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Getting to Best: Efficiency versus Optimality in Negotiation

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Negotiation between two individuals is a common task that typically involves two goals: maximize individual outcomes and obtain an agreement. However, research on the simplest negotiation tasks demonstrates that although naive subjects can be induced to improve their performance, they are often no more likely to achieve fully optimal solutions. The present study tested the prediction that a decrease in a particular type of argumentative behavior, substantiation, would result in an increase in optimal agreements. As substantiation behaviors depend primarily on supplied content of the negotiation task, it was also predicted that substantiation behavior would be reduced by curtailing the content. A 2 × 2 experimental design was employed, where both negotiation *tactics* (list of tactics present versus absent) and negotiation task *content* (high versus low) were varied to determine the processes leading beyond solution *improvement* to solution *optimality*. Sixty-one dyads engaged in a two-party, four-issue negotiation task. All negotiations were videotaped and analyzed. Although the list of negotiation tactics resulted in improved performance, only the content manipulation resulted in a significant increase in dyads achieving optimal solutions. Analyses of the coded protocols indicated that the key difference in achieving optimality was a reduction in persistent substantiation-related operators (substantiation, along with single-issue preferences and procedures) and an increase in a complex macro-operator, multi-issue offers that reduced the problem space, facilitating the search for optimality.

I. INTRODUCTION

Although negotiation is ubiquitous, research suggests that negotiation behavior is far from optimal. While negotiators frequently feel they have successfully "negotiated" with

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another party, research has consistently demonstrated that naive (untrained) negotiators are really not very good at getting to the best agreement, even when directed to do so (Neale & Northcraft, 1986; Pruitt, 1981; Raiffa, 1982; Weingart, Hyder, & Prietula, 1996). Movement toward an optimal solution is consequential in that it can result in additional gains to *both* parties' negotiating positions. Research has demonstrated how to make negotiators in these tasks better, but it has not demonstrated how to get these negotiators to best. The purpose of this research is to demonstrate how to do this. More to the point, this research reveals what *inhibits* getting to best in these types of tasks—the undue persistence of arguing for one's particular negotiating stance.

In this study, negotiation is viewed neither strictly as a mathematical game (e.g., Shubik, 1982) nor as a computational formalism (e.g., Sathi & Fox, 1989), but as a problem solving task (Prietula & Weingart, 1994). Thus, when negotiators engage in negotiation, they are in fact relying on the usual problem solving apparatus for cognitive tasks. Together, two negotiators attempt to develop a problem solution to which both parties can agree. The type of negotiating task described here involves two people (a dyad) faced with the requirement of reaching a joint agreement (e.g., how to spend an evening together). Reaching agreement requires multiple issues be decided (e.g., dinner, movie, transportation), each of which has several alternatives (e.g., dinner = Italian, Mexican, Thai; transportation = car, bus, taxicab). The values of the alternatives to each party are well-defined preference-equivalents given to each negotiator as "points," but not shared between them. Negotiators have opposing preferences for issue alternatives (e.g., Thai versus Mexican) and consider some of the issues differentially important to the final decision (e.g., Negotiator 1 is more concerned about the dinner chosen than what movie they will see; whereas Negotiator 2 is more concerned about the movie chosen than type of cuisine). Differential importance assigned to the issues (i.e., integrative issues) allows for tradeoffs as a means of improving value for both parties. Mutually beneficial tradeoffs occur when issues of differential importance are exchanged such that both parties concede on a less important issue to gain value on a more important issue. Opportunities for improving value for both parties make the task non-zero sum.[1]

A solution to the negotiating task requires the achievement of two specific goals: (1) an individual *attainment* goal for each negotiator (i.e., some overall value of the negotiated results); and (2) a collective *agreement* goal, whereby a solution is admissible only when *both* parties agree in total (i.e., the attainment goal for each party is satisfied). Thus, the fundamental problem space for each negotiator is defined by the set of potential values of the alternative issues, and the basic operators in the problem space generate specific issue values (as search for the possible alternatives).

With respect to the attainment goal, negotiators in the current study are motivated to maximize their own outcomes, which is accomplished by orienting instructions (e.g., "Earn as many points as you can in the negotiated solution") and rewards (e.g., "You will be paid cash based on the amount of points you earn in the negotiated solution."). Consequently, the attainment goal, and the operators that generate outcomes that move toward the goal, influences the search for solutions.

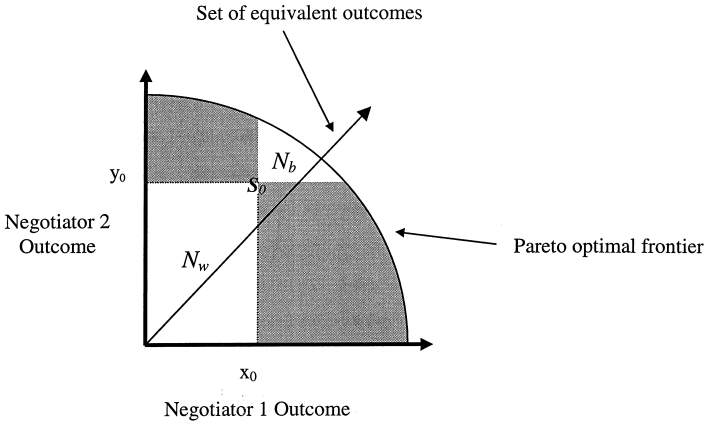

Figure 1. Measuring Pareto efficiency of solution sets.

However, the agreement goal alters the search for solutions occurring in the fundamental problem space. Specifically, as solutions unfold, they must incorporate aspects of the search by the other party—the two parties mutually inform and constrain each other. When two such self-interested parties negotiate, they rarely agree to solutions that are globally "best" for one negotiator and "worst" for the other; rather, their solutions occur in some interior point of the solution space, as depicted by point S_0 in Figure 1. Figure 1 represents the numeric preference values for each possible negotiated solution, for each negotiator, to a hypothetical problem. Thus, a solution point on the y-axis represents zero preference points for Negotiator 1, whereas a solution point on the x-axis represents zero points for Negotiator 2. The solution S_0 yields solution values of x_0 and y_0 to Negotiators 1 and 2, respectively.

Agreements that lie along the outer edge of the solution set constitute the Pareto optimal frontier (see Figure 1). Pareto *optimal* solutions are outcomes such that no other agreement can be found that increases the benefit to one party without decreasing the benefit to the other party (Raiffa, 1968). Given a solution, S_0, the set of points in the space N_b defines the subset of the solution space that contains additional solutions that can increase (or at least not decrease) the payoff to both parties. Movement toward the Pareto optimal frontier (in the N_b space) allows negotiators to achieve their individual attainment goals while also achieving the collective goal of agreement (Weingart & Prietula, 1991). Reaching the Pareto optimal frontier is the limit of that activity.

In Figure 1, the agreed solution, S_0, has unequal payoffs for the negotiators ($y_0 > x_0$) and falls short of the Pareto optimal frontier (i.e., the number of better solutions for both parties, N_b, > 0). The perpendicular distance of a solution (e.g., S_0) from a 45° angle bisecting the solution set represents the level of equivalence of outcomes across the two negotiators (i.e., the distribution of value between the parties). The conceptual distance between a current solution and the Pareto optimal frontier is a function of the number of solutions in N_b and N_w spaces, and is referred to as the Pareto *efficiency* (or integrative-

ness) of a solution. To improve the efficiency of a solution is to move to a solution in N_b space closer to the Pareto optimal frontier.

More often than not, negotiators fail to bridge the distance from improved efficiency to optimality—rarely achieving a Pareto *optimal* solution from the set (Neale & Northcraft, 1986; Pruitt, 1981; Raiffa, 1982). Both players may negotiate and gain ground, moving to some improved joint outcome solutions in N_b space, but they cannot seem to discover any of the "final paths" which lead to the best outcomes. In a sense, they leave the last few coins on the table. Although there is evidence as to what behaviors *improve* joint outcomes (Weingart et al., 1996; Weingart, Thompson, Bazerman, & Carroll, 1990; also see Pruitt & Carnevale, 1993 for a review), there has been no demonstration of the fundamental behaviors specifically accounting for the achievement, or lack of achievement, of Pareto optimal solutions in these tasks. However, results from a prior study (Weingart et al., 1996) have revealed an important hint—behaviors dependent upon a component of the task situation may be *interfering* with the achievement of Pareto optimal solutions. Specifically, the difficulty in achieving Pareto optimal solutions can be traced to a common, but critical, task-related behavior that arises from the task situation, substantiation—the generation of arguments supporting one's proposed negotiation solution.

II. THE ROLE OF KNOWLEDGE IN NEGOTIATION

Knowledge about the task situation and how one should negotiate leads to problem solving behaviors, which affect problem solutions. Consequently, the negotiators' knowledge is critical to performance in negotiation (Carroll & Payne, 1991). A large part of performance should be based on the ability of the negotiator to use his or her knowledge to define and determine critical aspects of the task, to generate an appropriate problem representation, to define the relevant goals in terms of that representation, and to bring to bear knowledge in service of those goals (Chi, Feltovich, & Glaser, 1981).

Performance in negotiation (as it is a problem solving task) largely depends on the task and the task-specific knowledge an individual can apply to the problem. Depending on the structure and context of the negotiation task, certain assumptions and tactics are more appropriate than others. As is typical with naive problem solvers, if the task is perceived as novel, experiences in other relevant tasks may not help, as the transfer of knowledge may not yield an approach that leads to a solution (e.g., Bassok & Holyoak, 1989; Novick, 1988). Therefore, if naive negotiators do not have (or cannot access) the knowledge relevant to achieving the particular orienting goal of the negotiation (e.g., maximizing the joint value of the agreement), then other knowledge may be triggered, such as heuristics, analogies or assumptions, leading to the engagement of processes that guide the negotiator away from achieving the orienting goal (Bazerman & Carroll, 1987; Bazerman, Magliozzi, & Neale, 1985; Neale, Huber, & Northcraft, 1987; Neale & Northcraft, 1986; Northcraft & Neale, 1987; Thompson & Hastie, 1990). This other knowledge can impede an effective search for solutions. However, evidence suggests that even minimal direct experience with a similar negotiation task is sufficient to generate (i.e., access newly learned or retrieve existing) key negotiation knowledge relevant to the orienting goal,

resulting in the engagement of processes that improve negotiation outcomes (e.g., Kelley, 1966; Neale & Northcraft, 1986; Thompson, 1990a, 1990b). Thus, the function of knowledge in negotiation has not gone unnoticed.

Negotiation Tactics

Relevant to this study is knowledge in the form of task-specific tactics that might influence negotiation outcomes as suggested in the negotiation literature (e.g., Lewicki & Litterer, 1985; Pruitt, 1981). These tactics function as heuristics in that they are general and facilitate search by directly or indirectly influencing the specification of goals and choice of operators, but do not necessarily guarantee that a solution will be found (Newell, 1990). Two broad categories of tactics, integrative and distributive, have been documented. These tactics are classified according to the nature of the search behaviors (particular subgoals and associated operators collectively referred to as tactics) they elicit. *Integrative* tactics typically address multiple issues and/or parties and contribute to the development of agreements that satisfy both parties concerns. In contrast, *distributive* tactics involve single issues and/or parties and are used to achieve unilateral concessions from the other party. It is suggested that distributive tactics impede the integrativeness of agreements (Pruitt, 1981), but may actually be necessary to distribute the resources generated (Lax & Sebenius, 1986). In the parlance of Figure 1, distributive and integrative tactics might jointly work to define and constrain N_b. As negotiators engage these task relevant behaviors, and offers are exchanged that represent value to the two parties, S_0 shifts, and the size of N_b necessarily changes as well. Consequently, both integrative and distributive tactics are considered potentially necessary for the individual negotiator to reach a satisfactory agreement (Pruitt, 1981).

Weingart et al. (1996) found that the Pareto efficiency of agreements between naive negotiators could be significantly improved by simply providing negotiators with descriptions of both integrative and distributive tactics (see Appendix A). An analysis of the negotiation protocols revealed that the presentation of these tactics led to significantly higher frequencies of integrative tactical behavior, which in turn resulted in the achievement of higher Pareto efficiency scores. Although Pareto *efficiency* was positively influenced by the tactics (significantly reducing the size of N_b), Pareto *optimality* was only minimally affected. Only 20% of the dyads receiving the list of tactics achieved optimality (9 of 45). None of the dyads that did not receive the list achieved optimality (0 of 45). As the tactics presented to these subjects were (theoretically) sufficient to promote behaviors leading to Pareto optimal solutions, the ability to do so might have been inhibited not by a particular deficit in knowledge, but perhaps by some component of the task situation itself.

The Emergence of Substantiation

An important characteristic of the task situation is revealed by focusing on behavioral similarities rather than differences. Results of the prior study (Weingart et al., 1996)

showed *no* effect of providing tactics on the frequency of use of a particularly important distributive behavior—substantiation. Substantiation typically involves an argument either made to support one's own position or to attack the other party's position in an attempt to persuade the other party to shift their position. This was significant as substantiation was negatively related to the achievement of Pareto efficiency, and substantiation behaviors were the most common processes across both conditions.

Analysis of the protocols showed that substantiation generally took the form of content-based argumentation. That is, justifications for (or against) an offer or position were made based on the specific domain of the task, as defined in the negotiation materials. In the task for this study (as will be explained later), this means that the arguments were based on descriptions of the roles the negotiators were playing in the negotiation (a florist and a baker) and the descriptions of their desired alternatives for each issue (e.g., the number of clerks desired for the store, or the desired temperature for a common area). Typically, a negotiator would initiate a specific substantiation (e.g., "*I* need this because. . . ") which would be reciprocated by the other party developing a substantive counter argument (e.g., "Well, *I* need this because. . . ") that involved not only the construction of an argument to support his or her promoted position, but the construction of additional arguments that would counter the other party's position. Substantiation would lead to more substantiation. It seems that the task content (a characteristic of the task situation) provided the material for a set of substantiation behaviors that dominated (in terms of frequency) the negotiation process, and when inappropriately applied to integrative issues, interfered with the discovery of solutions from the Pareto optimal set.

III. THE INFLUENCE OF SUBSTANTIATION

Thus, substantiation seems to be a likely suspect for interfering with optimal agreements, but how does it actually influence negotiation problem solving? One possible explanation is based on the observation that the actual cognitive demands of negotiating are high. The effects of task demand in negotiation have not been explicitly explored in the negotiation literature, but have been recognized as a source of potential difficulty. For example, Carroll, Bazerman, and Maury (1988) suggested that such demands might lead directly to *simplifications* (such as ignoring the cognitions of the other party) that affect negotiation outcomes. This may occur because a negotiator's capability to reason is constrained by limited physical, attentional, perceptual, and processing resources (Anderson, 1990; Eysenck & Keane, 1990). When those resources are taxed, the effectiveness of achieving a particular problem solving goal can be greatly reduced in naive or novice problem solvers (Hassebrock & Johnson, 1986), as demands on working memory result in events consequential to deliberation (Byrne & Bovair, 1997).

It is not clear that "simplification" is an unequivocal consequence of increased cognitive load. We propose that in typical (and even apparently simple) negotiation tasks (i.e., multi-issue, rich context), inappropriate *default* reasoning assumptions and inappropriate or overly persistent use of *distributive* behaviors can interfere with the application, recognition, or discovery of more appropriate integrative assumptions and behaviors.

When entering multi-issue negotiations, naive negotiators typically assume that all the issues are distributive and thus the task is zero-sum (Pinkley, Griffith, & Northcraft, 1995; Thompson & Hastie, 1990). This default assumption cues distributive behaviors, including substantiation, which are appropriate for zero-sum tasks or distributive issues, but are *not* universally appropriate for mixed-motive tasks, which include integrative issues. Misapplication of distributive tactics thus inhibits the achievement of the agreement goal.

Of the distributive behaviors, substantiation is the dominant tactic for negotiation, and has even been described as a "means for guiding the negotiation process to a settlement" (Sycara, 1990). Research shows that naive negotiators tend to engage in a high proportion of substantiation/argumentation (24–27%) in negotiations without time pressure (Carnevale & Lawler, 1986), suggesting that this distributive tactic is commonly and consistently employed in negotiations.

Not only is substantiation dominant, but the crafting of real-time substantiation arguments can also be cognitively expensive. A negotiator must know his or her own positional goals, analyze the components of the opponent's arguments, create counterarguments based on specific contents of the negotiation task materials (and the opponent's arguments) perhaps even drawing on additional knowledge of the particular domain, and so forth. As such, negotiation exchanges often involve high levels of verbal sentence comprehension and question-answering, which involves complex interactions of both general and specific knowledge structures (Airenti, Bara, & Colombetti, 1993; Altmann & Steedman, 1988; Kintsch, 1988; Robertson, Weber, Ulman, & Mehtra, 1993; Singer, 1984). It is a creative act and, therefore, an ill-defined problem in itself (Newell, Shaw, & Simon, 1964), with task-overloading issues similar to those found in text generation research (e.g., Beaugrande, 1984).

Pruitt (1981) suggests that engaging in the development of substantiation arguments may distract the negotiators from engaging in more integrative tactics. We believe this occurs because the cognitive effort to engage distributive behaviors dominates the limited reasoning capacity of a human negotiator, leaving less capacity to detect opportunities that could lead to more appropriate behaviors; behaviors that facilitate the achievement of Pareto optimal solutions. Once the behaviors are engaged, the cognitive resource limits inhibit change and the search for the sequence and combinations of behaviors that yield better solution outcomes is attenuated. Rather than simplifying the situation, negotiators react to the complexity of the situation by focusing on one subgoal (individual goal attainment) and associated behaviors (distributive) to the exclusion of other, more appropriate goals (reaching a joint agreement that maximizes outcomes) and behaviors (integrative). In essence, they become "stuck in a problem space" (Huguenard, Prietula, & Lerch, 1989).

Evidence supporting this explanation is found in a study by Weingart and Prietula (1991), who discovered that negotiators not only spent a large portion of their time substantiating their positions, but often were creative in their improvised exchanges, going well *beyond* the information content provided in the supplied negotiation materials. Within such complex interaction and derivative behaviors, the primary goal of searching for agreements that achieve maximum returns is subsumed within the more immediate,

and salient, goals arising out of the default zero-sum assumption and, more significantly, from substantiation behaviors.[2] As substantiation behaviors dominate the deliberation effort they become, for much of the negotiation, the primary processes by which agreement is to be achieved within the confines of a (wrongly) presumed zero-sum game.

In the current study we tested the role of substantiation in the discovery of Pareto optimal solutions by varying the *opportunity* of negotiators to engage in substantiation. If negotiators do not have detailed domain descriptions of their roles and alternatives in the negotiation task, they do not have the "stuff" out of which to craft domain-specific arguments and justifications for their positions. Rather, they would more likely rely on some of the other tactics to resolve the negotiation. This was accomplished by employing two versions of the original negotiation materials reported in Weingart et al. (1996). One version of the materials was simply the original materials used in that study. Basically, the subjects assumed one of two roles for the negotiation: a Baker or a Florist. They are deciding whether to move both their establishments to a new, shared location. The move is contingent on the two parties achieving agreement on four issues, with each issue having nine alternatives. For example, they must agree on the temperature of the common area, where the preferred temperature for the Baker is 67° and the preferred temperature for the Florist is 75°. We refer to this version of the task as "high-content" because it contained substantial domain-specific information, potentially resulting in high task demand.

The second version of the task, "low-content," was similar in structure to the first, but with one significant change—the semantic components of the roles and alternatives (i.e., the task content) were considerably reduced. Consequently, there were no descriptions of a Baker or Florist; rather, they were described as Negotiator 1 and 2. Similarly, issues were not described in terms of a particular property (e.g., temperature), but only referred to as Issue 1 through Issue 4. Finally, the interpretation of the alternatives (e.g., 67°) was dropped and only a letter descriptor (e.g., Alternative A of Issue 1) indicated the alternative. The numeric representations of the payoff schedules for the low and high content tasks were equivalent. Thus, the basic components of the problem structure (i.e., number of issues, alternatives per issue, payoff schedule) were retained, so the two negotiation problems described in the materials were isomorphic (Simon & Hayes, 1976).

Reducing the task content while preserving the fundamental structure of the problem minimized references to the specific negotiation domain. This also permitted all negotiation assumptions, strategies and tactics to remain relevant and applicable except for one—content-based substantiation. In effect, we took Neale et al.'s (1987) approach to removing role-related contextual information one step further. Without a particular domain represented, there can be little basis for incorporating substantiation based on domain content (e.g., a florist requesting a particular temperature). Even though naive negotiators may (and probably will) enter the negotiation task with a zero-sum assumption, the reduction of substantiation—a content-based negotiation behavior often affiliated with a zero-sum assumption—permits alternative approaches to be considered. With this dominant behavioral process inhibited, we expected significantly more negotiating dyads

would achieve Pareto optimal solutions. We know that knowledge matters. We do not know if that is enough.

IV. HYPOTHESES

It is predicted that substantiation behaviors (i.e., arguments and justifications) interfere with the discovery of Pareto optimal negotiation solutions. This discussion suggests the set of hypotheses listed below. All manipulations are presumed to be symmetric; that is, both parties in a negotiation dyad receive the same manipulation. First, the task content manipulation is expected to significantly increase the number of dyads achieving Pareto optimal solutions (Hypothesis 1). Reducing the cognitive demands of the task should facilitate the achievement of Pareto optimality.

Second, negotiators working with the low-content task are expected to engage in less substantiation behaviors than those working with the high-content task (Hypothesis 2), as we have removed the substance upon which the content-based substantiation operators depend. In one sense, this could be viewed as definitional; however, a direct test of this relationship is necessary to determine whether the manipulation actually had its intended primary effect.[3] Although content-less substantiation may occur (e.g., "I cannot survive if I don't get what I need"), the argument is that the content-based substantiation accounts for the primary variance in behaviors.

The lowering of task demands should influence other negotiation behaviors. Negotiators working with a low-content task are expected to exhibit a proportional decrease in distributive behaviors other than substantiation (Hypothesis 3). While working on the low-content task, the reduction in substantiation should lower the tendency for negotiators to focus on winning versus losing, reducing the frequency of other distributive behaviors. In addition, negotiators working on the low-content task are expected to use more integrative behaviors (Hypothesis 4). The reduction in distributive behaviors and associated zero-sum conceptualization of the task should free cognitive resources to possibly explore more integrative behaviors. This increase is not automatic, as a decrease in the proportion of distributive behaviors does not necessarily imply an increase in the proportion of integrative behaviors. Negotiators could shift from distributive behaviors to off-task or neutral behavior (e.g., socializing, task clarification, etc.) that would not be considered integrative in nature.

The final three hypotheses address the role of negotiation behaviors in determining Pareto optimal solutions. Hypotheses 5 and 6 focus on the effect of integrative and distributive behaviors on Pareto optimality. Hypothesis 7 predicts the mediating role of these behaviors in the relationship between task content and Pareto optimality.

Task Content and Solution Type

Hypothesis 1. Negotiators working with a low-content task will be more likely to achieve Pareto optimal solutions than negotiators working with a high-content task.

Effects of Task Content on Behavior

Hypothesis 2. Negotiators working with a low-content task will engage in less substantiation behavior than negotiators working with a high-content task.

Hypothesis 3. Negotiators working with a low-content task will engage in less distributive behaviors (other than substantiation) than negotiators working with a high-content task.

Hypothesis 4. Negotiators working with a low-content task will engage in more integrative behaviors than negotiators working on a high-content task.

Negotiation Behavior and Solution Type

Hypothesis 5. The increased use of integrative behaviors will increase the likelihood of achieving Pareto optimal solutions.

Hypothesis 6. The increased use of distributive behaviors will decrease the likelihood of achieving Pareto optimal solutions.

Hypothesis 7. The relationship between task content and Pareto optimality will be mediated by the use of integrative and distributive behaviors.

V. METHOD

Subjects and Design

One hundred twenty-two undergraduate subjects (61 dyads) participated in this study to partially fulfill a course requirement or earn $5.00 for attending the experiment. In addition, all participants were paid between $1.50 to $7.00 depending on their individual outcome at the end of the negotiation. Thirty-eight of the subjects were female and were randomly distributed across conditions. All subjects were naive (i.e., had received no formal training in negotiation).

A 2×2 experimental design was employed, crossing two levels of negotiation tactics (absent, present) with two levels of task content (high, low). Dyads were randomly assigned to a condition, resulting in 15 dyads in each condition, except for the low-content, tactics-absent condition, which had 16 dyads. The first factor is a replication of the relevant component of the Weingart et al. (1996) study.

Procedure

During the negotiation session, subjects were seated on opposite sides of a table with a chest-high barrier. This barrier prevented the negotiators from seeing the other party's information sheets but did not interfere with visual contact.

First, task materials were presented to the subjects. The form of these materials constituted the task content manipulation (discussed below). All negotiators received a

payoff schedule for a four-issue negotiation task. Negotiators' preferences for alternatives within each issue were expressed in terms of points (the task materials are discussed in more detail below). Subjects were not provided information about the other party's payoff schedule and were asked not to directly reveal their own profit point information from their payoff schedule (by exchanging profit point schedules or discussing point information). However, comparative issue preferences could be expressed. In addition, negotiators were given instructions to maximize their own profit. Subjects read, "Earn as many points as you can for your own store." This individualistic orientation was reinforced with a monetary payoff contingent on their individual negotiated outcome (mentioned above).

All negotiators were informed that if they chose not to reach an agreement, they would receive 99 points, their walk-away value. Thus, they should only reach agreements worth 100 or more points to themselves. This walk-away value was chosen to simulate the value of each negotiator's current business situation without limiting the solution set substantially (number of total potential solutions = 6561, number of potential solutions above the walk-away value = 5683, of which 81 were on the Pareto optimal frontier).

After the negotiation instructions were read, a pre-negotiation questionnaire was distributed to ensure subjects understood their payoff schedule. The subjects were allowed to refer to their task materials while answering the questions. If any of the questions were answered incorrectly, the subjects were asked to refer back to the case to correct their answers.

After completing the pre-negotiation questionnaire, the negotiation tactic manipulation was introduced (discussed below). Next, the subjects began negotiating. If necessary, negotiators were informed when five minutes remained in the session.[4] However, subjects were allowed to continue negotiating if they chose not to impasse (i.e., terminate the negotiation session without an agreement on all four issues). The negotiation session was videotaped so that negotiator behavior could be subsequently coded and analyzed.

Manipulations

Task Content. All subjects engaged in a two-party, four-issue negotiation task (see Table 1). Each issue had nine alternatives (A through I). The point structure of the task allowed for integrative solutions. If the negotiators explored beyond a simple split-the-difference solution (i.e., accept the midpoint value of all four issues), they could discover two of the issues (Clerks/Issue 1, and Advertising/Issue 2) were worth different amounts to the negotiators, making *tradeoffs* on these two issues possible. If these issues were discovered and traded off, joint profit could increase to a maximum of 560 points (the maximum joint value for Pareto optimal solutions in the set). The other two issues were distributive in nature (Temperature/Issue 3, and Maintenance/Issue 4) and were worth the same amount of points for each negotiator, with preferences on these issues going in opposite directions. If negotiators split the difference on all four issues (level E on each issue) they would settle on a strictly distributive solution and the total joint profit would be 440 points.

This task was embedded in a joint venture context for subjects in the high-content

TABLE 1
Landers Market Issue Descriptions and Payoff Schedule

Issue	Alternative	Payoff schedule[b]	Alternative description[c]
Clerks	A	• 0/80	• Hire clerks together to work in *both* departments; supervise *together*; payment split is *fixed*: Baker 40%, Florist 60%
(Issue 1)[a]	B	• 25/70	• Hire clerks together to work in *both* departments; supervise *together*; payment split is *fixed*: Baker 45%, Florist 55%
	C	• 50/60	• Hire clerks together to work in *both* departments; supervise *together*; payment split is *fixed*: Baker 50%, Florist 50%
	D	• 75/50	• Hire clerks together to work in *both* departments; supervise *together*; payment split is *fixed*: Baker 55%, Florist 45%
	E	• 100/40	• Hire clerks together to work in *both* departments; supervise *together*; payment split is *fixed*: Baker 60%, Florist 40%
	F	• 125/30	• Hire clerks together to work in *both* departments; supervise *together*; payment *depends* on hours worked for each store
	G	• 150/20	• Hire clerks together to work in *both* departments; supervise *separately*; payment *depends* on hours worked for each store
	H	• 175/10	• Hire clerks to work in *own* department (but can be *shared*); supervise *separately*; payment *depends* on hours worked for each store
	I	• 200/0	• Hire clerks to work in *own* department only (no sharing); supervise *separately*; payment *depends* on hours worked for each store
Advertising	A	• 0/200	• *Combined* ads with *joint* account: Baker 40%, Florist 60%
(Issue 2)[a]	B	• 10/175	• *Combined* ads with *joint* account: Baker 45%, Florist 55%
	C	• 20/150	• *Combined* ads with *joint* account: Baker 50%, Florist 50%
	D	• 30/125	• *Combined* ads with *joint* account: Baker 55%, Florist 45%
	E	• 40/100	• *Combined* ads with *joint* account: Baker 60%, Florist 40%
	F	• 50/75	• *Combined* ads with *joint* account: Baker 65%, Florist 35%
	G	• 60/50	• *Combined* ads with *joint* account: Each pays 6% of profit
	H	• 70/25	• *Combined* ads with *separate* account: Each pays 6% of profit
	I	• 80/0	• *Separate* ads with *separate* accounts: Up to individual store
Maintenance (Issue 3)[a]	A	• 0/40	• Baker 30%, Florist 70%
	B	• 5/35	• Baker 35%, Florist 65%
	C	• 10/30	• Baker 40%, Florist 60%
	D	• 15/25	• Baker 45%, Florist 55%
	E	• 20/20	• Baker 50%, Florist 50%
	F	• 25/15	• Baker 55%, Florist 45%
	G	• 30/10	• Baker 60%, Florist 40%
	H	• 35/5	• Baker 65%, Florist 35%
	I	• 40/0	• Baker 70%, Florist 30%

TABLE 1
Landers Market Issue Descriptions and Payoff Schedule

Issue	Alternative	Payoff schedule[b]	Alternative description[c]
Temperature (Issue 4)[a]	A	• 0/120	• 67 degrees
	B	• 15/105	• 68 degrees
	C	• 30/90	• 69 degrees
	D	• 45/75	• 70 degrees
	E	• 60/60	• 71 degrees
	F	• 75/45	• 72 degree
	G	• 90/30	• 73 degrees
	H	• 105/15	• 74 degrees
	I	• 120/0	• 75 degrees

[a]Issue names for the low-content materials were simply labeled Issue 1, Issue 2, and so forth.
[b]The two numbers reflect the Baker/Florist (and Negotiator 1/Negotiator 2) payoff schedules for the dyad roles. Subjects only saw their own payoff schedule.
[c]This descriptive information was removed for the low-content materials.

condition. These subjects assumed the roles of one of two entrepreneurs, a florist or a baker, which were considering the possibility of a joint business opportunity. The florist had approached the baker with the proposal of combining both businesses in one location, Landers Market. The four issues that remained to be resolved were hiring, training and supervision of clerks; division of advertising costs; maintenance costs of the market; and air temperature. Detailed descriptions of each alternative were provided. In addition, qualitative labels (A through I) were provided for each alternative within each issue so that subjects could refer to these labels instead of repeating the full alternative description (see Table 1).

Subjects in the low-content condition were similarly told that they were engaged in a negotiation task and also assigned roles in a task structurally equivalent to Landers Market, but without the detailed information about their roles, or the issues. They were told they had to negotiate on four issues (1 through 4), each issue having nine alternatives (A through I). They were given no other information about the roles except their own payoff schedule, which, like in the high content condition, they could not directly reveal (see Table 1). This effectively altered and reduced the search space by reducing the possibility of substantiation operators. However, all other negotiation behaviors (i.e., offers, information exchange regarding preferences and priorities, procedural comments, etc.) were relevant and appropriate in the low content condition.

Research has demonstrated that the way the task is viewed (e.g., cooperative vs. competitive) can serve as a cue regarding how to solve the problem (Eiser & Bhavnani, 1974; Larrick & Blount, 1997; Thompson & DeHarpport, 1998). If participants in the low content condition viewed the task as a puzzle to be jointly solved (a cooperative task) rather than a negotiation (a more competitive task) they would be less likely to engage in distributive behaviors than would high content participants. Thus, we took several steps to ensure that participants in the low task content condition would view the task as a negotiation. First, the task was presented as a "negotiation" in both high and low content

conditions. The task was referred to as a negotiation a minimum of four times in the experimental instructions and participants were consistently referred to as negotiators, regardless of task content condition. Second, outcomes were referred to as "profit points," implying individualistic concerns. Finally, as discussed above under Procedures, all subjects were told their "primary objective" was to maximize their individual profit points. This individualistic orientation was reinforced when participants were asked to report their "primary objective" in a manipulation check in the pre-negotiation questionnaire.

Negotiation Tactics. After completion of the pre-negotiation questionnaire, subjects in the tactics-present condition were separated so that they could not hear or see one another. They were then given a handout with descriptions and examples of six negotiation tactics (used in Weingart et al., 1996). Two integrative tactics (do not assume a zero-sum game, trade-off issues), two distributive tactics (appear firm, use persuasive arguments) and two equivocal tactics (exchange information, set high aspiration levels) were provided[5] (see Appendix A).

After reading the handout, subjects were asked to write the meaning of each tactic in their own words without referring to the handout. When they finished, the experimenter referred the subjects back to the handout to correct any incorrectly recalled tactics. If necessary, verbal instructions were provided by the experimenter to further explain the tactics.

Outcome Measures

Pareto Optimality. Pareto optimality was treated as a dichotomous variable (optimal/nonoptimal). Agreements were considered Pareto optimal when no other agreements existed that improved the profit points for one party without diminishing the profit points for the other party.

Pareto Efficiency. Pareto efficiency was defined by proximity of the outcome to Pareto optimality. The measure for Pareto efficiency was calculated as follows (see Figure 1):

$$\text{Pareto Efficiency of Joint Outcome } X = 100^{*}\ 1 - \left[\frac{N_b}{N_b + N_w}\right]$$

where,

- X = Some negotiated joint outcome.
- N_b = The number of solutions that were *strictly better* than joint outcome X (i.e., worth more points) for at least one party, but not worse (i.e., worth fewer points) for the other party.
- N_w = The number of solutions that were *strictly worse* than the joint outcome X for both parties (Clyman, 1995; Tripp & Sondak, 1992).

A perfectly integrative solution (i.e., one from the Pareto optimal frontier) received a Pareto efficiency score of 100. Dyads who impassed, a joint outcome score of 198,

received a Pareto efficiency score of 0 because *no* solutions existed that were worse for both parties. Because this variable was negatively skewed (skewness = −2.40), an arcsine transformation was employed to reduce the skewness before use (skewness after transformation = −1.89).

Two dyads chose to impasse in this study. These dyads were included in the analysis because their decision to impasse was made with full information regarding the consequences of that decision. Negotiators were aware they had the option to impasse, they knew the number of points they would receive if they chose that option, and they knew they could continue negotiating if they so desired.

Process Measures

Negotiation behavior was examined using the dyads' verbal interaction coded directly from the videotapes of the negotiation. The coding scheme, used in Weingart et al. (1996), identified integrative and distributive tactics. A set of general rules was provided to the coders, including setting the speaking turn as the unit of analysis while allowing multiple codes to be assigned to each speaking turn.[6] No more than one code was assigned to a single subject-verb-object set.

The coding scheme identified multiple negotiating behaviors, including different types of offers, information exchange, substantiation, procedural comments, and reactions. These behaviors were subdivided into a total of fourteen subcategories reflecting distributive, integrative, and neutral tactics. The distributive tactics focused on single-issues or positions on those issues. The integrative tactics focused on multiple issues and priorities across those issues. The neutral tactics included those that were not expected to influence joint outcome. The categories employed are shown in Table 2 and identified below in italics. Definitions and examples of each tactic are included in Table 3.

Distributive tactics included single-issue offers (*1-offer*), statements of preferences within single-issues (*1-preference*), questions about single-issue preferences (*1-question*), substantiation of position (*subinfo*), and questions about substantiation (*subquestion*). Two procedural comments were also considered distributive: suggestions to discuss one-issue at a time (*1-discuss*) and to compromise within an issue (*1-compromise*). Integrative tactics included multi-issue offers (*multioffer*), statements of preferences/priorities across multiple issues (*multipreference*), and questions about multi-issue preferences/priorities (*multiquestion*). Integrative procedural comments included packaging issues or discussing sets of issues simultaneously (*multidiscuss*) and using delayed reciprocity, offering a current concession for an unspecified concession in the future (*future-reciprocity*). Finally, there were two neutral categories included: positive reactions (*pos-reaction*) and miscellaneous (*misc*) remarks.

Coding Process. Before coding, the videotapes were unitized into speaking turns. A second coder also unitized a subset of the data, demonstrating a high level of unitizing reliability (Guetzkow's $U = 0.09$; Guetzkow, 1950). A total of 9,754 speaking turns were identified in the data set.

Three research assistants participated in approximately 60 hr of training in the use of

TABLE 2
Behavioral Coding Categories

General category	Subcategory	
	Distributive	Integrative
Offers	1-offer	Multi-offer
Information exchange		
Provide information	1-preference	Multi-preference
Ask for information	1-question	Multi-question
Substantiation	Sub-info	n/a
	Sub-question	n/a
Procedural comments		
Suggest issue discussion	1-discuss	Multi-discuss
Suggest compromise	1-comprimise	n/a
Concede for future reciprocity	n/a	Future-reciprocity
Neutral comments		
Positive reactions	n/a	n/a
Miscellaneous	n/a	n/a

the coding scheme. When interrater reliability among pairs of the coders reached an acceptable level on each of the categories (Cohen's kappa = .80; Cohen, 1960), they proceeded to code the data. The coders progressed through the data set in the following manner. Randomly determined pairs of the three coders independently coded each dyad. After completing a set of dyads (between 3 to 5), the coders compared their coding and reconciled any disagreements by reviewing that segment of the videotape together, producing a single set of codes for each dyad. Negotiation behavior was determined from analyses of these finalized codes.

Before reconciliation of coder disagreements, intercoder reliability was computed for each category. Cohen's kappa was calculated using 28 randomly selected dyads (4302 codes) obtained from a larger data set that included the groups from this study. Values for each of the categories ranged from kappa = .75 to kappa = .89.

Using the behavioral categories presented in Table 3, the relative frequency of each type of behavior (number of occurrences of that behavior divided by the total number of behaviors within that dyad) was compared across conditions to test the hypotheses. Relative rather than absolute frequencies were used to control for the overall length of each negotiation, which might reflect verbosity rather than a specific negotiation tactic. Relative frequencies of negotiation behaviors were logit transformed before data analysis to avoid the possibility of spurious correlations when using proportions (Cohen & Cohen, 1983).

VI. RESULTS

Manipulation Checks

Negotiation Tactics. Before negotiating, subjects in the tactics-present condition were asked to recall the meaning of each of the negotiation tactics in their own words. If a tactic

TABLE 3
Behavioral Coding Categories and Examples

Subcategory	Definition	Example
Distributive		
1-offer	An offer on only one issue	''What would you say for D in Clerks?''
1-preference	State preferred alternative within an issue	''For Temperature, I really prefer level E . . .''
1-question	Ask for preferred alternative within an issue	''Well, what alternative do you want for clerks?''
Sub-info	Arguments for own position, arguments against other's	''If my temperature is too high, all of my food will spoil!''
Sub-question	Question the arguments presented	''Do you know how messy your flowers are''
1-discuss	Suggest addressing one issue at a time	''Let's deal with advertising first . . .''
1-compromise	Suggest a compromise or willingness to concede on an issue alternative	''I think we each have to give up something on Advertising . . .''
Integrative		
Multi-offer	An offer on N > 1 issues under discussion	''What if we do B on Clerks and D on maintenance?''
Multi-preference	State which issues are more or less important to one's self	''Clerks is the most important issue to me . . .''
Multi-question	Ask which issues are more or less important to the other party	''What is your most important issue?''
Multi-discuss	Suggest discussion of N > 1 issues at the same time	''What don't we try to trade-off between Clerks and Maintenance?''
Future-reciprocity	Suggest a concession to be made in exchange for an unidentified future concession	''I will give you that on Temperature, but I need something in return . . .''
Neutral		
Pos-reaction	Positive reactions	''That sounds good to me . . .''
Misc	Off-task and low frequency comments	''Did you take Professor Lerch's course?''

was incorrectly recalled, the experimenter reviewed that tactic to ensure that the subject accurately understood its meaning. Results showed that on average subjects incorrectly recalled less than one of the six tactics ($M = 0.95$, $SD = 0.89$). After correction, the experimenter was confident that all the subjects in the tactics-present condition understood all of the tactics.

Task Content. Time taken to complete the negotiation provided an indirect manipulation check of the task content manipulation and was indicative of search extent. If decreasing the task content significantly simplified the problem by reducing the demands of the task, then the subjects in the low-content groups should be able to reach an agreement in less time. Results showed that time taken (in minutes) by the low-content groups ($M = 12.8$, $SD = 8.95$) was indeed less than the high-content group ($M = 28.8$, $SD = 15.56$; $t(53) = 5.97$, $p < .001$).[7]

Overall Outcomes and Behaviors

Individual outcomes ranged from 99 points (two dyads impassed) to 345 points (M = 255.75, SD = 48.63, n = 122). Pareto efficiency scores ranged from 0 (impasse) to 100 (Pareto optimal) (M = 87.02, SD = 22.50) with 27 of 61 dyads (44.3%) achieving Pareto optimal outcomes.

Replication: Effect of Negotiation Tactics

To determine if negotiation tactics influenced Pareto efficiency and the relative frequencies of behavior, a series of two-way ANOVAs was performed (results for task content and the interaction are presented later). The results of the negotiation tactic manipulation replicated the relevant results of the Weingart et al. (1996) study for Pareto efficiency. Negotiation tactics led to higher Pareto efficiency scores ($F(1,57) = 4.38$, $p < .05$). This was achieved because negotiation tactics led to higher frequency use of two of the integrative processes (multipreference, $F(1,57) = 10.42$, $p < .01$; multiquestion, $F(1,57) = 7.51$, $p < .01$) that resulted in the achievement of higher Pareto efficient solutions (see Table 4 for correlations between the tactical behaviors and Pareto efficiency).[8] A hierarchical regression using Baron and Kenney's (1986) analytic approach verified that "priority exchange" (a combination of multipreference and multiquestion)[9] mediated the effect of tactics on Pareto efficiency. Dummy variables representing the manipulations were entered at Step 1 and the priority-exchange mediator was entered at Step 2. Results showed that the beta weight associated with the negotiation tactic manipulation dropped from .62 ($p < .01$) in Step 1, to .41 (*ns*) in Step 2 (change in β = .21, $t(57) = 9.13$, $p < .001$), and the *priority-exchange* coefficient was significant in Step 2 ($\beta = 0.26$, $p < .05$). Figure 2 summarizes these results.

There was no negotiation tactic manipulation effect on substantiation frequency ($F(1,57) = 1.36$, *ns*)—substantiation did not differ between groups with tactics or those without. Substantiation was negatively related to Pareto efficiency (see Table 4). And, substantiation was the most common process across both conditions (tactics-present, M = 15.61%; tactics-absent, M = 18.63%).

There was no effect of the tactic manipulation on the achievement of Pareto optimal solutions [$\chi^2(1) = .01$, *ns*]. Thirteen dyads (43.3%) achieved Pareto optimal solutions in the tactics-present condition, whereas 14 (45.2%) achieved Pareto optimal solutions in the tactics-absent condition.

Hypothesis Tests: Effect of Task Content

Impact of Task Content on Negotiation Outcome. Hypothesis 1 predicted that low-content dyads would be more likely to achieve Pareto optimal solutions than high-content dyads. Twenty-four low-content dyads (77.4%) agreed upon Pareto optimal solutions whereas only three high-content dyads (10.0%) reached optimality. A χ^2 analysis showed a significant effect for task content on Pareto optimality [$\chi^2(1) = 28.09$, $p < .001$],

TABLE 4
Correlations Between Transformed Relative Frequencies of Tactical Behaviors and Outcomes[a,b]

	Pareto efficiency	Pareto optimality
Distributive behaviors		
1-offer	−.04	−.40**
1-preference	−.29**	−.64***
1-question	.26*	−.14
Sub-info	−.53***	−.86***
Sub-question	.16	.03
1-discuss	−.15	−.58***
1-compromise	.25*	.05
Integrative behaviors		
Multi-offer	.61***	.51***
Multi-preference	.54***	.59***
Multi-question	.51***	.63***
Future-reciprocity	.40***	.16
Multi-discuss	.32**	.09
Neutral behaviors		
Pos-reaction	.40***	.41***
Misc	.36**	−.01

[a]n = 61 dyads.

[b]For correlations with Pareto efficiency, relative frequency of behavior = (absolute frequency/total behavior). For correlations with Pareto optimality, relative frequency of behavior = (absolute frequency/[total behavior-substantiation]), except for substantiation where relative frequency = (absolute frequency/total behavior).

*$p < .05$, **$p < .01$; ***$p < .001$;

supporting Hypothesis 1. Why did this occur? The answer is found in the subsequent analyses of underlying behaviors. (Results for Hypotheses 1 through 6 are summarized in Figure 3.)

Impact of Task Content on Negotiation Process. To test the effects of task content on behaviors, we employed a two-step approach to the analyses. First, we examined the impact of task content on substantiation (subinfo) as a proportion of total behavior within a dyad. Second, we examined the impact of task content on each of the other tactical

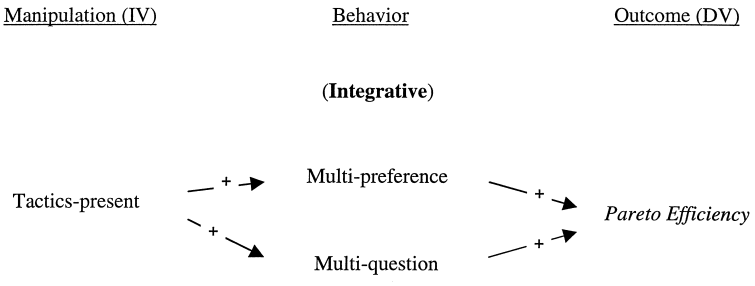

Figure 2. Summary of results: Negotiation tactics (replication).

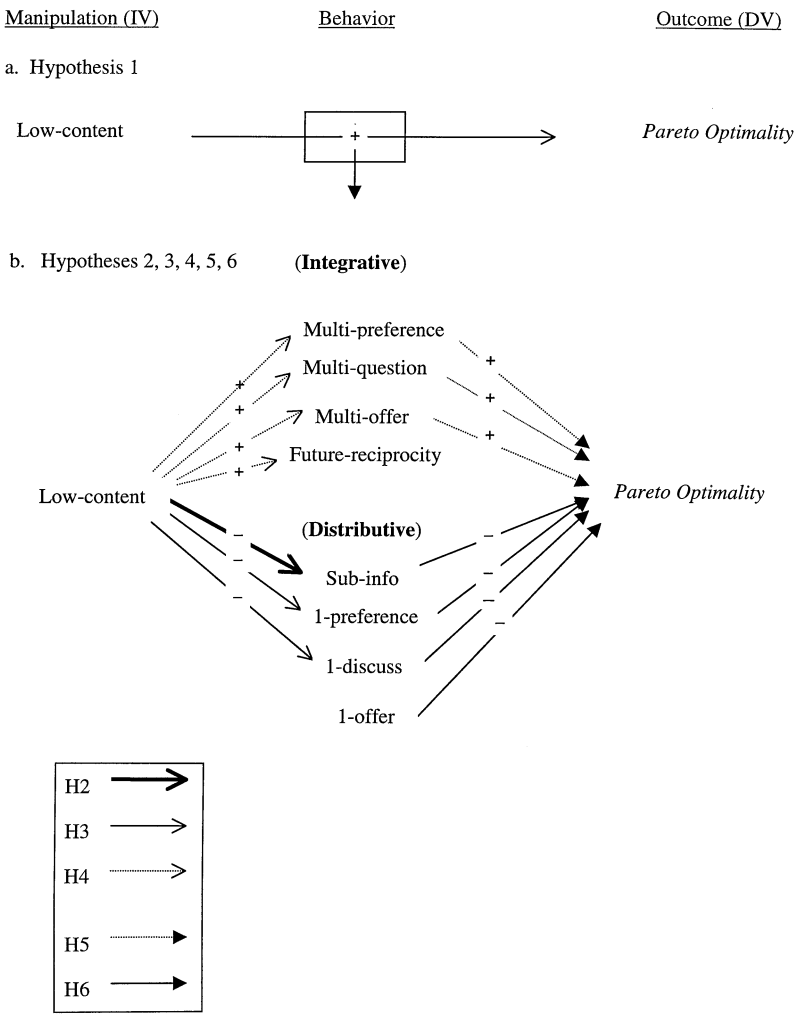

Figure 3. Summary of results: Task content.

behaviors. The relative frequencies of the other tactical behaviors were calculated by dividing the absolute frequency of each category by the sum of all of the other categories *excluding* substantiation.

This approach was employed due to the large difference in amount of substantiation expected across the task content conditions. Including substantiation in the denominator of the other relative frequencies might result in spurious correlations with task content due to changes in the denominator of the proportion (associated with differences in substantiation across content conditions) rather than changes in the numerator. Therefore, to avoid potential Type I errors, substantiation was analyzed separately from the other behaviors. This treatment of substantiation was used for all analyses involving task content effects.

TABLE 5
Means and Standard Deviations of Absolute Frequencies of Behavior

	Task content					
	High		Low		Total	
Behavior	M	SD	M	SD	M	SD
Distributive						
1-offer	4.60	2.85	6.40	6.39	5.52	5.01
1-preference	13.64	4.69	6.62	4.05	10.07	5.60
1-question	3.42	1.75	4.92	3.15	4.18	2.65
Sub-info	32.36	13.56	2.42	3.03	17.14	17.92
Sub-question	7.06	3.82	10.32	3.95	8.72	4.19
1-discuss	3.60	1.78	2.76	2.19	3.17	2.03
1-compromise	0.23	0.38	0.51	0.68	0.37	0.57
Integrative						
Multi-offer	1.90	2.31	7.25	5.03	4.62	4.74
Multi-preference	2.42	4.90	5.33	4.80	3.90	5.03
Multi-question	0.74	1.25	3.96	4.14	2.38	3.46
Future-reciprocity	0.10	0.23	0.42	0.68	0.27	0.53
Multi-discuss	0.45	0.78	0.96	1.53	0.71	1.24
Neutral						
Pos-reaction	9.73	4.22	19.19	5.91	14.54	6.99
Misc	19.75	6.88	28.93	8.70	24.42	9.07

Low-content dyads engaged in less substantiation than high-content dyads ($F(1, 57) = 172.02$, $p < .001$), providing strong support for Hypothesis 2. When substantiation behaviors were excluded from the analysis, two distributive behaviors were engaged in less frequently by the low-content dyads than the high-content dyads: 1-preference ($F(1, 57) = 67.08$, $p < .001$) and 1-discuss ($F(1, 57) = 17.27$, $p < .001$). This provided support for Hypothesis 3. Providing support for Hypothesis 4, low-content dyads engaged in greater frequencies of four of the five integrative behaviors than high-content dyads: multioffer ($F(1, 57) = 25.95$, $p < .001$), multipreference ($F(1, 57) = 9.58$, $p < .01$), multiquestion ($F(1, 57) = 20.41$, $p < .001$), and future-reciprocity ($F(1, 57) = 8.29$, $p < .01$). Low-content dyads also engaged in greater frequencies of the neutral behavior, pos-react ($F(1, 57) = 13.71$, $p < .001$). For illustrative purposes, Table 5 provides cell means and standard deviations of absolute frequencies of behavior for the task content conditions.

Impact of Negotiation Process on Outcome. Hypothesis 5 predicted that the increased use of integrative tactics would result in a *higher* likelihood of achieving Pareto optimality whereas Hypothesis 6 predicted that the increased use of distributive tactics would result in a *lower* likelihood of achieving Pareto optimality. A series of correlation analyses was conducted to determine which behaviors were associated with Pareto optimality.

The correlations in Table 4 showed that three integrative behaviors (multioffer, multipreference, and multiquestion) were significantly positively correlated with Pareto optimality, supporting Hypothesis 5. In addition, four distributive behaviors (1-offer, 1-preference, subinfo, and 1-discuss) were significantly negatively correlated with Pareto

optimality, providing support for Hypothesis 6. One neutral behavior, pos-react, was also significantly positively related with Pareto optimality.

Mediation Roles of Integrative and Distributive Behaviors. To test whether the distributive and integrative behaviors mediated the effects of task content on Pareto optimality (Hypothesis 7), the Baron and Kenney (1986) approach was again employed. For this analysis, logistical regression analysis was used because the dependent variable, Pareto optimality, was dichotomous.

After determining task content was significantly related to Pareto optimality and eight potential mediators [three distributive behaviors (subinfo, 1-preference, 1-discuss), four integrative behaviors (multioffer, multipreference, multiquestion, future-reciprocity) and 1 neutral behavior (pos-react)], intercorrelations among the eight proposed mediators were examined. As in the prior test for mediation, multipreference and multiquestion ($r = .85$, $p < .001$) were combined into one category labeled "priority-exchange" to reduce problems of multicollinearity. Next, a decision was made to analyze the mediating effects of substantiation and the other tactical behaviors separately. This was conducted because substantiation was the independent variable most highly correlated with the other independent variables in the analysis (average $r = .48$).

To test the mediating effects of the tactical behaviors, logistical regression analysis was performed with Pareto optimality as the dependent variable (see Table 6). In Equation (1), dummy variables representing the manipulations were entered. In Equation (2a) the behavioral variable substantiation was added and its coefficient was examined for significance. In Equation (2b) all other behavioral variables were added and their coefficients were examined for significance. Finally, the content coefficient was compared across the Equations (1) and (2) (a and b) to determine whether it's value dropped when mediators (i.e., behaviors) were included in the equation.

Results showed that when substantiation was included in the equation (Table 6, Equation (2a)), the substantiation coefficient was significant (subinfo coeff $= -2.16$, $p < .01$) and the coefficient associated with the content manipulation dropped from 3.43 ($p < .001$) to -0.42 (*ns*). When the other behaviors (1-preference, 1-discuss, multioffer, priority exchange, future-reciprocity, and pos-react) were added to the equation with the manipulations (Table 6, Equation (2b)) four of the six behaviors were significant and in the predicted direction (excluding future-reciprocity and pos-react) and the content variable dropped to non-significance. Together these results provide strong support for Hypothesis 7. Both substantiation alone and the combination of the other tactical behaviors fully mediated the effect of task content on Pareto optimality (see Figure 4).

Interaction Effects

Although not hypothesized, the interaction between negotiation tactics and task content was examined to determine whether it influenced negotiation outcomes or behaviors. First, a categorical data analysis showed there was no interaction between negotiation tactics and content conditions on Pareto optimality [$\chi^2(1) = 0.62$, *ns*]. Second, a two-way

TABLE 6
Logistic Regression Results: DV = Pareto Optimality[a]

	Equation 1	Equation 2a	Equation 2b[b]
Constant	−2.17***	−3.20**	47.68
	(.70)	(.89)	(41.74)
Negotiation tactics	−.06	−.38	−8.00
	(.07)	(.79)	(5.70)
Task Content	3.43***	−.42	−14.48
	(.74)	(1.22)	(12.38)
Sub-info		−2.16**	
		(.80)	
1-preference			−29.90*
			(24.04)
1-discuss			−13.27*
			(10.18)
Multi-offer			18.64***
			(14.71)
Priority Exchange			15.95***
			(12.45)
Future-reciprocity			2.10
			(3.97)
Pos-react			4.23
			(6.79)
Likelihood ratio test (χ^2)	31.14***	40.09***	70.96***
Degrees of freedom	2	3	7

[a]Standard errors are in parentheses. Significance levels of the coefficients are determined using the Wald statistic.

[b]When the absolute value of the coefficient in a logistic regression becomes large (which is the case for almost all the coefficients in Equation 2b), the estimate of the standard error is too large, resulting in a Wald statistic that is too small, leading to a possibly false non-significant result. Rather than relying on the Wald statistic for hypothesis testing in this situation, models were built with and without each variable with a high coefficient and the hypothesis tests were based on the change in the log likelihood (Hauck & Donner, 1977).

*$p < .05$, **$p < .01$; ***$p < .001$.

ANOVA revealed no interaction of task content and negotiation tactics on Pareto efficiency ($F(1,57) = 3.37$, *ns*). Finally, a series of two-way ANOVAs using the recalculated relative frequencies (without substantiation) of tactical behaviors as dependent variables revealed one interactive effect of negotiation tactics and task content, miscellaneous comments ($F(1,57) = 5.34$, $p < .05$).

VII. DISCUSSION

The purpose of this study was to further our understanding of the processes that inhibit the achievement of Pareto optimal solutions in a negotiation problem solving task. Previous research shows, and the current study replicates, that although negotiators engage in more integrative behavior when potentially relevant negotiation tactics are available, the dominant distributive behavior, substantiation, does not change (Weingart et al., 1996). And

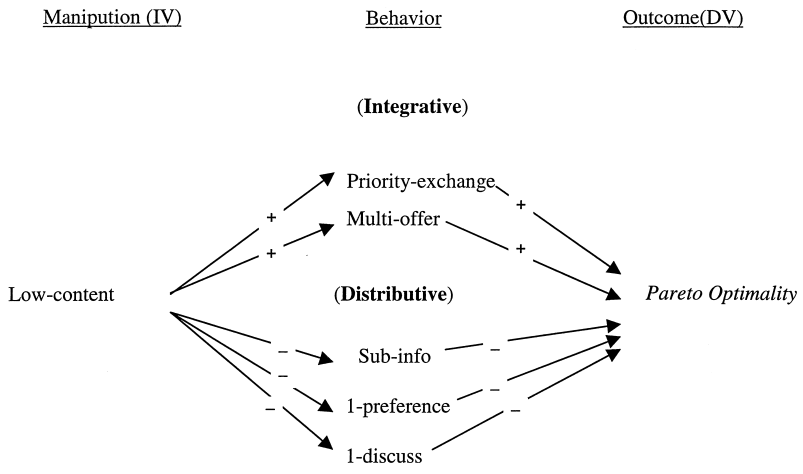

Figure 4. Summary of significant mediation results for Task content.

although Pareto efficiency of agreements improves as a result, negotiators with negotiation tactics are no more likely to achieve Pareto optimality than those without (Weingart et al., 1996).

The current study identified a key distributive behavior, substantiation, as interfering with the discovery of optimal agreements. This was revealed by reducing the descriptive content of the task. When the content of the negotiation task description was reduced, the problem space was altered such that the basis for content-based substantiation as a negotiation tactic was also reduced. The effect on the negotiation results was dramatic: twenty-four of 31 dyads (77%) in the low-content condition achieved Pareto optimal solutions, as compared to three of 30 dyads (10%) in the high-content condition.

Thus, an apparent discontinuity exists. On one hand, the availability (and use) of appropriate negotiation tactics undoubtedly improves the Pareto efficiency of negotiation outcomes. These tactics can change behavior, and the behavioral changes improve negotiation results. This was a main effect found in the prior study and replicated in the current study. On the other hand, the achievement of Pareto optimality occurred independent of the presence of such tactics. Achievement of Pareto optimality occurred *regardless* of whether dyads had seen a list of these tactics. The jump to Pareto optimality seems to be a direct consequence of reducing task content. However, this begs the question: what changed when the task content was reduced?

Again, what changed was the set of behaviors engaged by the negotiators. Insight into this explanation can be gained by comparatively examining the results of the tests of mediation predicting Pareto efficiency and Pareto optimality. In particular, the results are reviewed by investigating the behaviors that accounted for the significant links between the manipulations and joint outcomes. That is, what behaviors did the manipulations differentially effect, and how did those behaviors influence Pareto efficiency and optimality?

Examining the behaviors that significantly mediated the manipulation-outcome relationships, we see that when subjects were presented with a list of negotiation tactics, Pareto efficiency improved, largely due to an increase in the frequency of information exchange regarding one's priorities across issues (priority exchange: multipreference and multiquestion) (see prior Figure 2). Interestingly, the presence of the tactics list did not influence the achievement of Pareto optimality, although the key integrative behavior influenced by the presence of the list, priority exchange, was significantly related to Pareto optimality. In addition, the list of tactics did not alter the frequency of any distributive behavior—behaviors that generally interfered with achieving higher Pareto efficiency scores as well as achieving Pareto optimal solutions. One explanation is that the list of tactics may have subtly reinforced the subjects' default tactic of using distributive assumptions and behaviors, thus no changes in distributive behaviors were observed.

When considering the effects of reducing task content, the picture changes radically. A reduction in task content increased the achievement of Pareto optimal solutions (and by extension, the Pareto efficiency of those outcomes as well), and did so in a behaviorally consistent manner. An increased use of two integrative behaviors (priority exchange and multi-issue offers) and a decreased use of three distributive behaviors (substantiation, information sharing of preferences within an issue, and procedural comments about discussing one issue at a time) accounted for this relationship (Figure 4). Of the three distributive behaviors, the mediating role of substantiation was clearly dominant in that when considered alone it fully mediated the relationship between task content and Pareto optimality. The net result was the achievement of Pareto optimality by 77% of the negotiating dyads. Thus, the fundamental differences in behaviors for achieving Pareto optimality versus merely increasing Pareto efficiency was the *increase* in frequency of *one* additional integrative behavior (making multi-issue offers) and the *decrease* in frequencies of *three* distributive behaviors (substantiation, 1-preference, 1-discuss).

As expected, substantiation was significantly reduced in the low content condition, accounting for only 2.4% of total behavior. The nature of substantiation in the low content condition was primarily based on the few remaining substantive contextual cues relating to the achievement (or lack of achievement) of profit or agreement. Examples of low-content substantiation include: "I need it to make a respectable profit," "It's still better for me not to do it," "Because it's a compromise for both of us," "We can sacrifice, because if we keep fighting for points we won't reach an agreement," "I found that this is the optimal thing for both of us . . . I don't think we can get any better than this without one person getting worse off."

The increased use of multi-issue offers by negotiators working on a low-content task might be related to the availability of cognitive resources in that condition. The reduction of semantic content might have reduced the overall cognitive load such that more resources were available to discover, consider, and engage multi-issue offers. Crafting multi-issue offers is not a trivial tactic as a negotiator must, at the least, consider the differential importance of the issues when deciding how to construct the offer. Negotiators who are also concerned about making a multi-issue offer that might benefit the other party must also estimate the relative importance of the issues to that individual. In a sense,

considering multi-issue offers in the search for solutions is like crafting a macro-operator (Korf, 1985) or complex operators (Card, Moran & Newell, 1983), whereby previously independent operators (single-issue offers) are jointly associated and considered in the same context. As a result, the problem space search is reduced by having "partial methods" defined. In addition, this would facilitate the often difficult problem of apparently moving away from the goal for a single issue (i.e., accepting a lower return on one issue) but getting a total higher return on the multi-issue score.

It is not surprising that multi-issue offers are critical to the discovery of Pareto optimal solutions. When issues are packaged together in an offer, rather than considered sequentially, it is easier to arrange trades or concessions as negotiators search for packages that are mutually beneficial. In contrast, when issues are dealt with individually, negotiators tend to compromise on each issue sequentially. This makes the discovery of potential tradeoffs more difficult, resulting in a lower joint benefit (Thompson, Mannix, & Bazerman, 1988; Weingart, Bennett, & Brett, 1993).

As making multi-issue offers facilitates achieving Pareto optimality, substantiation seems to be a dominant behavior that interferes with achieving it. Substantiation, by its very nature, is a seductive strategy that seems not only to be a default behavior, but a persistent one that feeds upon itself and the cognitive resources of the negotiators. Substantiation leads to more substantiation (Weingart et al., 1996). As the various substantiation arguments unfold, more and more cognitive resources must be tapped to sustain (or escalate) the exchange. Outcomes improve with knowledge, but the final leap to the discovery of optimality does not occur. By reducing the semantic content upon which substantiation is based, opportunities for substantiation were consequently reduced. The crafting of complex, macro-operators, which are directly correlated with the achievement of Pareto optimality, reduced the problem space search effort. In addition, two other distributive behaviors, negatively correlated with the achievement of Pareto optimality, were also reduced—sharing information about preferences within an issue and discussion of addressing one issue at a time. These tactics typify a single-issue, distributive approach to negotiation. Thus, as low-content negotiators moved away from positional substantiation arguments, they also shifted their focus away from tactics that only considered one issue at a time.

To illustrate the point, protocol segments from each of the two task content conditions are presented in Tables 7 and 8. In Table 7, a protocol segment from a dyad negotiating in the high-content condition is presented, whereas Table 8 contains a protocol segment from a dyad negotiating in the low-content condition. In each table, the fundamental operators proposing specific solutions (as issues and their alternatives) are highlighted in bold, and the more complex, multi-issue macro-operators are starred. As in all the protocols, both negotiating dyads engage in search consistent with the negotiation task. However, it can be seen that the high-content protocol reveals much substantiation (e.g., "I don't want my customers coming in hot and they aren't going to want coffee" [statement 1], "But you have those messy people. . . " [statement 16], "People are going to want to get warmed up and stuff. . . " [statement 25]). Procedural comments about discussing one issue at a time (e.g., statements 13–15) and information about preferences

TABLE 7
Protocol Segment for High-Content condition

Turn	Speaker	Code	Protocol
[1]	Baker	sub-info	I don't want my customers coming in hot and they aren't going to want coffee.
[2]	Florist	sub-info	Like you said, a couple of degrees isn't that much when you are a person, when you are a flower it's probably important.
[3]	Baker	misc	So you put a special sunlight on them or a sunlamp. What's wrong with that?
[4]	Florist	misc	I don't know if you can do that.
[5]	Baker	sub-ques, sub-info	Do they desire special attention? They are going to have special treatment.
[6]	Florist	sub-info	Like we said a couple of degrees doesn't make a difference. What's the difference between 72 and 74° when you are a person, is it going to make that much of a difference to you. When you are a flower . . .
[7]	Baker	post-react	Yes
[8]	Florist	**1-offer**	**How's 73?**
[9]	Baker	sub-info	That's 2° different for me. That's like 8° difference for me. A general temperature for anyone is like 71–72.
[10]	Florist	**1-offer**	**73**
[11]	Baker	**1-offer**	**72**
[12]	Florist	sub-info	I would love to give in on this, but these are my flowers, this is my business.
[13]	Baker	1-discuss	Let's move on to something else then.
[14]	Florist	pos-react	OK
[15]	Baker	Sub-info	Maintenance, you do take up more space than I will. Won't you?
[16]	Florist	Sub-info	But you have those messy people, eating, leaving their food there. People will just buy my stuff and leave. They take their flowers and go.
[17]	Baker	sub-info	Plants are messy, dirt, soil. All that stuff that goes with it.
[18]	Florist	sub-info	We're not a flower shop. We are just cutting flowers.
[19]	Baker	misc	If you don't want to give away your temperature . . .
[20]	Florist	neg-react	If you aren't willing to give on maintenance. The temperature I just can't
[21]	Baker	**1-offer**	**You 70% and me 30%**
[22]	Florist	neg-react **1-offer**	I don't think that will work. **I would be willing to go 50–50 on it.**
[23]	Baker	Future-reciprocity	I want something given to me if I have to give up temperature.
[24]	Florist	misc	Well that is. Considering you are . . .
[25]	Baker	sub-info, **1-offer**	I don't have cold drinks, I have espresso and coffee and hot drinks. People are going to want to get warmed up and stuff. Attract the morning people. **How about 40–60?**
[26]	Florist	sub-info	You have the whole use of the common area with all the tables. I really get no use out of that.
[27]	Baker	sub-info	My customers get to but your flowers and eat my food.
[28]	Florist	sub-info	But then they sit at your tables.

Note: Negative reactions (neg-react) were coded but not analyzed due to their low frequency of occurrence. Fundamental operators proposing specific solutions are highlighted in bold.

TABLE 8
Protocol Segment for Low-Content Condition

Turn	Speaker	Code	Protocol
[1]	Negotiator 1	1-discuss	So where do you want to start? Let's start with Issue 1.
[2]	Negotiator 2	**multi-offer***	**I'll give you E on every issue.**
[3]	Negotiator 1	misc	E on every issue?
[4]	Negotiator 2	misc	Do you want to do that?
[5]	Negotiator 1	neg-react	E on every issue? No.
[6]	Negotiator 1	misc	Yes.
[7]	Negotiator 2	misc	Hmmm.
[8]	Negotiator 2	**1-offer**	**What about E on Issue 1**
[9]	Negotiator 1	**1-offer**	E on issue 1? **How about H?**
[10]	Negotiator 2	neg-react **1-offer**	On issue 1? No. **How about A on Issue 1?**
[11]	Negotiator 1	neg-react **1-offer**	No. **All right F?**
[12]	Negotiator 2	**1-offer**	**D?**
[13]	Negotiator 1	**1-offer**	**E?**
[14]	Negotiator 2	pos-react	E. OK, I'll give you E on Issue 1
[15]	Negotiator 1	pos-react	OK E on issue 1.
[16]	Negotiator 2	pos-react	OK
[17]	Negotiator 1	pos-react	OK
[18]	Negotiator 2	**1-offer,** 1-pref **1-offer**	**How about E on issue 2?** I would really like C on Issue 2. **How about A on issue 2.**
[19]	Negotiator 1	pos-react	OK, sounds good.
[20]	Negotiator 2	**1-offer**	OK. **How about A on issue 3?**
[21]	Negotiator 1	neg-react, multi-pref 1-pref, multi-discuss	No. I'm looking. Issue 3 is very important to me. I'm looking more along the lines of H on Issue 3. If we could possibly do a trade.
[22]	Negotiator 2	misc	OK, hold on.
[23]	Pause		
[24]	Negotiator 2	**multi-offer***	OK, **I'll give you H if you give me B on Issue 4. B or A.**
[25]	Negotiator 1	misc	OK, you'll give me H on Issue 3 if I give you A on 4.
[26]	Negotiator 2	misc	Yes.
[27]	Negotiator 1	pos-react	OK
[28]	Negotiator 2	misc	Hold on.
[29]	Negotiator 1	misc, **multi-offer***	Hold on, let me think about this. It's going to be H on 3 and A on 4. **How about H on 3 and E on 4?**
[30]	Negotiator 2	neg-react multi-pref multi-pref	No way. Issue 4 is like second most important. Issue 1 is most important to me.
[31]	Negotiator 1	multi-ques	Issue 1 is most important to you?
[32]	Negotiator 2	multi-pref	Least important is Issue 2, which we've already taken care of for both of us. Issue 2 is fine.
[33]	Negotiator 1	pos-react	OK
[34]	Negotiator 2	**multi-offer***	**I would like to go D on Issue 1 and B on issue 4 and H on Issue 3.**
[35]	Negotiator 1	pos-react **1-offer**	OK, I'm good with Issue 3 and Issue 1. **Issue 4 I think we should make D.**

Note: Negative reactions (neg-react) were coded but not analyzed due to their low frequency of occurrence. Fundamental operators proposing specific solutions are highlighted in bold. More complex, multi-issue macro-operators are marked with asterisks.

within an issue (none in this segment) also occur, but multi-issue offers do not. On the other hand, an examination of the low-content protocol reveals a lack of substantiation and an emergence of multi-issue offers (e.g., "I'll give you E on every issue" [statement 2], "Ok, I'll give you H if you give me B in issue 4. . . " [statement 24]).

In this example the differences between the significant behaviors can be clearly seen by taking the coded protocol segments and representing them in a form of state-transition diagram (Figure 5) In these diagrams, the significant subset of behaviors is shown as labeled nodes and the sequence of protocol segments mapped into the behaviors are shown as (numbered) arcs. The behaviors that should decrease to achieve Pareto optimality are shown on the left (i.e., substantiation, procedural comments about discussing one issue at a time, information about preferences within an issue), and the behaviors that should increase to achieve Pareto optimality are shown on the right (i.e., multi-issue offers). Figure 5a illustrates a typical high-content interaction including the lack of multi-issue offers and a preponderance of substantiation behavior. In contrast, Figure 5b illustrates a typical low-content interaction pattern in which substantiation diminishes and multi-issue offers are more common.

What does this study tell us about negotiation research? It is clear that the nature of the task affects the behaviors and outcomes of this typical negotiation case. Similar observations have been made by others in negotiation (e.g., Tutzauer, 1990) as well as in psychology in general (Jenkins, 1980; Neisser, 1976; Simon, 1981). The question one must address is the extent to which properties of the task account for variations in, and consequently explanations of, behavior and outcome. Even in our simple case, the waters were muddied by the cognitive demands of the task. Why did naive negotiators not achieve Pareto optimality even when they had the necessary and sufficient knowledge to do so?

The difficulty of the problem resides not only in the crafting of an inappropriate problem representation (zero-sum characterization), disproportionate and persistent use of particular operators (substantiation—fueled by the high-content task condition), and the subsequent cognitive resource problems of engaging in persistent substantiation behaviors, but also in the cognitive resources required to conduct critical problem solving behaviors (consideration and crafting of multi-issue offers). These problem solvers are indeed "stuck in a problem space" (Huguenard et al., 1989). These findings are consistent with those obtained by researchers investigating problem difficulty in other domains (e.g., Kotovsky, Hayes, & Simon, 1985) and are also consistent with experiments investigating the interactions between goal-generation strategies, resource constraints, and performance (Just, Carpenter, & Hemphill, 1996).

In addition, search for the/a solution is determined by the joint articulation of the search space that satisfies the constraint of both parties. Therefore, these results can also be viewed in the context of collaborative discovery, where critical behaviors underlie specific and successful search when two agents interact (e.g., Okada & Simon, 1997). The coordination of knowledge exchanges (as behaviors) help determine the propriety of the space and the operators defining alternative evaluations and solutions.

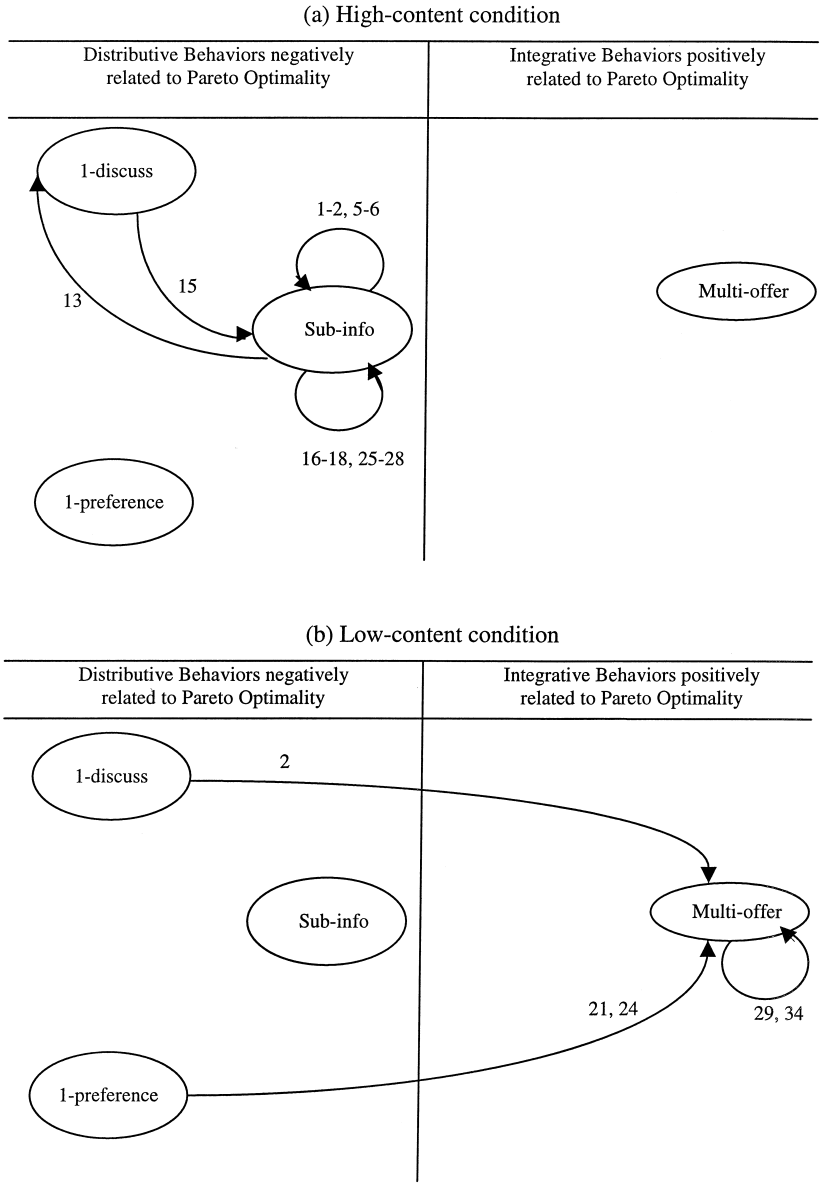

Figure 5. Diagrams of protocol segments.

Future Research

Previous negotiation research has not taken task differences into account. First, there has been little direct examination of differences in tasks. The task is usually treated as a given, with other variables being manipulated. One exception is Thompson's work comparing tasks composed of various combinations of integrative and distributive issues (Thompson,

1990a). The present research differs from Thompson's study in that it varies the semantic content (and thus the potential for substantiation) while holding the structure of the task constant, rather than varying the structure of the task itself. Thus the forms of the task in this study were isomorphic with respect to solution strategies.

Second, negotiation tasks used in previous negotiation research have typically been comparatively low in semantic content (e.g., Bazerman et al., 1985; Neale & Northcraft, 1986; Thompson, 1990a, 1990b). Given the differences in both negotiation behavior and joint outcome due to the task content in this study, we should be concerned with the generalizability of results from semantically lean tasks to tasks with semantically rich components, such as those found in most real world situations.

What does this study tell us about negotiation more generally? Negotiation, as any problem solving task, involves the discovery (or accessing) of knowledge about the task as well as the ability to apply that knowledge, an observation that is seemingly ubiquitous to the study of skilled problem solving (e.g., Larkin, McDermott, Simon, & Simon, 1980, Chi et al., 1981). As we have seen, negotiators can easily be trapped into inappropriate behaviors leading to suboptimal results if the task places excessive demands on their cognitive resources, even in the presence of tactics that can help them perform the task. However, reduction in task demands reduces the inappropriate application of distributive behaviors, permits the emergence of appropriate complex operators related to the agreement goal, and the ultimate discovery of optimal solutions. Does this mean that only the simplest negotiation tasks may be effectively solved? The answer, of course, is no. What is required is a systematic study of the knowledge that can be brought to bear to effectively reduce the task demands of complex negotiations and what conditions inhibit or facilitate their application (c.f., Nisbett, 1993).

To gain understanding of the type of knowledge required to reduce task demands, we should further examine groups in the high-content, tactics-present condition. Perhaps this group lacked knowledge that permits effective sifting of irrelevant surface features of the task and discovery of the fundamental structure underlying the type of problem at hand (Chi et al., 1981). In addition, they may have lacked meta-knowledge used to monitor the negotiation process itself to determine the contributions of the strategies and assumptions governing their search for a solution (Brown & DeLoache, 1978; Chi, 1981; Davidson, Deuser, & Sternberg, 1994). Thus, knowledge can be a most effective mechanism to reduce task demands, but it must be the right kind of knowledge. Future research should present different sets of tactics to negotiators, within different levels of mastery of the tactics, in an effort to explicate the tradeoffs and effects of knowledge, practice, and the acquisition of task-related skill.

Additional research is needed to differentiate between the role of previously held knowledge versus knowledge that is gained after being exposed to novel tactics. A student population was chosen for this study because we assumed that it would largely consist of naïve negotiators. However, previously held knowledge about negotiation tactics (in the form of past experience or expertise) was not measured before the experimental manipulation in this study because of the concern that it might cue the use of the tactics identified. Thus, we do not know for certain whether the tactics manipulation provided

novel information or merely cued the use of previously known tactics. This distinction is important to study because the negotiators' ability to effectively apply the knowledge might differ depending on the novelty of the tactics. Although our results do suggest that negotiators are able to apply appropriate tactics when the task demands are not "too high" (as demonstrated in the low-content, tactics-absent condition), it is unclear whether knowledge of those tactics was specifically held and successfully accessed or spontaneously generated during the course of the negotiation. Future research could use more experienced negotiators to determine the distinct effects of knowledge access versus new knowledge generation on negotiator behavior and outcomes.

In summary, we have demonstrated that demands of the negotiation task (as defined by the semantic form and complexities of the task materials) can have dramatic effects on both behaviors and outcomes. When a negotiation task affords relatively high task demands on negotiators, and suggests inappropriate default behaviors and assumptions, negotiators have a difficult time releasing a key distributive behavior (substantiation) and engaging key integrative behaviors. Though the presentation of a list of tactics facilitates the latter difficulty, it has no effect on the former. When negotiation task demands are minimal and substantiation is inhibited, negotiators have no difficulty in achieving Pareto optimal solutions, whether they have been presented with relevant tactics to assist them or not. As a consequence, theories and observations of negotiation problem solving should take into account the effects of task demands, knowledge, and the fundamental limits of human cognition. Hopefully, this study can help to advance the ecological (and epistemological) validity and utility of negotiation research (Hoffman & Deffenbacher, 1993). Not only are these interesting problems in themselves, but in the words of a popular text on negotiation, "Like it or not, negotiation is a fact of life" (Fisher, Ury, & Patton, 1991).

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NOTES

1. This contrasts with zero-sum tasks in which one party's gain is equal to the other party's loss. As discussed later, negotiators typically assume a negotiation task is zero-sum (Pinkley, Griffith, & Northcraft, 1995; Thompson & Hastie, 1990).
2. This is consistent with evidence that human problem solving is not strictly linear in goal selection (i.e., last-in, first-out), but that the focus of attention can be shifted among goals depending on the context (VanLehn, Ball, & Kowalski, 1989). In fact, skilled performance in some related areas, such as creative writing, depends on the coordinated examination of upper-level goals and constraints and local contexts for decision making (Flowers & Hayes, 1981).
3. This hypothesis does not constitute a true manipulation check, because it is not focused on determining whether the manipulation itself was perceived. Instead, it posits whether the manipulation had a specific effect on one of the dependent variables of interest.
4. Preliminary studies suggested that the allotted time for the high-content group should be 1 hr, and the allotted time for the low-content group should be one-half hour.
5. Equivocal tactics are those that can serve either integrative or distributive functions depending on their application.

6. The speaking turn, rather than the thought unit, was chosen as the unit of analysis to allow restatements of the same thought by the same speaker to be counted only once, rather than twice. See Weingart (1997) for a discussion of coding group interaction.
7. Dyads presented with a warning that their time was running out were excluded from this analysis. This resulted in the exclusion of four dyads from the high-content group and two dyads from the low-content group.
8. The results of a multiple regression analysis, in which Pareto efficiency was regressed on the relative frequency of all integrative and distributive negotiation behaviors, was highly significant ($R^2 = .45$, $p < .001$). Two significant predictors were revealed: multioffer ($\beta = .61$, $p < .001$) and multipref ($\beta = .57$, $p < .01$). However, 53% of the pairs of tactical behaviors were significantly intercorrelated, thus multicollinearity among the independent variables could have dampened other effects.
9. Multipreference and multiquestion were highly intercorrelated ($r = .85$, $p < .001$), and thus could not be entered into a regression equation simultaneously. To avoid this problem of multicollinearity, these two categories were combined into one category, labeled "priority exchange."

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Appendix A

Subjects in the tactics-present condition received this list of tactics. However, tactics were presented without the "integrative," "distributive," and "equivocal" headings and were mixed in order across categories.

I. NEGOTIATION TACTICS

Integrative Tactics

Do Not Assume A Zero-Sum Game. Do not automatically assume that a total gain in profit points for you results in a loss of profit points for the other party.

Trade-off Issues. You and your negotiating partner may place a higher, or lower, value, based on profit points, on the same issue. Trade off issues that are lower in value for you for issues that have higher values. For example, suppose you are negotiating on the amount of products X and Y you will receive. If each level of X you receive gives you more profit points than each level of Y, offer to take less of Y, the lower valued item, if you can get more of X, the higher valued item.

Distributive Tactics

Appear Firm. Do not appear as if you will back down on your negotiating position.

Use Persuasive Argumentation. Provide rationale for your position to persuade the other person to change their mind about an issue. For example, if it is important to you to have a low temperature for your food products, you can argue that if the temperature goes above a certain level the customers will not want to buy your coffee because people find it uncomfortable to drink hot coffee when they are too warm.

Equivocal Tactics

Exchange Information. Try to get information about the other party's preferences on specific issues. You can do this directly, by asking a question such as, "What issue is the most important for you?" or more indirectly by judging his or her reactions to your offers.

Set Goals. Set a high, explicit goal for the outcome of the negotiation. You should be prepared to change this goal as you gain more information and can determine if your goal is realistic. For example, in the negotiation you have a walk-away value of 99 points. This represents the amount of profit points you will get if you cannot come to an agreement today. You should set a goal that is higher than this amount.