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Linguistic Style Matching and Negotiation Outcome

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Abstract

This research examined the relationship between Linguistic Style Matching—the degree to which negotiators coordinate their word use—and negotiation outcome. Nine hostage negotiations were divided into 6 time stages and the dialogue of police negotiators and hostage takers analyzed across 18 linguistic categories. Correlational analyses showed that successful negotiations were associated with higher aggregate levels of Linguistic Style Matching (LSM) than unsuccessful negotiations. This result was due to dramatic fluctuations of LSM during unsuccessful negotiations, with negotiators unable to maintain the constant levels of rapport and coordination that occurred in successful negotiations. A further analysis of LSM at the local turn-by-turn level revealed complex but organized variations in behavior across outcome. In comparison to unsuccessful negotiations, the dialogue of successful negotiations involved greater coordination of turn taking, reciprocation of positive affect, a focus on the present rather than the past, and a focus on alternatives rather than on competition.

Linguistic Style Matching and Negotiation Outcome

Conflict researchers have long been interested in uncovering the communicative dynamics that determine whether or not a negotiation is successful. This interest has particular prominence in crisis negotiation research, where outcome has been shown to relate to differences in relational dynamics (Donohue & Roberto, 1993), behavioral competitiveness (Taylor, 2002a), the reciprocation of offers and arguments (Giebels & Taylor, in press), and many other facets of the interpersonal process. However, to date, research in crisis negotiation has given almost no consideration to the importance of language use. This oversight is significant, not least because the words and phrases that speakers use to negotiate a crisis represent the channel through which instrumental and relational dynamics are played out. Understanding how language use shapes the development of a negotiation is therefore likely to provide significant insights into the interpersonal dynamics of conflict. This paper focuses on one aspect of language use known as linguistic style matching, and considers its role in determining how crisis negotiations unfold and resolve.

Linguistic Style Matching (LSM)

When two people interact, their utterances are patterned and coordinated, with each individual's cues and responses fitting into a sequence of interconnected events (Auld & White, 1959; Putnam, 1985). In the nonverbal literature, this coordination of actions is considered essential to interaction success. Facial expressions, non-verbal behaviors, kinetics and proxemics have each been shown to coordinate in systematic and organized ways to enhance the communication process (Ellis & Beattie, 1986). The same is true in the communication literature. According to Giles's Communication

Accommodation Theory (Giles & Coupland, 1991), individuals continually adapt their communication behavior to create, maintain or decrease the social distance between themselves and the other party. One strategy that reduces social distance is convergence, which involves an individual adapting his or her use of gestures, idioms, and behavioral strategies so that they become more similar to those used by the other party. This occurs, for example, in criminal trials, where witnesses adjust the type of answer that they provide in order to accommodate to more and less coercive questioning by the lawyer (Gnisci, 2005). Finally, the concept of coordination is evident in negotiation theory. Coordination of behavior is posited as central to macro level constructs such as role complementarity (Donohue, 2001), and to micro level processes such as the mechanism that constrains negotiators' response to the other party's cue (Olekalns, Brett, & Weingart, 2003; Taylor & Donald, 2003).

More recently, the concept of coordination has been considered at the level of language or linguistic style. Niederhoffer and Pennebaker (2002), in particular, propose a coordination-engagement hypothesis that predicts high coordination, or high Linguistic Style Matching (LSM), as people become actively engaged with one another in the interaction. This hypothesis rests on the notion that individuals' use of words and phrases reflects their global perception of a situation and their explicit concerns and goals at any moment in time (Niederhoffer & Pennebaker, 2002; Taylor, 2002b). It proposes that people matched in their linguistic styles—in their linguistic presentation of ideas and arguments—are likely to possess a degree of harmony in the ways they perceive the situation and its potential solutions. In negotiation terms, the extent to which negotiators

match one another's linguistic style might provide a useful index of agreement, and may be systematically related to negotiation outcome.

Linguistic Style Matching (LSM) and Negotiation Outcome

Niederhoffer and Pennebaker (2002) directly consider the relationship between Linguistic Style Matching (LSM) and interaction outcome. In three studies that examine both student interactions and real world dialogue (interactions between President Nixon and his aids), they investigated the relationship between synchrony in speakers' language and several measures of interaction quality. They compared speakers' scores over 18 linguistic dimensions of language and found that, in all cases, dyads exhibit significant LSM on both a broad conversational level and a turn-by-turn level. However, in the case of the real world dialogue, the extent of verbal matching associated negatively with known facts about both the relationship between the two speakers and the final resolution. Specifically, in their analysis of the final conversations between Nixon and Dean (when tensions and suspicions were high), both speakers showed poor coordination of interaction, a desire to dominate the interaction, and little synchrony in their cognitive approach to the problem.

This finding is generally consistent with the results of research on crisis negotiation. Both empirical research and negotiators' personal accounts concur that successful negotiations begin with the development of rapport and trust. Rapport allows negotiators to build a common framing and understanding of the conflict, which in turn allows them to jointly move towards problem solving and a resolution (Cambria, DeFilippo, Louden, & McGowan, 2002; Donohue, Ramesh, Kaufman, & Smith, 1991; Taylor, 2002b). Relational Order Theory (Donohue, 2001) is particularly explicit about

this process, arguing that the most effective interaction occurs when negotiators establish high levels of affiliation and interdependence. These dynamics occur in dialogue as synchronized turn taking, mutual reciprocation of the other's focus, and general verbal complementarity.

A second line of support for the link between LSM and negotiation success comes from evidence showing that police negotiators can promote "entrainment" by adopting the same motivational focus as the hostage taker (Taylor, 2002b; Taylor & Donald, 2004). Entrainment is a process whereby subsequent changes in personal dialogue are mirrored by equivalent changes in the other party's dialogue (McGrath & Kelly, 1986). This evidence, which is consistent with Van Swol's (2003) finding that nonverbal mirroring increases persuasiveness, provides a theoretical explanation for why high levels of LSM might be linked with greater cooperation and movement towards a successful (i.e., non-violent) resolution of a crisis. High LSM is a corollary of negotiators framing the conflict and its potential solutions in a mutually agreed way. As such, it allows differences to be overcome and solutions to be reached.

Turn-by-Turn LSM and Negotiation Outcome

The proposed association between negotiation success and high LSM raises the question of how negotiators coordinate their language use and, in particular, whether coordination occurs at the basic level of speaking turn. At least two concepts from the literature on human interaction suggest that negotiators may indeed adapt their responses to match the language of the other party's cue; that of mimicry (e.g., Chartrand & Bargh, 1999) and limitation (Watzlawick, Beavin, & Jackson, 1968, p. 131). Central to both of these concepts is the observation that one speaker's cue reduces the possible ways in

which a second speaker can respond, and that one common outcome of this channeling is a mimicking or matching response (Smith, Pruitt, & Carnevale, 1982; cf. "response-in-kind", Weingart, Prietula, Hyder, & Genovese, 1999). In their analysis of linguistic style matching, Niederhoffer and Pennebaker found that such mimicking of previous behavior applied to speakers' word use. Aspects of a responder's linguistic style was found to correlate significantly with characteristics of the sender's message, thereby suggesting that linguistic style matching may be evident in the cue-response dynamics of negotiators' interaction.

The impact of turn-by-turn dynamics on the quality of an interaction, as well as its final outcome, has been the focus of research in a number of contexts. For example, recent experimental work has shown that high verbal mimicry correlates positively with better negotiation outcomes, at least for the person who engages in mimicry (Curhan & Pentland, 2007; Maddux, Mullen, & Galinsky, 2008). Similarly, in his examination of military base rights negotiations, Druckman (1986) found that matched use of hard verbal tactics by the Spanish and US delegations correlated with positive turning points in the interaction. Conversely, the larger the difference in the delegations' use of hard tactics at any one time, the more likely a crisis would follow in the interaction. Finally, in the hostage negotiation context, Ormerod, Barrett, and Taylor (in press) have shown that being able to maintain equivalently framed utterances (as measured by language characteristics) is linked to success, with successful negotiations associated with longer periods of synchronous framing compared to unsuccessful negotiations. Interestingly, this study highlights the importance of considering the role each negotiator takes in determining and sustaining the synchronous passage. On some occasions they found that

police negotiators remained passive and allowed the hostage taker to determine the interaction frame, while in other circumstances the police appeared to take an active role in promoting the framing of dialogue. Of course, this research was not directly focused on linguistic style, but it seems plausible that a similar dynamic pertaining to who controls the linguistic code may emerge. Thus, we may expect negotiation success to be associated with high turn-by-turn linguistic style matching, and we may look to the patterns in negotiator dominance to determine how such matching emerges from the interaction.

Change in Linguistic Style Matching over Time

Contemporary research into conflict negotiation recognizes the importance of capturing patterns of change in behavior over time. Many studies have associated successful negotiations with increased coordination of ideas and reduced levels of positional arguing, and unsuccessful negotiations with ineffective relationship management and increased competitive bargaining (Jones, 1988; Putnam, Wilson, & Turner, 1990; Simons, 1993). Success comes from a convergence of viewpoints and positions over time, which is a phenomenon that language research has associated with synchrony in word use and "smoothness" of interactions (Bernieri & Rosenthal, 1991; Chartrand & Bargh, 1999). Consistent with this association is Donohue and Taylor's (2003) study of terrorist negotiations, which found that authorities tend to respond to terrorist violence with increased tactical aggression and respond to terrorist dialogue with increased conciliation. On a more dynamic level, Donohue and Roberto (1996) have shown that hostage negotiations move through stages in which parties increase and decrease the similarity of their behavioral orientation. The extent of this matching in the

final stages of interaction is related to negotiation success, with greater coordination around relational and instrumental issues being more likely to lead to a successful resolution (Donohue & Taylor, 2003; Olekalns & Smith, 2000; Taylor, 2002a).

Current Study

In this paper we explore the dynamics of linguistic style matching by examining the interactions between police negotiator and hostage taker in nine protracted crisis negotiations. We use crisis negotiations because they are characterized by a set of conditions (e.g., high stakes, considerable ambiguity) that stretch the communication process beyond what occurs in normative contexts. They are intense, emotional interactions in which messages often have serious consequences and in which relational dynamics (e.g., building trust, saving face) are as important as the need to exchange information and reach substantive agreements (Donohue et al., 1991; Taylor & Donohue, 2006). In a context where negotiators rarely have face-to-face contact, these characteristics mean that the communication between police negotiator and hostage taker is a rich set of data source for testing hypotheses about linguistic style matching.

Following Niederhoffer and Pennebaker (2002) and the findings of negotiation research, we predict that the relationship between negotiation success and synchrony in negotiators' orientations would also occur at the word level. If negotiators increase the extent to which their linguistic styles are matched, then this would signify that they hold similar perspectives of the conflict and its possible resolution. Such harmony is likely to lead to normative problem solving and the enhanced possibility of a successful outcome.

We therefore predicted that:

Hypothesis 1: Successful negotiations will be characterized by a greater degree of linguistic style matching relative to unsuccessful negotiations.

Hypothesis 2: Successful negotiations will be characterized by a greater degree of turn-by-turn style matching relative to unsuccessful negotiations.

Hypothesis 3a: Successful negotiations will be characterized by an increase in linguistic style matching over the final stages of interaction.

Hypothesis 3b: Unsuccessful negotiations will be characterized by a decrease in linguistic style matching over the final stages of interaction.

Method

Negotiation Sample

Data were an opportunity sample of transcripts of dialogue from nine actual hostage crises. They were produced from the audiotape recordings of several U.S. police departments. The transcripts represent a diverse range of crises that include "criminal" incidents, in which an individual seeks to make a material gain; "domestic" incidents, in which an individual seeks sympathy for a personal need; and "political" incidents, in which an individual seeks to highlight a social movement or political cause. The transcripts contain 10,486 utterances spoken primarily by police negotiators (43%) and hostage takers (46%), but also by third parties such as friends and relatives (12%). Because the majority of interaction in the transcripts is between police negotiators and hostage takers, we focused our analysis of LSM on these speakers by removing the dialogue of third parties. A description of the scenarios and events that characterized each of the nine incidents may be found in the Appendix (see also Taylor, 2002a, pp. 8-9).

Classification of outcome. To study the relationship between LSM and negotiation outcome, it was necessary to classify each incident as either successful or unsuccessful. Recognizing that several different strategies can lead to the successful resolution of a hostage crisis (e.g., tactical intervention), we based our classification on only the success of the negotiation. Specifically, in line with previous research (e.g., Donohue & Roberto, 1996; Taylor, 2002a), we evaluated whether or not the negotiation generated a peaceful resolution without making any judgment about the overall success of the incident. This classification was accomplished through a careful analysis of each transcript and through cross-validation with third-party accounts and newspaper reports. Of the 9 negotiation transcripts, 4 were categorized as successful and 5 as unsuccessful.

Capturing change over time. To test whether or not negotiation outcome is systematically related to changes in LSM over time, it was necessary to divide each negotiation into a series of interaction episodes. Consistent with previous research (e.g., Donohue & Roberto, 1996; Rogan & Hammer, 1995), we partitioned each negotiation into six equally-sized periods of interaction. The use of six periods was determined by our desire to allow for the possibility of observing variation in LSM in each of the major phases of hostage crises. Specifically, while there is no absolute agreement about the number of phases that negotiations move through, most existing accounts incorporate three fundamental phases, with additional divisions appearing as sub-phases of the main three (Holmes, 1992). This is consistent with Holmes and Sykes's (1993) analysis of hostage negotiations, which found that Gulliver's three phase model best captured the dynamics of the crisis interactions. Thus, on the basis of Holmes and Sykes's finding, our use of six periods is aimed at enabling two observations of LSM for each of the major

phases of interaction. The use of six periods was also methodologically important, since division of the transcripts into further smaller sections of utterances may have reduce the ability of the analysis to identify meaningful patterns of change in negotiators' word use.

Measuring Linguistic Style Matching

Drawing on the work of Niederhoffer and Pennebaker (2002), we measured LSM using a computer-based text analysis program known as Linguistic Inquiry and Word Count (LIWC). LIWC summarizes linguistic style by measuring the extent to which a speaker uses words associated with a number of psychological and linguistic categories. Specifically, LIWC analyzes a text file on a word-by-word basis, comparing each word in the file to 2,290 words and word stems in an internal dictionary (Pennebaker, Francis, & Booth, 2001). The words in this dictionary have been rated by judges as representing a variety of different psychological or linguistic categories. These include standard linguistic categories such as word count, pronouns, and articles, categories relating to psychological processes such as affective or emotional, cognitive, and sensory processes, and categories that measure references to space, time, and motion. For any given text file, LIWC calculates the number of words that match each of the categories in the dictionary, and then expresses these frequencies as a percentage of the total number of words in the text. The resulting percentages of occurrence for the dimensions provide a summary or "profile" of a speaker's linguistic style. This profile has been shown to be reliable over time and linked to factors such as suicide proneness (Stirman & Pennebaker, 2001), health behaviors (Pennebaker & King, 1999) and deception (Newman, Pennebaker, Berry, & Richards, 2003).

While LIWC can calculate scores for more than 70 language categories, we followed the approach of Niederhoffer and Pennebaker (2002) and used a subset of 18 categories that have been shown to have good reliability. Table 1 presents these categories together with a brief description and example words. We used scores on these 18 categories to assess the extent of LSM between police negotiators and hostage takers in two ways. Our first approach was to derive an overall evaluation of LSM through a between-subjects comparison that correlated the scores derived from police negotiators' dialogue to the scores derived form hostage takers' dialogue. Specifically, for each period of each negotiation, we separated the utterances of the police negotiator from the utterances of the hostage taker and subjected them to a separate LIWC analysis. The resulting scores provided a profile of that speaker's word use, and we correlated the two profiles to gain a measure of how well the two speakers' word use was matched at the conversational level.

Our second approach sought to gain a more specific measure of LSM by evaluating how well negotiators synchronized their dialogue over each turn of the interaction. The focus here was on measuring the extent to which a police negotiator's utterance at, say, Time 1, was matched by what the hostage taker said in response at Time 1, and also how that response compared to the police negotiators own reply at Time 2. This turn-by-turn level analysis was achieved by deriving LIWC scores for each utterance in the negotiations, which were derived as a proportion of utterance length (rather than absolute occurrence) to take account of variations in the length of each speaker's turn. They were then arranged to enable correlations to be computed among scores for adjacent utterances. Specifically, for each of the 18 dimensions, we computed two separate

correlations. The first was the simple correlation between the utterances of the police negotiator and hostage taker (e.g., utterances at Time 1, utterances at Time 2, etc.). The second required lagging the hostage takers statements by one turn, resulting in a correlation between the hostage takers utterance at Time 1 and the police negotiators utterance at Time 2. These two correlations were then averaged to produce a measure of turn-by-turn LSM for each of the linguistic categories.

Note that any difference between the two turn-by-turn correlations may provide some indication of which of the two negotiators is most likely "leading" the conversation. A speaker who is dominant in an interaction is less likely than a submissive speaker to ensure that his or her response matches the other party's cue. Consequently, the correlation derived from instances of the dominant speaker responding to the submissive speaker will be lower than the correlation derived from the submissive party responding to the dominant speaker. For example, a relatively higher value for the correlation measuring hostage taker responses to the police negotiator utterances, when compared against the correlation for police negotiators responses to the hostage taker utterances, would suggest that the police negotiator has a greater influence or dominance over the behavioral style adopted by the hostage taker. Because such discrepancies may reveal something about how LSM emerges between the negotiators, we also report the maximum of the two correlations for each comparison.

Results

H1: Linguistic Style Matching and Outcome

To test the prediction that greater LSM occurs more in successful negotiated crises, we correlated police negotiator and hostage taker dialogue at both the

conversational and turn-taking level. Table 2 shows these correlations across the 18 linguistic dimensions for both the successful and unsuccessful negotiations. Consistent with Hypothesis 1, the correlations associated with successful negotiations are on the whole higher than the correlations associated with unsuccessful negotiations. Specifically, at the level of whole conversation (column 1 and 4 in Table 2), we found evidence of significant LSM in 14 of the 18 linguistic categories for successful negotiations and only 1 of the 18 categories for unsuccessful negotiations. Unlike negotiators in unsuccessful incidents, negotiators in successful interactions match not only their use of articles, prepositions, and present tense words, but also the extent to which they match each other's level of positive emotion, social concern, and use of cognitive mechanisms (e.g., exploring causation). Indeed, the degree of LSM observed for successful cases (mean r = .46) is almost ten times that observed for unsuccessful cases (mean r = .05), $F(1,34) = 29.43$, $p < .01$, $\eta^2 = .48$.

H2: Turn-by-Turn Matching and Negotiation Outcome

The mean correlations for the turn-by-turn comparisons are shown in columns two and five of Table 2. Consistent with Niederhoffer and Pennebaker (2002), these coefficients are lower in magnitude (but not in significance) than the correlations found for the complete interactions, though they typically remain positive in direction and are often significantly greater than zero. As can be seen in Table 2, the difference in turn-by-turn LSM across successful and unsuccessful negotiations provides only mixed support for Hypothesis 2. While the successful negotiations showed a greater overall degree of turn-by-turn LSM (mean r = .05) compared to the unsuccessful negotiations (mean r = .04), the differences at this level are not significant, $F(1,34) = .75$, *ns*, and vary

considerably over behavioral category. Specifically, negotiators in successful incidents demonstrated significant turn-by-turn matching in the length of their utterances (Word Count[1]) and in the way they organized their utterances (Articles and Prepositions). They showed a significant tendency to mirror one another's focus on the present (Present tense) and they often coordinate their problem solving to focus on causes (Causation) and the uncovering of new options and viewpoints (Insight). They also showed a tendency to jointly express positive emotion and, to a lesser extent, negative emotion.

In contrast, unsuccessful negotiations were associated with synchronized use of negative statements (Negations) and a tendency for negotiators to match each other, both in terms of focusing on the past (Past tense) and presenting ideas and viewpoints from the first person (1st-person singular). Rather than combine the unveiling of viewpoints with efforts to explicate the causes of the conflict, negotiators of unsuccessful incidents combined the unveiling of viewpoints with a tendency to match each other's recognition of differences (Discrepancy).

To further explore the mixed support for turn-by-turn matching, we investigated the contribution of each negotiator to the shape of the unfolding interaction. This was achieved by examining the Maximum turn *r* coefficients (see columns 3 and 6 in Table 2), which provide an indication of the extent one negotiator was found to imitate the style of the other party across the 18 categories. As might be expected, police negotiators were found to be conversationally dominant over more categories of dialogue in the successful cases, whereas hostage takers took the overall more dominant role in defining the style of unsuccessful cases. In the successful cases, the police negotiators played a dominant role in instigating positive dialogue. Hostage takers often reciprocated their focus on the

present (Present tense), their discussion of social issues (Social), their use of positive affect (Positive emotion), and their focus on problem solving through inclusion, insight and causation (Causation, Inclusion, Insight). In contrast, in the unsuccessful cases the hostage taker was dominant. By using negations (Negations), first person dialogue (First person dialogue), and behaviors that highlight discrepancies and exclusions (Discrepancy, Exclusion), the hostage taker promoted an interaction style that focused on self-face and the defense of a position.

H3: Changes in Linguistic Style Matching over Time

To test Hypotheses 3 that predicted an increase in LSM over time for successful negotiations, we examined the change in correlations between hostage taker and police negotiator dialogue across the six time periods. Figure 1 shows the correlations for LSM at the conversational level as a function of time period. An inspection of the upper panel in Figure 1 reveals only mixed support for H2a, with only three of the five unsuccessful cases associated with a final trend of decreasing LSM over time (i.e., Cases A, B and D). Similarly, as can be seen from the lower panel of Figure 1, only two out of four successful cases were associated with the predicted (H2b) increase in LSM over the final stages (Case G and I). Indeed, there is very little change in LSM over time for any of the successful negotiations. This is in contrast to the unsuccessful negotiations, which, without exception, are associated with striking oscillations between high and low levels of LSM across time. To further examine this difference in LSM variation, we divided the standard deviation of each negotiation's mean LSM scores by the mean LSM score to derive a coefficient of variation (Howell, 1997). The resulting average coefficient of

variation for unsuccessful negotiations (CV = .13) was almost three times the magnitude of the average coefficient of variation for the successful negotiations (CV = .05).

Discussion

Conflict researchers have long sought to understand how the ebb-and-flow of communicative interaction shapes the outcome of a negotiation. Our findings suggest that this ebb-and-flow occurs at the remarkably basic level of negotiators' language use. In line with Niederhoffer and Pennebaker (2002), we found convincing differences in the extent to which negotiators coordinate their linguistic style (i.e., use of different classes of words) in successful and unsuccessful negotiations. Not only were successful negotiations associated with higher aggregate levels of matched linguistic style, they were also associated with quite different patterns of style matching at the level of cues and responses. The negotiation dance, it seems, occurs not only at the level of instrumental exchanges and relational dynamics, but also at the level of language use. Negotiators engage in what might be called a "linguistic dance".

In line with a growing number of studies (Olekalns, Brett, & Weingart, 2003; Taylor & Donald, 2007), we sought a comprehensive picture of linguistic style matching (LSM) by consider patterns of behavior at both a conversational (macro) and turn-taking (micro) level. We consider these two levels of the negotiation process in turn.

Conversational Linguistic Style Matching

At the conversational level, we found significant support for our hypothesis (H1) that negotiators would show greater levels of linguistic style matching in successful negotiations compared to unsuccessful negotiations. This difference in matching encompassed all the dimensions of language we examined, suggesting that successful

negotiators develop and maintain a mutual interdependence or coordination of their interaction that subsumes problem solving style (e.g., insights, discrepancies), interpersonal thoughts (e.g., causations), and expressions of emotion. If the police negotiator interacted in short, positive bursts, then the hostage taker tended to follow suit. If the police negotiators' utterances emphasized concrete thinking (e.g., articles) or sentence complexity (e.g., prepositions), then this emphasis was often matched by the hostage taker. In sum, negotiators in successful cases were able to establish a common, mutually reinforcing way of interacting and perceiving the various issues of the conflict. They were able to find a common framing of the conflict (Rogan & Hammer, 2002), which allowed them to develop interdependence (Donohue, 2002) and take up a form of normative, adaptive problem solving (Taylor, 2002b). Such synchrony in interpersonal perspectives simply did not occur in unsuccessful negotiations.

Turn-by-turn Linguistic Style Matching

At a micro turn-by-turn level, we found a complex but organized set of differences in the type of behaviors associated with style matching across successful and unsuccessful negotiations. Specifically, the concentration of LSM during successful negotiations was around mutual turn taking, the extent of concrete thinking, the expression of positive emotions, a focus on present rather than past, and on the search for alternatives. In contrast, LSM in unsuccessful negotiations was characterized by a set of behaviors that might readily be associated with conflict spiraling (Holmes & Fletcher-Bergland, 1995). Behaviors included the reciprocation of negations, expressions of negative emotions, and a focus on the discrepancies between positions. What these results suggest (tentatively given the small amount of data examined) is that successful

and unsuccessful negotiations are not differentiated by differences in the degree to which a hostage taker or police negotiator engages in the interaction, as suggested by the coordination engagement hypothesis (Niederhoffer & Pennebaker, 2002). Rather, the distinction between successful and unsuccessful negotiations comes from differences in type of conversational engagement, with negotiators adopting a principally distributive or integrative language (Putnam, 1990).

So what determines the linguistic style that dominates a negotiation? This question was partly answered by our analysis of conversational dominance, where we found that police negotiators dictated the hostage takers responses in successful cases, but that the hostage takers were dominant in dictating the dialogue of unsuccessful cases. Of particular interest here is that speakers' dominance was not found to be universal across all facets of dialogue, as is often conceptualized by theory (Gottman & Notarius, 2000). Rather, the dominance asserted by police negotiators and hostage takers was specific to particular categories of dialogue, and in some cases co-occurred with instances of the other party dominating a different aspect of the dialogue. Dominance is thus a subtler phenomenon than traditionally conceptualized, and uncovering how it can differ in extent and quality should go some way to helping us understand role dynamics in conflict (Taylor & Donald, 2007). Perhaps more important, however, is identifying how a negotiator is able to take up the dominant position within an interaction. A detailed look at the turn-by-turn correlations over time should provide some insight into how dominance emerges over the initial period of interaction. This aspect of theory development should be of particular interest to crisis negotiators and their trainers given

the impact that dominance had on the quality and eventual outcome of the examined negotiations.

Changes in Linguistic Style Matching over Time

By examining LSM over six time stages of the negotiation, we were able to explore why there were dramatic differences in LSM across successful and unsuccessful negotiations. In contrast to our predictions (H3a and H3b), we found no evidence to suggest the differences in LSM were the result of successful negotiations being associated with an increase in synchrony over time. Rather, the differences were almost exclusively related to differences in the consistency of LSM, with unsuccessful negotiations associated with dramatic changes in the level of LSM over time compared to successful negotiations. One attractive explanation for this contrasting patterning of LSM across successful and unsuccessful negotiations may be found in relational order theory (Donohue, 2001). This theory views oscillations in interpersonal dynamics as the result of negotiators switching between periods of asserting power (moving against) and developing affiliation (moving towards)(Donohue & Hoobler, 2002; Donohue & Roberto, 1993). Periods of low LSM may arguably be occurring as one negotiator tries to assert his or her power over the interaction, which forced the other to defend his or her position. Styles increase in consistency when negotiators move away from relational tensions and jointly focus on resolving the substantive problem (Donohue & Taylor, 2003).

Conclusions

The analysis presented in this paper examines a small set of crisis negotiations, but the potential application of LSM in research is much wider. In the experimental context, LSM may provide a proxy measure for dynamics such as mimicry (Curhan &

Pentland, 2007) or entrainment (Taylor, 2002b), while particular dimensions may provide a way to measure latent constructs such as degree of positive affect or level of trust. Using linguistic style to make such measurements has the advantage of being non-disruptive and potentially less open to the biases of self-reporting (e.g., in post-negotiation questionnaires). Similarly, in the applied context, LSM may provide a measure of micro-level dynamics that can be compared against macro-level changes in the negotiation conditions. For example, it may be possible to link the degree of LSM in bilateral talks across nations with the subsequent cooperative or competitive behaviors of those nations (Donohue & Hoobler, 2002; Druckman, 1986; 2001). Identifying such associations will add value to efforts to unpack the processes that underlie and give rise to the trajectory and ultimate outcome of such negotiations.

In the grand scheme of things, what does a measure of LSM using word counts provide the practicing negotiator? The skeptic might argue that the current results show empirically what negotiators have long observed, namely, that there often exists a high degree of coordination and reciprocation in negotiation "moves," and that this coordination allows a negotiation to begin, unfold and resolve. However, the direct way in which measuring LSM captured the unfolding path of interpersonal exchanges has important applications. First, LSM and successful negotiation outcomes were associated with a particular use of words and word patterns, which may be integrated into negotiation strategies and taught as specific examples of good practice. Second, as argued by Pennebaker and King (1999), individuals vary widely in their communicative style, and LSM may represent, when compared to self-report, a more sensitive way of measuring an individual's capacity for engaging with or dominating an opposing

negotiator. Finally, following recent developments in automated transcription, it may be possible to incorporate a computerized LSM measure into a decision support tool. In extreme conflict environments such as hostage crises, methods that allow for meaningful tracking and assessment of a negotiation's progress are rare and much needed.

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Footnotes

[1] Names in parentheses correspond with variables in Table 1 and Table 2.

Table 1.
Description of 12 Linguistic Dimensions together with Sample Words

Dimensions	Description	Sample Words
Linguistic Categories		
Word Count	Total number of words in transcript	
Articles	Words used to refine (determine) understanding of a subsequent noun.	a, an, the
Negations	Expressions of refusal, contradiction or absence	no, never, not
Past tense verbs	Verbs expressed in the past tense	walked, were, had
Present tense verbs	Verbs expressed in the present tense	walk, is, be
Prepositions	Words used to relate a noun to some other constituent of the utterance	on, to, from
Social/Affect Categories		
First-person singular	Pronouns relating to the self	I, me, my
Negative emotion	Words of a negative valence and those indicating anxiety, anger and sadness	hate, worthless, enemy
Positive emotion	Words of a positive valence and those indicating happiness and assurance	happy, pretty, good
Social	References to relationships and interactions	talk, us, friend
Cognitive Categories		
Causation	Attempts to explain causes and effects	because, effect, hence
Insight	Words expressing the ability to think, learn and understand	think, know, consider
Discrepancy	Word giving an explicit indication of the tense, mood, or voice of another verb	should, could, would
Tentative	Words expressing uncertainty	maybe, perhaps, guess
Certainty	Words expressing certainty	always, never
Inclusive	Words used to encompass or join categories or ideas	with, and, include
Exclusive	Words used to distinguish what is included in a category and what is not	but, except, without

Table 2.

Linguistic Markers of Synchrony as a Function of Negotiation Outcome

	Successful Outcome			Unsuccessful Outcome		
	Conversation *r*	Mean Turn *r*	Max Turn *r*	Conversation *r*	Mean Turn *r*	Max Turn *r*
Linguistic Categories						
Word Count	0.82*	0.07*	0.08*>	0.82*	0.01	0.02
Words greater than 6 letters	0.99*	0.05	0.05*	-0.19	0.10*	0.11 <
Articles	0.77*	0.08*	0.09*>	-0.26	0.03	0.04 <
Negations	-0.40*	0.03	0.05	0.01	0.06*	0.08*<
Past tense	0.27	0.02	0.04 >	0.05	0.09*	0.10*
Prepositions	0.80*	0.10*	0.10*	0.03	0.01	0.02
Present tense	0.68*	0.08*	0.09*>	0.09	0.06*	0.06*
Social/Affect Categories						
1st-person singular	0.65*	0.05	0.05*	0.03	0.06*	0.06*<
Negative emotion	0.09	0.06*	0.07*	-0.05	0.05	0.05
Positive emotion	0.79*	0.08*	0.09*>	-0.05	0.06*	0.07*<
Social	0.49*	0.04	0.05*>	-0.08	0.01	0.02
Cognitive Categories						
Causation	0.66*	0.06*	0.06*>	-0.13	0.01	0.03
Insight	0.41*	0.05*	0.06*>	0.03	0.10*	0.11*
Discrepancy	0.43*	0.02	0.04	-0.16	0.06*	0.09*<
Tentative	0.69*	0.02	0.03	-0.07	0.00	0.01 <
Certainty	-0.08	0.02	0.03 >	0.32	0.02	0.04 <
Inclusive	0.61*	0.05*	0.07*>	-0.02	0.02	0.04
Exclusive	0.34	0.04	0.06*	0.13	0.02	0.04 <

Note: Conversation *r* refers to between-speaker correlations on the mean word categories ($N_{Unsuccessful}$ = 30, $N_{Successful}$ = 24; * = $p < .01$, one-tailed tests). Mean *r* refers to an average of the two possible correlations derived from a turn-by-turn comparison of scores. Max *r* refers to the maximum of these correlations ($N > 1000$; * = $p < .01$, two-tailed tests).
> = Police negotiator is conversationally dominant.
< = Hostage taker is conversationally dominant.

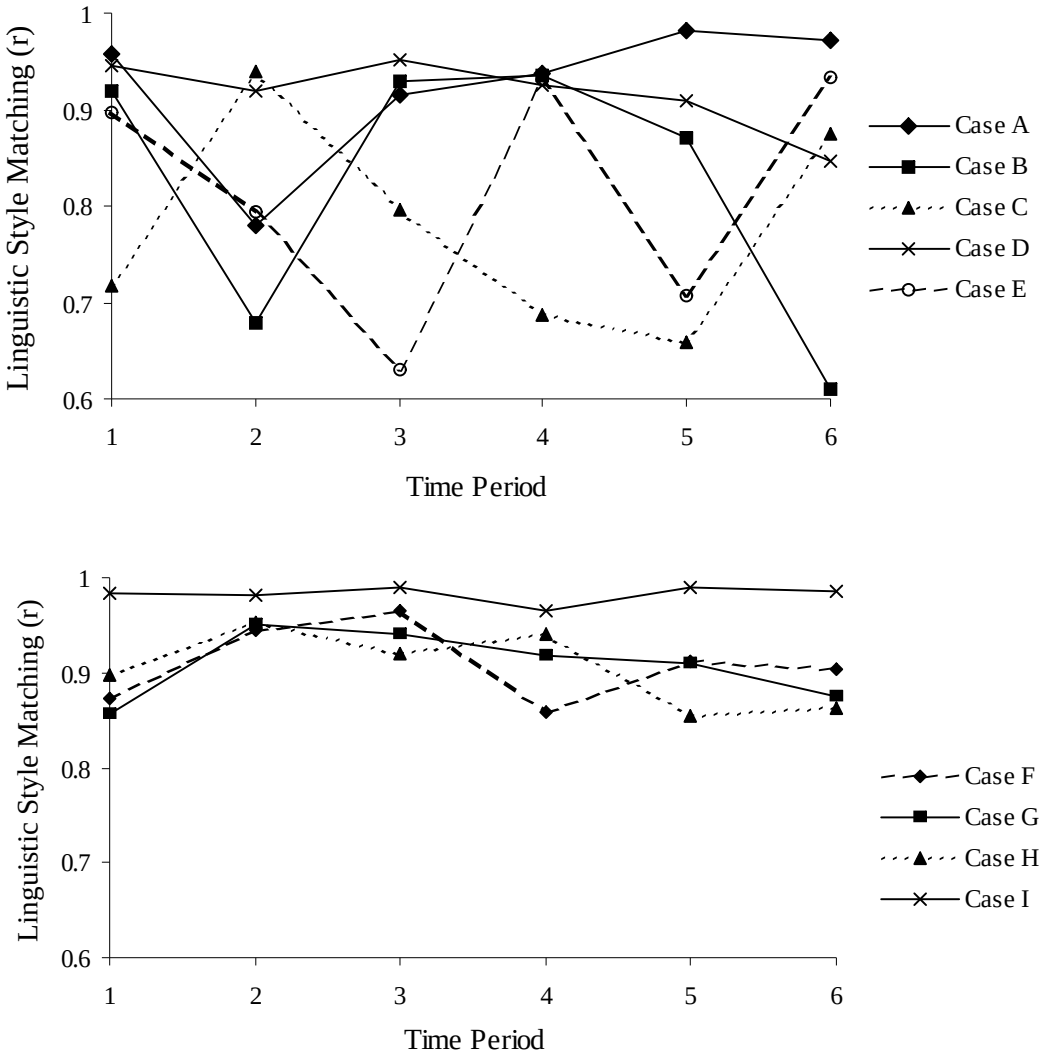

Figure 1. Conversational linguistic style matching as a function of time period for unsuccessful negotiation (upper panel) and successful negotiations (lower panel).

Appendix

Summary of the Crisis Negotiations Scenarios and Length in Utterances and Words.

		Length		
Case	*Outcome*	*Utter--ances*	*Words*	*Scenario*
Case A	Unsuccessful	1,781	18,772	After being caught robbing a bank, an armed male-female couple hold a female manager hostage. The police negotiate the release of the manager but are unable to dissuade the couple from committing suicide.
Case B	Unsuccessful	273	3,208	While fleeing police arrest, an armed male seizes an elderly couple in their home. He becomes agitated after talking with his mother and the police are forced to use a tactical intervention.
Case C	Unsuccessful	241	2,341	A male hostage taker demands a substantial financial reward in exchange for the negotiator's son. The negotiation is unable to bring about a successful resolution.
Case D	Unsuccessful	2,243	32,486	An armed, emotional individual barricades himself at home after provocation causes him to critically injure a family member. They are unable to persuade the individual to surrender.
Case E	Successful	151	2,779	An armed couple hijacks a local bus to publicize a religious cult and commit suicide in accordance with prophecy. The couple release hostages in return for media coverage, but subsequently commits suicide.
Case F	Successful	594	7,396	An armed male negotiates with law enforcement officers after taking a female bank clerk hostage to mitigate an unsuccessful robbery. After considerable negotiations, the male releases the clerk and shortly afterwards surrenders himself.
Case G	Successful	1,178	14,551	A single male holds his six-month old daughter hostage at the family home in an attempt to persuade the child's mother to retry life as a family. The male releases the child to the mother and shortly afterwards surrenders himself.

		Length		
Case	*Outcome*	*Utter--ances*	*Words*	*Scenario*
Case H	Successful	355	10,223	An unarmed male hold two pilots hostage in order to speak with his girlfriend and get adequate help for drug addiction. He is offered drug rehabilitation and speaks briefly with his girlfriend, following which he surrenders.
Case I	Successful	2,093	24,966	Inmates of a prison wing take hostage several guards to negotiate for better living standards. A mutually-trusted third party formulates an agreement that persuades the prisoners to return to their cells.