for 6% of the uncertainty in behavior.

Hypothesis 4: The Relative Value of Previous Behavior, Disposition and Situation

Comparisons among the top and bottom sections of Table 2 and Table 3 permit an evaluation of the relative contributions of previous behaviors, context, and individual differences to the organization of the interaction process. Table 2 indicates that the reduction in uncertainty provided by knowledge of context (less than 1%) is small compared to the contribution of other predictors. For example, knowledge of either negotiator role, their individual differences beyond role, or the previous behavior reduces uncertainty of the next cue by about 5%. Combining knowledge of context, role and speaker enables a reduction of uncertainty to just below 11% of the variation in behavior. However, the importance of context and individual differences in organizing negotiators use of cues is small when compared to that of previous behaviors. In particular, adding a third behavior to the sequence of predictors reduces uncertainty by 42%, almost 4.5 times that of knowledge about individual differences and context. The complete triple-interact (i.e., all three behaviors) reduces uncertainty by almost 80%.

A similar pattern of influence is evident for the prediction of responses (Table 3) but for the fact that cues are relatively more important in organizing the interaction sequence than responses. In particular, knowledge of the previous cue accounts for approximately 4.5% of the variation in behavior, which compares to a 3% reduction that comes from knowledge of context and role. Speaker differences play a more prominent role in predicting responses, with knowledge of speaker alone reducing uncertainly slightly more than knowledge of the preceding behavior (i.e., .06 compared to .05). However, as with the organization of responses, knowledge of context, role and speaker account for almost 10% of uncertainty in behavior, which again looks small when compared to the 65% provided by the triple-interact.

DISCUSSION

Research into the process of interaction during conflict negotiation rests on a number of implied, but largely untested foundations regarding the organization of behavior over time. This paper explicated these principles and tested them in the patterns of behavior that occurred during two types of conflict negotiation. Regardless of the contextual and individual differences associated with the interaction, negotiators' were found to use only a small proportion of their possible cues and responses when reacting to the other party's behavior. Of particular importance was the triple-interact, which represented the point at which a sequence of behaviors had served the majority of its function in terms of advancing the negotiation. The important role of preceding behaviors in shaping negotiation was further highlighted when compared against the effect of situational and individual differences, which had relatively little impact on the paths of behaviors pursued by negotiators.

The evident influence of previous messages on negotiators' current behavior demonstrates the important role that local interaction-based dynamics play in structuring the progress and outcome of a negotiation. Consistent with previous research, negotiators were shown to be systematic in their use of dialogue, with responses to particular messages determined or organized by the string of previous utterances. At this level, negotiators are clearly interdependent, with their own and the other party's messages jointly shaping the focus on interaction and the strategic path that is pursued. In other words, as negotiators respond to previous behaviors they seek to change the dynamics of the interaction on a number of dimensions, with some behaviors serving to organize particular dynamics while others serve to shape the process on a number of levels (Taylor, 2002a).

One major implication of the findings was to assert the triple-interact as an essential unit in the organization of dialogue during conflict. Specifically, the triple-interact (e.g., cue-response-cue-response) represented the point at which a particular behavioral sequence had served the majority of its function in moving the interaction forward. In other words, the triple-interact denotes the cognitive frame (Goffman, 1967) or social memory (Altmann, 1965) of conflict negotiation, with behaviors within this "window" of interaction directly constraining a negotiator's current behavior. Although taking account of additional previous behaviors may indirectly constrain the current behavior, these have more bearing on the subsequent behaviors within the interaction. The notion that a single behavior impacts on past, current, and future triple-interacts demonstrates how each sequence links with the next to form the dynamic, unfolding interaction observed during conflict.

Given the triple-interact as a major building block of interaction, the question arises as to what this unit represents within the negotiation process? One compelling answer is that the triple-interact reflects an instance of negotiators implementing and responding to an individual "strategy". For example, the triple-interact may consist of short sequences of reciprocation that either builds interdependence and affiliation or attempt to move the other party's position towards a personal goal (Donohue, 1981; Putnam, 1990). Other sequences may combine cooperative and competitive behaviors as a way of shifting away from a spiraling conflict or as a way of exploiting an unwary opponent (Olekalns & Smith, 2000; Pruitt & Carnevale, 1993). It is important to note in this regard that previous research has largely focused on 2-behavior sequences, but that the current findings suggest these units are actually part of larger more elaborate strategies. Such strategies may reflect the continual interplay between substantive and relational levels of dialogue, with particular components (e.g., thought units) of the strategy focusing on one or both of these dynamics. More importantly, the findings suggested that dispositional and contextual factors may play a role in reducing the number and type of sequences used by negotiators. Both negotiator role and individual differences were found to reduce the uncertainty of negotiators' future behavior, suggesting that these factors may have systematic and predictable effects on the content of triple-interacts as well as when they are used.

The finding that context and dispositions play a small role in determining negotiators' communication behavior may come as no surprise to conflict scholars as it is consistent with previous research (e.g., Olekalns & Smith, 2003). However, it is less appreciated by psychologists who have traditionally considered the interaction between person and context as the main determinant of individuals' tendency to act in particular ways (Mintu-Wimsatt & Lozada, 1999; Shoda & Mischel, 1996). The relatively minor role of person and context in comparison to previous behaviours raises the possibility that negotiators have set responses to different behavioural sequences that they employ consistently irrespective of the context and their negotiation role. In other words, negotiators develop a set repertoire of responses to behavioural sequences that may be generic enough to be useable over a range of different interactions, with individual differences emerging only in the composition of the repertoire (i.e., the responses that a negotiator gives to a particular sequence). This perspective is not inconsistent with existing evidence of cross-situational variability (Shoda, Mischel, & Wright, 1993**AU:PLS CITE**), which may be reinterpreted parsimoniously as the oversight of not considering differences in sequences of previous behaviours and how these shape negotiators' responses.

Although this paper presented an analysis in which each utterance was coded as both a cue and a response (Donohue, Diez, & Hamilton, 1984), results from analyses using other methods of coding the utterances produced comparable support for the hypotheses. Regularities that transcend the

method of coding used are likely to represent some basic principles that form the foundation of a general theory of the negotiation process (Taylor, 2002b). On the basis of previous findings and those of this study, it seems reasonable to assert that one regularity is that negotiators' behavior is constrained by their own and the other party's behavior over time. Moreover, since this narrowing of options occurs predominantly within the triple-interact (i.e., 4-behavior sequence), it is likely that further consistencies and regularities will emerge in such short sequences of behavior. As additional strategies are identified, so research will gain a better understanding of the organization of behavior that governs the interaction process. By then learning how these strategies come together, as well as how the process is affected by dispositional and contextual factors, researchers will be able to move towards uncovering how the interaction process produces the dynamic patterns observed across interpersonal dimensions over time.

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