Speech Patterns and the Concept of Utility in Cognitive Maps: The Case of Integrative Bargaining

Tony L. Simons, Cornell University School of Hotel Administration

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TONY SIMONS Northwestern University

This study’s premise is that negotiation dyads’ conceptualization of utility is a key component of their “cognitive maps,” or internal representations, that influences the dyads’ assumptions and motivation. A linguistic indicator was developed for utility as an objective attribute, utility as a subjective preference, and utility as an interpersonal relationship. An analysis of 79 transcripts from two negotiation studies revealed that dyads whose members conceptualized utility as a subjective preference reached more integrative agreements than dyads displaying either of the other two conceptualizations. Also, as hypothesized, linguistic patterns from the first half of negotiation were better predictors of agreements than linguistic patterns from the second half of negotiation.
Several researchers have studied negotiation as a decision-making task (e.g., Bazerman & Neale, 1983; Pinkley, 1990; Thompson & Hastie, 1990). However, in their review of the field, Bazerman and Carroll (1987) noted a lack of empirical evidence concerning negotiators’ knowledge structures. Pinkley (1990) began to address this lack by developing a typology of “frames” through which disputants interpret conflicts. In the current research, I considered the ways in which negotiators conceptualize utility, or value, and examined the impact of different conceptualizations on the discovery of integrative solutions.

To pursue this framework, I developed a nonintrusive linguistic indicator of the utility component of cognitive maps, defining such maps as disputants’ internal representations of a negotiation situation and their objectives within that situation. Previous work on cognitive maps has primarily relied on self-reporting through structured interviews (e.g., Bougon, Weick, & Binkhorst, 1977) or questionnaires (e.g., Axelrod, 1976). As Walsh (1990) noted, though, these self-report methodologies are limited in their ability to elucidate assumptions of which subjects are not aware. Also, most measures of cognitive maps yield results that are highly unique to the given actor, which makes comparison across actors, and hence prescriptive research, very difficult. Attempts to assess assumptions and conceptual frameworks in negotiations have also relied heavily on self-reports. Pinkley (1990) used subjects’ own conflict descriptions as data for multidimensional scaling. Thompson and Hastie (1990) and Kimmel, Pruitt, Mageneau, Konar- Goldband, and Carnevale (1980) respectively assessed insight by asking subjects to describe their opponents’ payoff matrices and priorities. Assessing assumptions through self-reports presupposes that assumptions are accessible to awareness. Assumptions often remain invisible, however, until dis-confirmation makes them salient; people do not see their assumptions, just as a fish does not see water. The use of trace methodologies (Walsh, 1990), which track assumptions through the verbal or physical behaviors they generate, does not require that assumptions are accessible to awareness, and this difference represents an improvement over self-reports. The method developed for the current study avoided the problems of reflective self-reporting, was nonintrusive, and allowed for analysis of changes in cognition during the course of negotiation. This linguistic method may also serve as a template for analyzing indicators of cognitive maps and causal priorities in other decision-making situations.

THEORY AND HYPOTHESES

Integrative Negotiation as Problem Solving

Pruitt (1981) defined integrative negotiation solutions as those that reconcile, or integrate, the two parties’ interests, thereby expanding the total available pool of value. Most negotiation situations carry some potential for integrative agreements, or trade-offs in which both parties fare better than they would have under a simple compromise
solution (Pruitt, 1983). According to Pruitt (1981), integrative agreements are considered to be optimal negotiated outcomes because they expand the total pool of available value and create high levels of satisfaction for all the parties, and thus are often more stable than nonintegrative agreements.

This study measured integrativeness with an approach that Pruitt (1981) called “equal or better,” Harsanyi (1977) called “Pareto optimality,” and Tripp and Sondak (1992) called “Pareto efficiency.” According to this approach, solution A is more integrative than solution B if one party prefers A to B and the other party is indifferent or also prefers A to B. I chose this measurement of integrativeness over the more commonly used combined or joint profit because combined profit confounds the distribution of outcomes with the level of integrativeness achieved (Tripp & Sondak, 1992). In this article, “Pareto efficiency” will be used as a precise technical term for “integrativeness,” but the latter term must be used to refer to other studies that have employed different operational definitions, like joint profit.

Many people assume that integrative solutions are not possible and so do not look for them (Bazerman & Neale, 1983). This assumption, which Thompson and Hastie (1990) called the “fixed-sum assumption,” occurs when a negotiator assumes that all negotiators ascribe the same amount of utility to each disputed issue and, by extension, that one party’s gain equals another’s loss. In reality, negotiators often differ in their preference structures, and this difference creates the opportunity for mutually beneficial trade-offs and side payments. Thompson and Hastie (1990) provided strong evidence that most negotiators, especially inexperienced negotiators, approach bargaining situations with a fixed-sum assumption.

**Cognitive maps.** I assumed that cognitive maps (Axelrod, 1976) influence the presence or absence of the fixed-sum assumption that many individuals bring to negotiation. According to Weick and Bougon, “a cognitive map consists of the concepts and relations a participant uses to understand organizational situations” (1986: 106). A closely related term is “knowledge structure,” as used by Walsh (1990) and by Bazerman and Carroll (1987). Walsh described a knowledge structure as “a kind of mental template that individuals may impose on an information environment to give it form” (1990: 2). Pinkley (1990) describes such a phenomenon as a “conflict frame,” which is an evoked cognitive interpretation structure that guides disputants’ strategy selection and motivation. As noted above, this article uses “cognitive map” to describe disputants’ internal representations of a negotiation situation and their objectives within that situation.

This research applied a dyad-level notion of cognitive maps. The reasons for this level of analysis are (1) the negotiation task is a multiparty decision process and (2) the Pareto efficiency of outcomes is a variable that is only meaningful at the dyadic level, because it is an attribute of the two-party agreement and not of individual outcomes.
Weick and Bougon (1986) and Axelrod (1976) discussed the notion of collective cognitive maps, or aggregate maps that apply to groups. Bougon and colleagues (1977) formed an “average” of the maps elicited from 19 members of a jazz orchestra. Walsh and Fahey (1986) submitted that power distributions influence the development of collective cognitive maps or “negotiated belief structures.” Since the negotiation situations used in this research gave both negotiators equal power, I used an average to model the actual aggregation procedure.

**Utility in cognitive maps.** Economists define utility as the amount of usefulness or want satisfaction derived from the consumption of a particular good (Browning & Browning, 1986). By definition, the determination of utility is specific to each actor, though I argue herein that many actors fail to consider this fact. Axelrod (1976: 59) asserted that the location of the utility construct in an individual’s cognitive map—the closeness and direction of associations between relevant objects and the utility variable—determines decisions. By this Axelrod meant that a rational decision maker attempts to move toward maximal utility. The position of utility in the cognitive map, relative to other constructs, therefore directs rational behavior. I applied this proposition to negotiations, positing that negotiators’ conceptualizations of utility influence both the types of solutions they consider and the motivation they bring to the task.

Given a continuum of conceptualizations of utility, where things are seen as most important at one end and people are seen as most important at the other, three conceptualizations of utility can be described, one located at each end of the continuum, and one located somewhere in between. Despite some qualitative differences, these three conceptualizations blend into each other and so represent three convenient description points on a true continuum. In the reported research, this bipolar model formed the basis for a continuous linguistic indicator of these conceptualizations of utility.

At one end of the continuum is a conceptualization of utility as residing in things themselves, as being an objective attribute of those things. Under this conceptualization, the worth of an issue or item is as much an attribute of the item as the item’s weight or color. Someone holding this conceptualization might say, “This book is [objectively] worth 25 dollars.” When a dyad understands utility as an attribute, a fixed-sum framework makes sense because the issues or items themselves, and hence the utility in them, can only be divided between the two negotiators. A conceptualization of utility as an objective attribute is expected to inhibit a dyad’s discovery of integrative potential by reinforcing fixed-sum assumptions and thereby excluding integrative trade-off solutions from consideration.

Somewhere in the middle of the continuum is a conceptualization of utility as a subjective preference of a particular person for an issue or an item. This
conceptualization falls between the other two because this notion of utility is anchored to the link between person and thing rather than to either things or people in isolation; it implies that value is not contained in things or in people but rather in the relationship between a person and a thing. In this light, worth resides in the eye of the beholder, or in each person's attitude toward (or preference for) a particular item. Someone holding this conceptualization might say, “I [personally] want 25 dollars for this book.” When a dyad understands utility as subjective preference, a fixed-sum assumption is not implied because this understanding admits the possibility of the two negotiators’ valuing items differently. Fixed-sum assumptions, as Thompson and Hastie (1990) noted, are a prevalent and substantial barrier to the discovery of integrative agreements. A conceptualization of utility as a subjective preference is expected to facilitate a dyad’s discovery of integrative potential by not reinforcing fixed-sum assumptions while retaining negotiator motivation to get a good deal.

At the other end of the continuum is a conceptualization of utility that essentially ignores the utility associated with the issues or items under negotiation. In this conceptualization, worth resides only in people, and the things negotiated over are irrelevant to utility. Someone with this conceptualization might not mention “the book” very often at all, as it is not considered very important. This individual would see the interpersonal relationship between the negotiators as being of central concern, and, at the extreme, see negotiating a good deal or price as irrelevant to utility. This conceptualization might apply to friends or to others who do not really buy in to the stated profit-maximization goals of the negotiation task and so are not motivated to push for a good deal. Because such negotiators’ primary objective is to maintain their interpersonal relationship, they are likely to avoid the problem-solving struggle and acknowledgment of conflicting goals that are necessary to attain an integrative solution—they may instead opt for a simple compromise, or splitting the difference. Fry, Firestone, and Williams (1983) and Pruitt (1983) documented this potential outcome of high interpersonal attraction. A conceptualization of utility as interpersonal relationship is expected to inhibit a dyad’s discovery of integrative potential by lowering motivations to negotiate a good deal or, more accurately, by providing a superordinate goal of maintaining smooth relations.

Thus, a conceptualization of utility as an objective attribute motivates negotiators to work hard for a good deal but at the same time reinforces fixed-sum assumptions and thereby inhibits the discovery of integrative solutions. A conceptualization of utility as an interpersonal relationship does not motivate negotiators to work hard to secure high profits because the negotiators conceive of utility in terms that are outside of profit maximization. A conceptualization of utility as a subjective preference provides negotiators with sufficient motivation to maximize profits and does not reinforce fixed-sum assumptions. A conceptualization of utility as a subjective preference should therefore promote more integrative solutions than the other two conceptualizations.
How Language Reflects Utility in Cognitive Maps

Tomlin’s (1985) linguistic theory suggests an indicator of these different conceptualizations of utility. Tomlin proposed that speakers’ understanding of the immediate goal-relevance of different items will determine the ordering of noun phrases in sentences; noun phrases are defined as words or groups of words used as nouns. Items that speakers perceive as highly relevant to their immediate goals in speaking are expected to precede items that are less relevant. Thus, for example, a speaker describing a surgical technique, with the goal of teaching that technique, will refer to critical procedures or implements before referring to the surgeons, their assistants, uninvolved organs, and so forth. Tomlin reported applications of this approach to surgical reports and other technical reports and then applied the framework to verbal play-by-play descriptions of hockey games. He found, as predicted, that references to players with the puck preceded references to the puck alone, which in turn tended to precede references to players without the puck. Negotiators’ perceptions of goal-relevance should be closely linked to their conceptualizations of utility, as the negotiators’ goal is presumably the maximization of utility.

Ward and Prince (1991) provided an argument that supports Tomlin’s contention, stating that the first noun phrase of a sentence tends to represent information that a speaker assumes is attended to (“given”) in the consciousness of the addressee. Thus, the ordering of noun phrases within sentences should reflect a speaker’s inferences about the listener’s focus of attention. If negotiator behavior is largely rational and goal-directed, it makes sense for negotiators to focus their attention on that which they perceive as most goal-relevant. Thus, it is reasonable for negotiators to assume that their negotiation partners are, at least to a significant degree, “keeping their eyes on the prize.” In most action contexts, “focus of attention” and “perceived goal relevance” should be highly correlated.

A few caveats apply to the application of linguistic research to organizational behavior questions. First, those approaches have primarily been applied to questions asked by linguists, such as “When is a sentence rendered in the passive aspect rather than in the active?”, rather than to questions about how to infer the structure of underlying cognitive maps from speech patterns. Second, standards of proof in linguistics differ from those in organizational behavior, and statistical significance tests are sparse in linguistics research.

Despite these caveats, both the cited linguistic arguments strongly suggest that the nouns that a speaker typically places at the beginning of sentences indicate items that the speaker perceives as centrally important. This reasoning forms the basis for a linguistic indicator of conceptualizations of utility. Negotiators’ conceptualizations of utility as an attribute, utility as a preference, and utility as an interpersonal relationship should influence perceptions of the relative relevance to goals of things and people in a
negotiation, and those conceptualizations should therefore influence the position in spoken sentences of references to things and to people. Dyads with a conceptualization of utility as an objective attribute will start more sentences with references to things than to people and will therefore generate a low proportion of person-focused sentences. Dyads with a conceptualization of utility as a subjective preference will start comparable amounts of sentences with references to things and to people and will therefore generate a moderate proportion of person-focused sentences. Dyads with a conceptualization of utility as an interpersonal relationship will start most sentences with references to people and will therefore generate a high proportion of person-focused sentences. Thus, the three conceptualizations of utility will be reflected in low, moderate, and high proportions of person-focused sentences.

Phases in Negotiation

Some researchers have proposed that negotiations can be broken down into phases in which different tasks are required and in which different types of verbal behavior predominate (e.g., Hinkle, Stiles, & Taylor, 1988; Morley & Stephenson, 1977). Research on multiparty decision making (e.g., Poole, 1981) has indicated that group discussion often begins with a period of orientation toward the problem, or problem definition. Thompson and Hastie (1990) argued that the perception of variable-sum possibilities within the first few minutes of negotiation is critical to the attainment of integrative solutions, and they found that people who detected this possibility early in negotiation earned higher payoffs than did those who perceived the possibility later; this finding was, however, only marginally significant (p < .08). Furthermore, qualitative examination of the negotiation transcripts used for the first part of this research showed that early negotiations entailed a lot of expository and role-oriented verbal behavior, and late negotiations often entailed little more than rapid-fire offer-response-counteroffer exchanges. For these reasons, I tentatively hypothesized that early negotiation verbalizations would better predict negotiated outcomes than would later verbalizations, as early discussion involves defining issues and later discussion is less reflective. A quantitative pilot test supported this hypothesis.

Hypothesis 1: Dyads that conceive of utility as a subjective preference rather than as an objective attribute or as an interpersonal relationship will be the most likely to discover integrative agreements. Thus, moderate proportions of person-focused sentences will be associated with greater Pareto efficiency than will high or low proportions.

Hypothesis 2: A dyad's language patterns in the first half of negotiation will better predict the Pareto efficiency of negotiated agreements than will language patterns in the second half of negotiation.

STUDY 1

Methods
**Data.** I analyzed unpublished data, in the form of transcribed videotapes, collected by Roloff (1990). Subjects were 24 dyads of undergraduate students (48 students) enrolled in introductory communication studies courses. These students had not yet studied integrative negotiations, though some may have encountered the basic concepts in their previous courses. Subjects participated in the study in return for extra course credit. No monetary rewards were offered for high performance; however, as motivation is part of the present explanatory framework, outcome variation introduced by varying degrees of subject motivation was considered relevant data.

**Experimental task.** Subjects were asked to act out a negotiation between a student and a shopkeeper over the return price of three used course books. The task used in this study was a negotiation role play with integrative potential very similar to those used by Pruitt (1981). In these tasks, the two participants seek to maximize their point scores by arriving at a mutually acceptable solution on three issues, which can be negotiated independently. Each of the three issues has nine possible outcomes, and the negotiators are given a payoff matrix that illustrates how many profit points they would get from each outcome on a given issue. Thus, there are $9 \times 9 \times 9 = 729$ possible three-issue solutions. The situations provide opportunities for integrative solutions: if the two negotiators discover that the three issues are valued differently according to their payoff matrices, they find that by trading off appropriate issues, they can increase their own profits without necessarily decreasing the profits of their opponent. In this case, the combined solution of “price A” on book one and “price I” on book three provides more points for each negotiator than would a compromise price on both books. The “pie” of total available profits in these exercises is not fixed; it varies with the degree of appropriate trade-off between the negotiators.

**Dependent variable.** Pareto efficiency was calculated following Tripp and Sondak (1992) as a proportion based on the number of possible solutions that are equal or worse for both dyad members relative to the number that are equal or better for both members. The formula used is

\[
\frac{\text{number of equal or worse solutions}}{\text{number of equal or worse solutions} + \text{number of equal or better solutions}}
\]

Because solutions with profit distributions identical to the examined solution fit the criteria of both equal or better and equal or worse, they were excluded from the calculation. A dyad that discovered the fully integrative solution and traded off the issues completely in order to maximize the combined profit received an efficiency score of 100 percent. A dyad that split the difference on all three issues received a score of 50 percent. I calculated the Pareto efficiency of each negotiated outcome using a spreadsheet template developed for this purpose.
Independent variable. The units of information that were analyzed in this study were sentences as distinguished by a transcriptionist translating dialogues from verbal to written form. The sentence as a unit of measurement differs from the more frequently used “psychological unit,” which consists of a single subject and a single predicate (e.g., Morley & Stephenson, 1977), in that it allows more complex grammatical structures to be coded as single units if the speaker’s intonation and timing suggest that the material constitutes a single sentence. The planned application of linguistic arguments that apply specifically to sentences necessitated use of this unit of measurement. Guetzkow’s U (Folger, Hewes, & Poole, 1984) is a measure of how reliably two coders break a given body of data into the same number of units. I broke the segments from random samples from six of the videotaped negotiations into a total of 111 sentences, and the transcriptionist broke the segments into 106 sentences. The resulting Guetzkow’s U of .023 shows high unitizing reliability.

I coded sentences, as delimited by the transcriptionist, as to whether the initial noun phrase was person-focused, thing-focused, or uncodable. The person-focused category included sentences with initial noun phrases in the first or second person, singular or plural (I, me, you, we, us), and references by name to the other negotiator. The thing-focused category included sentences with initial noun phrases referring to things, to acts or offers, to levels of negotiation issues, or to people other than those immediately involved in the negotiation. The uncodable category primarily included sentences without noun phrases, such as “Yes.” or “Ummm...” Inferable or implied noun phrases were not examined in the interest of reliability. The following are some coded samples. Person-focused: “I’ll go down to H.” “And if I gave you G, I’d be losing money.” “So you’d be willing to go with E for book three?” “Um, can we go back to book one?” “So, you won.” Thing-focused: “Um, how about price A?” “The binding isn’t ripped up or anything.” “Price E?” “But on the third book, I need C...” “Is this money coming out of your paycheck?” “People aren’t going to sell you their books because they’ll get better prices down the street.” Uncodable: “Okay.” “Uh, hmm.” “Hmmm...” “Well, no.” “Right.” “So?”

Interrater reliability. Prior to the final coding of the data, a linguistics doctoral student and I independently coded six transcripts. Of 1,097 codable sentences, there were initially 25 discrepant codes. After refinement and application of the decision rules laid out above, this number dropped to 11 discrepancies, or 99 percent reliability. Coefficient kappa (Brennan & Prediger, 1981) is a measure of interrater reliability that takes into account the chance overlap of unit categorizations. The kappa for this categorical coding was .98, which indicates high interrater reliability.

Methods of aggregation and analysis. I defined the first and second halves of negotiations by counting to the median speaking turn of each negotiation and analyzed data from the two halves separately. Poole (1981) used a similar method of
dividing a conversation into equal segments. The number of person-focused sentences and thing-focused sentences in each half of a negotiation were formed into a proportion at the speaker level, according to the formula

\[
\frac{\text{number of person-focused sentences}}{\text{total number of codable sentences}}
\]

and the proportions for the two negotiators were averaged to form a score for the dyad, which represents the utility component of the dyad-level cognitive map. This score, as the explanatory variable, will be referred to as the proportion of person-focused sentences.

The hypothesized relationship between moderate proportions of person-focused sentences and Pareto efficiency scores (Hypothesis 1) was tested using standard second-order linear regression analysis to assess whether there was an inverted-U relationship among the variables. Hypothesis 2, which predicts that language in the first half of a negotiation will predict outcomes better than language in the second half, was assessed by comparing the variance accounted for by the linguistic patterns of the first and second halves of negotiations, using Fisher’s z’ transformation (Cohen & Cohen, 1983). To rule out the possible rival explanation that short negotiations might mathematically yield more extremely person-focused sentence proportions, I tested the number of speaking turns in negotiation as a covariate (in this case, length might covary with the distance of the proportion from .5) and controlled for that variable in the regression equations.

Results

Data from this study supported both hypotheses. Proportions of person-focused sentences predicted the Pareto efficiency of outcomes, and this relationship was stronger for first-half language patterns than for second-half patterns. The distribution of data, however, did not permit assessment of the influence of extremely person-focused language patterns: visual inspection of the data showed that only one dyad displayed highly person-focused language. The relationship between examined speech patterns and the Pareto efficiency of outcomes was, however, strongly demonstrated in the low-to-moderate ranges of the predictor variable. Table 1 gives descriptive statistics and correlations for all variables for study 1. Table 2 gives results of the regression analysis for that study.

The results given in Table 2 show support for Hypothesis 1: the quadratic component of the regression model based on the first half of negotiation is significant. However, exclusion of the single highly person-focused dyad resulted in this quadratic component dropping to marginal significance (p < .10). Thus, a simple linear model fit most of the data, though the one highly person-focused dyad reached low Pareto efficiency, as predicted by the inverted-U model. Regression on data from the second
half of negotiation yielded coefficients in the same direction as the first-half regression, but none of these betas were significant. The test of Hypothesis 2, comparison of the variance accounted for by linguistic predictors from the first and second half of negotiations, yielded a z-score of 2.45 (p < .005, one-tailed test).

To assess whether any data points exerted extreme influence on the beta coefficients, I examined Cook's D statistic (Stevens, 1984) for each dyad. Stevens suggested as a general guideline that a Cook's D of more than 1.0 indicates that the point examined is influential on the coefficients. In this data, the highest Cook's D was .49. This fact does not negate the influence of the single highly person-focused dyad on the variance accounted for by the quadratic component of the model.

Results of study 1 strongly supported the hypothesized relationship between conceptualizations of utility in cognitive maps and the Pareto efficiency of negotiated solutions. Both hypotheses were supported, but the small amount of data left ambiguity as to whether the relationship between the linguistic variables and the Pareto efficiency of outcomes was linear or curvilinear. A simple linear relationship could have emerged from attributes of the linguistic indicator or of the subject population. It is possible that the linguistic indicator distinguishes conceptualizations of utility as an objective attribute from utility as a subjective preference but does not capture utility as an interpersonal relationship. A second possible explanation, suggested by the outcome achieved by the single highly person-focused dyad, is that there was insufficient representation of dyads using highly person-focused speech. This problem could be addressed by assessing a large number of subjects, by selecting subjects likely to focus on the relationship more than on the negotiation of the assigned issues, or by manipulating the negotiators' focus on the relationship. Study 2 addressed the ambiguous conclusions of study 1 by increasing the number of subjects.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Means</th>
<th>s.d.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Length</td>
<td>59.00</td>
<td>28.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Extremum of proportion, first half(^a)</td>
<td>.11</td>
<td>.09</td>
<td>-.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Extremum of proportion, second half(^b)</td>
<td>.12</td>
<td>.10</td>
<td>-.47*</td>
<td>.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Proportion of person-focused sentences, first half</td>
<td>.54</td>
<td>.12</td>
<td>-.03</td>
<td>.36</td>
<td>-.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Proportion of person-focused sentences, second half</td>
<td>.43</td>
<td>.15</td>
<td>.48*</td>
<td>-.42*</td>
<td>-.66***</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Pareto efficiency</td>
<td>70.37</td>
<td>21.35</td>
<td>-.20</td>
<td>-.26</td>
<td>-.01</td>
<td>.49*</td>
<td>-.14</td>
<td></td>
</tr>
<tr>
<td>7. Joint profit</td>
<td>43.10</td>
<td>3.84</td>
<td>-.08</td>
<td>-.22</td>
<td>-.05</td>
<td>.45*</td>
<td>-.10</td>
<td>.95***</td>
</tr>
</tbody>
</table>

\(^a\) N = 24.
\(^b\) These variables were calculated as the difference between the particular proportion and .5. They address the fact that negotiations with a small number of sentences are mathematically likely to have extreme high or low proportions of person-focused sentences. They were not used in the regression.

* p < .05
** p < .01
*** p < .001

11
STUDY 2

Methods

Data. Fifty-five transcribed audiotapes of dyadic integrative bargaining role plays from Kimmel and colleagues (1980) were analyzed using procedures identical to those used in study 1. Subjects were undergraduate students enrolled in an introductory psychology course who participated in the study in partial fulfillment of a course requirement. As in study 1, no monetary rewards were offered for high performance.

Experimental task. The negotiation task employed a three-issue design similar to that used in study 1, and the nominal topic involved the wholesale pricing of television sets, vacuum cleaners, and typewriters. The subjects' payoff matrices for this task were directly proportional to those used in study 1, and integrative solutions emerged from trade-offs on the three issues, just as in study 1. Thus, the structure of the problem-solving negotiation task was identical to that of the task used in the first study, but the setting differed. Although this difference in nominal content could have a main effect on the Pareto efficiency of negotiated outcomes, there was no reason to suspect that it would influence the relationship between conceptualizations of utility, linguistic patterns, and integrative outcomes.

Variables, coding, and analysis. The dependent and independent variables and hypothesis tests were identical to those used in study 1. Assessment of unitizing reliability from a sample of four transcripts resulted in a Guetzkow's \(U\) of \((141-140) / (141 + 140) = .004\), which indicates reliable unitizing. A colleague and I independently coded six transcripts. Of 729 sentences coded, there were 35 discrepant codes, or 95 percent reliability. The kappa for the categorical coding was .93.

Results

### TABLE 2

Results of Regression Analysis, Study 1

<table>
<thead>
<tr>
<th>Variables</th>
<th>First Half of Negotiation</th>
<th>Second Half of Negotiation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(\beta)</td>
<td>(\Delta R^2)</td>
</tr>
<tr>
<td>Length</td>
<td>-0.23</td>
<td>.010</td>
</tr>
<tr>
<td>Proportion of person-focused sentences</td>
<td>4.94**</td>
<td>.235*</td>
</tr>
<tr>
<td>Squared proportion(b)</td>
<td>-4.49**</td>
<td>.248**</td>
</tr>
<tr>
<td>Multiple (R^2)</td>
<td>.493</td>
<td></td>
</tr>
<tr>
<td>Overall (F)</td>
<td>6.488**</td>
<td></td>
</tr>
</tbody>
</table>

\(a\) \(N = 24\). All significant predictors were also significant with joint profit as the dependent variable.

\(b\) This statistic is the quadratic component of the model, or the squared value of the proportion of person-focused sentences.

\(p < .05\), one-tailed test.

\(p < .01\), one-tailed test.
In replication of study 1, data from this study supported both hypotheses. The
distribution of data and larger number of data points in this study better represented
high values of the predictor variable, clarifying the ambiguity presented by study 1.
Table 3 gives descriptive statistics and correlations for this study and Table 4 gives
results of the regression analysis. The quadratic component of the regression model
based on the first half of negotiation is significant. Regressed data from the second half
of negotiation yielded betas in the same direction as data from the first half, but no
betas were significant. Comparison of the variance accounted for by linguistic predictors
from the first and second halves of negotiations using Fisher’s z transformation yielded
a score of 1.33 (p < .05, one-tailed test).

To assess whether any data points exerted extreme influence on the coefficients,
I examined Cook’s D for each dyad. The highest D was .38, which is well below the D <
1.0 guideline.

DISCUSSION

This research developed and tested a linguistic indicator of dyads’
conceptualizations of utility as a critical component of cognitive maps during integrative
bargaining and showed that this indicator was related to the Pareto efficiency, or
integrativeness, of negotiated solutions in two different data sets. Within this result are
several possible contributions to negotiations research and practice and cognitive maps
research as well. However, as with many new methods and ideas, these initial studies
have limits that need to be addressed before the theory and method can be fully
embraced.

These studies used data from undergraduate students in a laboratory context. It
is possible that managers differ substantially from students as to the relationship
between the language they use and their cognitions. Certainly, norms regarding self-
expression and the habitual phrasing of, for example, offers and questions, would
influence managers’ language. However, it is unlikely that those factors would alter the
basic relationship between language and thought. Although this link is admittedly
complex, and may well involve feedback loops (for instance, ‘Til know what I think
when I say it”), the fundamental processes that drive it are probably consistent across
populations. Analysis of real-world negotiation transcripts using frequency of impasse as
a crude indicator of integrativeness (Tripp & Sondak, 1992) could provide a powerful
assessment of this question.

A second, and potentially more dangerous, limitation of this research is the lack
of “triangulation” between the newly developed linguistic indicator and the more widely
used indicators of assumptions, cognitive maps, tactics, and motivations. The linguistic
indicator developed for this research is supported by theory, by its predictive power,
and by a lack of credible rival hypotheses explaining why it should predict integrativeness as it does. A further consideration is that existing measures do not assess quite the same construct: here, the cognitive map, of which utility is a component, was conceived as antecedent to motives, tactics, and assumptions. However, I would expect correlation between, for example, linguistic patterns and the degree of fixed-sum assumption as it has previously been measured. Unfortunately, such data were unavailable for the current research.

The model for conceptualizations of utility developed here may be useful for future integrative negotiations research, as it combines Pinkley’s (1990) task-relationship dimension of conflict frames with the fixed-sum assumption (Thompson &

### TABLE 3
Descriptive Statistics and Zero-Order Correlations, Study 2*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Means</th>
<th>s.d.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Length</td>
<td>96.87</td>
<td>73.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Extremism of proportion, first half b</td>
<td>.13</td>
<td>.10</td>
<td>-.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Extremism of proportion, second half b</td>
<td>.14</td>
<td>.12</td>
<td>-.14</td>
<td>.36**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Proportion of person-focused sentences, first half</td>
<td>.44</td>
<td>.16</td>
<td>-.08</td>
<td>.10</td>
<td>-.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Proportion of person-focused sentences, second half</td>
<td>.42</td>
<td>.16</td>
<td>-.18</td>
<td>.00</td>
<td>-.44**</td>
<td>.48***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Pareto efficiency</td>
<td>90.08</td>
<td>15.82</td>
<td>.37***</td>
<td>-.46***</td>
<td>-.09</td>
<td>-.14</td>
<td>-.21</td>
<td></td>
</tr>
<tr>
<td>7. Joint profit</td>
<td>4,815.46</td>
<td>415.09</td>
<td>.48***</td>
<td>-.39**</td>
<td>-.03</td>
<td>-.18</td>
<td>-.23</td>
<td>.92***</td>
</tr>
</tbody>
</table>

* N = 55.

b These variables were calculated as the difference between the particular proportion and .5. They address the fact that negotiations with a small number of sentences are mathematically likely to have extreme high or low proportions of person-focused sentences. They were not used in the regression.

** p < .01
*** p < .001

### TABLE 4
Results of Regression Analysis, Study 2*

<table>
<thead>
<tr>
<th>Variables</th>
<th>First Half of Negotiation</th>
<th>Second Half of Negotiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>0.27**</td>
<td>0.30*</td>
</tr>
<tr>
<td>Proportion of person-focused sentences</td>
<td>1.83***</td>
<td>0.33</td>
</tr>
<tr>
<td>Squared proportionb</td>
<td>-2.00***</td>
<td>-0.51</td>
</tr>
<tr>
<td>Multiple R²</td>
<td>.335</td>
<td>.184</td>
</tr>
<tr>
<td>Overall F</td>
<td>8.550***</td>
<td>3.842*</td>
</tr>
</tbody>
</table>

* N = 55. All significant predictors were also significant with joint profit as the dependent variable.

b This statistic is the quadratic component of the model, or the squared value of the proportion of person-focused sentences.

* p < .05, one-tailed test.

** p < .01, one-tailed test.

*** p < .001, one-tailed test.
Hastie, 1990) and accounts for both using a parsimonious framework. Unlike most applications of cognitive maps theory, which have been exploratory, ideographic, or both, this research contains the prescriptive suggestion that negotiators are most likely to increase the total available pool of utility if they take care to think about utility as subjective preference. Further, it provides clear evidence in support of Thompson and Hastie’s contention that early discussion in negotiation may be critical in defining issues in a way that promotes or inhibits the discovery of integrative solutions. Integrative solutions are a possible outcome for many managerial conflicts and dilemmas. Given that integrative solutions in natural settings are likely to be more complex, and hence more obscure, than they are in experimental tasks, it becomes even more important to avoid presuppositions that preclude viable integrative solutions from consideration. In practice, all decision makers need to examine how they are conceiving of utility to see whether they are acknowledging the subjective components of utility that point toward integrative solutions.

This research adds to the cognitive maps literature by examining Axelrod’s (1976) assertion that the construct of utility plays a key role in guiding decisions. The organizing function of the utility construct in cognitive maps has not yet received attention commensurate with its importance.

Finally, this research makes a methodological contribution in the linguistic indicator developed. Walsh (1990) noted a lack of nonintrusive trace methods for assessing knowledge structures (cognitive maps), a lack this study begins to address. Although the specified language patterns cannot be used to derive the whole cognitive map, I propose that they illustrate the utility construct that may be the single most critical feature of the map. The linguistic indicator provides insight into the structure of negotiators’ cognitive maps and may therefore be termed an indicator of those maps. Linguistic indicators of cognitive maps are needed for several reasons: first, their nonintrusive quality makes them easier to apply outside of a laboratory; second, they do not presuppose that assumptions are accessible to awareness; third, they are less susceptible to conscious manipulation than are self-reports; and fourth, they are not static and so can be used to track changes in cognitive maps over time. The theories used to develop this method may be applied to other situations and may, for example, generate linguistic indicators for strategic decision makers’ perceptions of the causal priority of different elements in their environments. Such an assumption-surfacing tool could be useful for researchers and practitioners.

The assessment of cognitive maps through linguistic analysis facilitates study of several important issues in multiparty decision making. How, for example, do individual cognitive maps really aggregate to the multiparty level? This study used a simple average to predict decision outcomes, but perhaps sheer quantity of speech is the weighting mechanism, or power, or perhaps outcome is determined by the quality of
the individual maps present. Methods like those used in the current study could be used to assess the predictive power of each aggregation method. How does the diversity of individual cognitive maps influence the process of decision making? The linguistic approach offers unique access to cognitive maps as they emerge from and influence social interaction. As measurement tools become more refined, they can provide additional insight into social decision processes in both laboratory and natural settings.
REFERENCES


Walsh, J. 1990. *Knowledge structures and the management of organizations: A research review and agenda*. Unpublished manuscript, Dartmouth College, Hanover, NH.

