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NEGOTIATOR COGNITIONS:
A DESCRIPTIVE APPROACH TO NEGOTIATORS' UNDERSTANDING OF THEIR OPPONENTS

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July 1986 W.P. 1809-86

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Negotiators' Understanding of Their Opponents

Abstract

Substantial evidence exists that negotiators frequently fail to attain readily available and mutually beneficial outcomes. This paper provides a preliminary model of why these failures exist. We assume that negotiators are decision makers, and that their errors derive from cognitive processes ignored by utility-maximization theories. We focus on one part of the model: the systematic tendency to ignore the cognitions of opponent negotiators.

Empirical evidence clarifying negotiators' cognitive processes is generated using verbal protocol techniques in a controlled negotiation task. The results show that subjects simplify the negotiation task, in part by ignoring contingencies introduced by the knowledge possessed by their opponents. The discussion focuses on how subjects simplify the task and how the decision making perspective helps redirect the negotiation literature.
Two or more interdependent parties are negotiating if they are making joint decisions and do not have identical preferences across decision alternatives (Pruitt, 1981, 1983; Kelley & Thibaut, 1980). Despite the obvious prevalence and importance of negotiation, substantial evidence exists that negotiators frequently fail to attain readily available and mutually beneficial outcomes, and that these inefficiencies in the negotiation process reduce society's available resources, productivity, and creative opportunities, and increase society's conflict and self-destructiveness (Pruitt and Rubin, 1986; Raiffa, 1982).

This paper provides a preliminary model of why these failures exist, based on the cognitive processes of negotiators. We focus on one part of the model: the systematic tendency to ignore the cognitions of opponent negotiators. Empirical evidence clarifying negotiator's cognitive processes is generated from verbal protocol methods used in the study of decision making.

**Negotiator Rationality**

Negotiation research has assumed the rationality of both outcomes and process. By rationality of outcomes we mean that an agreement will be reached if and only if there is a zone of agreement that both parties prefer over reaching impasse, and the agreement will be such that there is no alternative joint resolution available that would be preferable to both parties (Zuethen, 1930; Nash, 1950; Cross, 1969; Farber, 1980, 1981). In contrast, ample empirical evidence has shown that individuals often fail to reach an agreement despite a positive zone of agreement, and often reach inefficient outcomes (cf. Pruitt and Rubin, 1986).

By rationality of process we mean that negotiation researchers have
assumed that negotiators are utility maximizers. Negotiators are thus assumed to follow systematic search and evaluation processes, to fully consider all alternatives, and to select the best for implementation. However, there are theoretical and empirical reasons to believe that actual negotiator behavior does not exhibit the rationality of economic models. In general, behavioral decision research shows that individuals deviate from rationality in systematic and predictable ways (Kahneman et al., 1982; Hogarth, 1980; Nisbett & Ross, 1980). More specifically, recent research demonstrates that negotiators deviate from the economic model of negotiator rationality in a number of systematic ways (Neale and Bazerman, 1985; Bazerman & Carroll, 1987). For example, negotiators may fail because: (1) they are overconfident that their side is correct and would be chosen by an arbitrator (Neale and Bazerman, 1983), (2) they feel committed to a previous course of action and escalate their commitment in order to justify their current stance in the conflict (Brockner & Rubin, 1985; Staw, 1976, 1981), (3) the costs of settling are more salient than the costs of holding out (Neale, 1984), and/or (4) the negotiation is "framed" as losses rather than as gains (Bazerman, Magliczzi, & Neale, 1985).

We argue along with Pruitt (1981) that negotiation is a decision making process in which two or more parties make decisions to resolve conflicting interests. We propose that the decisions of negotiators are affected by a host of situational and individual variables. Negotiation outcomes are then the product of these decisions and the structure of the contingencies among negotiators. This view of negotiator behavior separates the decisions of negotiators from the outcomes that they
receive, thereby addressing criticisms of negotiation research for focusing on outcomes rather than an underlying "process" (Kochan, 1980).

We believe that it is necessary to develop a better descriptive understanding of the decision processes of negotiators, rather than simply prescribing how rational actors would make decisions. The negotiator errors and biases mentioned above demonstrate the fruitfulness of considering negotiation as another area of individual judgment and decision making, extending the domains studied in Behavioral Decision Theory (Kahneman et al., 1982; Nisbett & Ross, 1980; Pitz & Sachs, 1984). However, a theory of negotiator cognition must go further than demonstrating well-known judgmental errors in new contexts. In the remainder of this paper, we suggest one form that such a theory might take, provide a method for more directly observing negotiator cognitions, and present a study exploring negotiator cognitions in a well-known context.

A Preliminary Theoretical Framework

At the most general level, we are stating that negotiator behavior can be viewed as the product of judgments made by negotiators who are limited information processors. Their judgments, what we are calling negotiator cognitions, are based on information provided in the task and information available from past experience, as understood and integrated by the negotiator. In this process of selecting, interpreting, and combining information, many simplifications and errors are introduced by the negotiator in the attempt to cope with a complex and uncertain situation.

For example, there is evidence that negotiators seem to respond to negotiating tasks by first making simplifying assumptions and then
learning incrementally to relax the assumptions one-by-one. Bazerman et al. (1985) found that individuals faced with a novel integrative bargaining task initially assume that the "pie" is fixed, resulting in a win-lose orientation and a distributive approach to bargaining. While this simplifying assumption may be cognitively necessary, it also limits the process and outcomes that the negotiators receive.

As negotiators become more experienced and sophisticated, they shift their attention to different aspects of the game, one at a time, and learn to relax their simplifying assumptions. Bazerman et al. found that negotiators learn over time to look beyond the "fixed pie" in order to reach integrative solutions. In tasks where there is a power imbalance between negotiators (McAlister, Bazerman, & Fader, 1986), the more powerful negotiators finally learn to use their greater power to distribute more to themselves.

In order to provide a framework for understanding negotiator cognitions, and to incorporate the biases and errors evidenced in controlled laboratory tasks, we suggest that negotiators are called upon to exhibit a set of components or cognitive competencies (Mischel, 1973) necessary for a full understanding of a negotiation task. Such a set of components might include the following:

I. Understanding your "role" in the negotiation
   A. Your goals
   B. The task parameters
   C. The domain of alternatives
   D. The functional relationships in the task

II. Understanding your opponent
A. The opponent's goals
B. The domain of the opponent's alternatives
C. Predicting the opponent's behavior
D. Understanding the source of the opponent's behavior

III. Projecting events
A. Combining multiple functional relationships
B. Projecting contingencies between own and opponent
C. Projecting multiple time points or opponents

IV. Implementing your understanding
A. Social skills such as sensitivity and assertiveness
B. Negotiation tactics

These components are not primitive units, but quite complex skills. Each is based on other skills involving paying attention, reading, recalling a experience base, using various types of logic (thinking), imagining, and so forth. We have attempted to list components at a functional level that is workable for research on negotiation.

In terms of the above framework or component list, negotiators in the Bazerman et al. and McAlister et al. studies are developing these components through their experience with negotiations. They first understand negotiations in a simple way with limited goals, alternatives, and contingencies. They gradually learn to consider more goals at a time, more actors at a time, and to imagine more alternatives.

The above framework suggests that negotiators face more possible errors and biases than those we have already discussed. In particular, we believe that negotiators make many of their most serious errors when they
improperly model the behavior of other actors by ignoring their actions or assuming the others will continue behaving the same way despite changes in the negotiator's own behavior. In order to develop our approach to negotiator cognition, we will use this issue as the focal point of empirical research.

**Ignoring the Active Decision Processes of Competitive Others**

Many researchers have argued that negotiators must cognitively determine the planned strategy of the other party (Walton and McKersie, 1965; Rubin, 1980). Siegal and Fouraker (1960) state that successful negotiation depends on considering how the opponent will assess possible outcomes. Kelley and Thibaut (1980) argue that relationships achieve mutually satisfactory sets of outcomes by recognizing the mutual benefits of certain joint activities or joint sets of activities (trading). Despite the clear importance of analyzing the cognitive strategy of an opponent negotiator, virtually no research has examined the ability of negotiators to follow the prescription stated above. While the importance of understanding the cognitions of the opponent negotiator is well specified by negotiation theorists, we argue that a fundamental (and correctable) impediment in negotiation processes is the failure of negotiators to cognitively consider the intended decisions of the opponent negotiator. Empirical research is consistent with this idea, although it has not directly assessed cognitions.

Samuelson and Bazerman (1985) found that negotiators under an information disadvantage deviate from normative behavior by ignoring the information available to the opponent and, consequently, fall prey to the "winner's curse" -- they consistently (and voluntarily) enter into
loss-making purchases. In one of their studies, subjects are given an opportunity to make one bid (take it or leave it) for the acquisition of a company (the full problem is provided in Appendix 1). As potential acquirers, subjects know only that the company is equally likely to be worth any value between $0 and $100 and that, whatever its value, it is worth 50% more to the acquirer than to the target owner. The target owner knows the exact value and will accept any bid at or above that value. What should the acquirer bid?

The most common response was in the $50-$75 range. Samuelson and Bazerman suggest (but do not provide direct evidence) that subjects arrive at this response by the following logic:

The value of the firm is uncertain, but its expected value to me is $75/share. In addition, the expected value of the firm to the target is $50/share. Thus, I can make a reasonable expected profit by offering some price slightly in excess of $50/share.

This logic would be rational if the target was also uninformed about the value of the firm and only had the distributional information available to the acquirer. However, an informed target will only accept offers if they are profitable, which leads to an expected loss (the "winner's curse") for any offer above $0. This is illustrated by the following normative logic for the acquirer considering an offer of $60/share:

Suppose that I make an offer of $60/share. If it is accepted, the firm must be worth between 0 and $60/share. Since all values are equally likely, the average value of the firm to the target when my
offer is accepted is $30/share. Since the firm is worth 50% more to me than to the target, the expected value of the firm to me is then $45/share. My profit has the expected value of $45-$60, or -$15/share. It is not hard to generalize the reasoning for this problem into the conclusion that, when an offer is accepted, the acquirer can expect to obtain a company worth 25% less than the price it pays. Thus, the acquirer's best offer is $0/share, or no offer. This problem is paradoxical in that while the company is worth more to the acquirer in all cases, it is never rational for the acquirer to make an offer.

Samuelson and Bazerman's data show similar results even when subjects were paid for good performance and when a subject population with unusually high analytical capability (M.I.T. Sloan School of Management Master's Students) was used. They conclude that individuals cope with the complex cognitive task involved in competitive decisions by making simplifying assumptions about the behavior of the other party, resulting in the exclusion of the contingency that the opponent has access to key information and thus selectively accepts offers.

At one level, these findings can be taken as evidence of a systematic bias unique to competitive situations under asymmetric information. We propose a stronger argument, however, that individuals in competitive situations make simplifying assumptions that deviate from normative logic about the decision patterns of opponents in order to make the task cognitively more manageable. This systematic pattern is indirectly reflected in several other studies.

Neale and Bazerman (1983) have shown that negotiators typically ignore the information available from considering the perspective of the opponent.
in negotiation, and that this lack of perspective taking ability hinders their success. A simple questionnaire measure of the general tendency to consider the opponent's viewpoint and values (Davis' perspective taking scale, 1981) was highly predictive of concession rate and negotiator success in an integrative, five-issue labor-management simulated negotiation.

Perrow's (1984) analysis of marine accidents also reflects our description of the decision processes of competitors. For example, Perrow discusses one type of ship accident in which two ships are heading directly at each other and will collide unless something is done. Each captain appears to make the simplifying and false assumption that the other ship will continue its current direction and head straight. However, when both parties think in the same active, but naive mode, and if both turn in the same direction -- crunch!

Finally, consider the dollar auction (Shubik, 1971; Teger, 1980), a game in which a dollar is auctioned to the highest bidder, who pays the bid and receives the dollar, but the second highest bidder also pays his or her bid and receives nothing. The common result is an escalating pattern in which individuals bid far in excess of a dollar, which has been explained by arguing that individuals feel entrapped and continue bidding in order to justify their earlier bids -- and to save the loss from quitting and coming in second (Rubin, 1980). We argue that it is at least as important to explain why individuals voluntarily enter into an auction that favors the auctioneer at the expense of the bidders. Our explanation is that individuals see the potential for profit early in the auction, and fail to consider what the auction will look like to other bidders. If the
bidder considered that the auction will look desirable to many bidders, it is easy to see the benefits of staying out of the auction.

The evidence presented above in support of the argument that individuals ignore the cognitions of competitive others has relied on a comparison between negotiator outcomes in carefully-designed problems and potential outcomes achievable with the adoption of an optimal (rational economic) strategy. The failure of subjects to achieve optimal performance was labelled "inefficient" or biased and attributed to the use of a suboptimal strategy. Thus, the existence of inferior strategies has always been inferred rather than observed. Although the pattern of performance across problems can suggest which suboptimal strategies are being used, no more direct measure of negotiator cognitions has been made.

The purpose of the following study is to provide this more direct measurement through the use of verbal protocols in a negotiation task similar to that used by Samuelson and Bazerman. Verbal protocols are collected by instructing subjects to "think aloud" during their deliberations, to report any thoughts that come to mind without self-censorship. Unlike introspections, subjects are not asked to speculate on what they are doing but are asked to verbalize as much of the content of their thoughts as possible. These are used as a partial record of thought processes.

Although verbal protocols have been criticized as inaccurate and disruptive of ongoing processes (Nisbett & Wilson, 1977), the consensus among psychologists has been strongly supportive (Ericcson & Simon, 1980; Smith & Miller, 1978). Verbal protocols are particularly useful when coupled with other types of measures and a strong design (Einhorn,
Kleinmuntz & Kleinmuntz, 1980; Payne, Braunstein, & Carroll, 1978). Verbal protocols have proven useful in both laboratory settings (e.g., Ericsson & Simon, 1980; Payne et al., 1978) and in such real world settings as stock portfolio selection (Clarkson, 1962), consumer purchasing (Payne & Ragsdale, 1978), and medical diagnosis (Johnson, Hassebrock, Duran, & Moller, 1982).

METHOD

75 undergraduates were individually solicited as volunteer subjects from dormitory or lounge areas by one of three interviewers. Subjects were told that the study was part of a research project, would take 15 to 30 minutes, and that they would be tape recorded. In order to use a context more suitable to the undergraduate population and to extend the generality of the original study, we used a problem isomorph in which subjects decide what to offer (as a potential buyer) for a used car that has a value known only to the seller of between $0 and $1000 (all values equally likely) and is worth 50% more to the buyer (see Appendix 2 for complete presentation of the "Used Car" problem). If accepted, the price would be used to calculate the buyer's profit (loss). If not accepted, no transaction would take place. Notice that this problem has all of the same properties as the "Acquiring a Company" problem.

Each subject was given the "Acquiring a Used Car" problem and asked to read it. Verbal protocols were collected by instructing subjects to:

Speak all of your thoughts out loud and we will tape record them.
Everything that goes through your head is equally important, even if you said it once before. Say everything, even if you are just rereading a sentence.
The tape recorder was turned on and subjects were told to determine an answer. If a subject had difficulty verbalizing or forgot to speak aloud, the experimenter gave a neutral prompt such as "tell me what you are thinking."

To focus directly on the proposed difficulty that subjects have in considering the cognitions of the opponent, subjects were then given a "hint" after they had finished the problem, and had a second chance to give an answer. The hint guides them to consider that the seller has special knowledge and that acceptance of the offer implies the car's value:

Now we ask you to reconsider the same problem with the following hint. Regardless of whether your original answer is right or wrong, you should still reconsider the question. Remember that it is not necessary to change your answer. Reexamine your final offer in view of the fact that the dealer knows the actual value of the car before he decides whether or not to accept your offer. Perhaps consider the likely value of the car given that he accepts the tentative offer which you are considering.

Finally, subjects were debriefed and given the correct answer and the reasoning behind it if they wished to know.

RESULTS

Offers

We found it useful to classify the 75 subjects based on their offers into four categories: $0, the right answer (8 responses); $500-750, the answer produced by the naive logic that the car is worth about $500 on
average (39 responses); $1-499, a conservative but incorrect offer (12 responses); and offers over $750, a liberal and incorrect offer (16 responses). This distribution is very similar to the distribution obtained by Samuelson and Bazerman in the "Acquiring a Company" problem.

The distribution obtained confirms a number of observations. First, normative logic continues to be counterintuitive (i.e., rare) in the context of a new problem. Second, the naive reasoning again appears to be the most common. And third, a significant number of subjects respond with offers that neither follow the naive nor normative reasoning. This pattern is consistent with the results of Samuelson and Bazerman, although they ignored the fact that a significant minority of subjects did not follow naive or normative logic.

Following the hint, only 21 subjects (28%) changed their offers. Only two of these changed to the correct offer of $0, raising the percentage of correct answers from 11% to 13%. Most subjects lowered their offers $100 to $200, and one subject raised his offer. The verbal protocols following the hint suggest that those subjects who lowered their offers either took the hint as a cautionary point, or reasoned that acceptance of the offer implied overpayment. We will therefore focus our analysis on the original responses and treat the hint as an ineffective improvement strategy.

**Verbal Protocols**

The verbal protocols were coded by breaking them up into phrases each representing a single thought or idea, and then categorizing the types of statements that occurred. The categories were developed from both theoretical concepts of good and bad reasoning on this task and the experience of the three interviewers during the data collection. The
three coders (the interviewers) first listened to ten protocols together and compared results until consensus was reached. Then, each protocol was assigned to two coders. Each protocol received a code for each category: a "0" if the category was never mentioned, a "1" if both coders said the category was mentioned anywhere in the protocol, and a "0.5" if one coder said the category was mentioned and the other disagreed. Interrater reliability for the three pairs of coders was 76%, 82%, and 86%.

Table 1 shows the percentage of subjects in each offer group who exhibited each of the 16 categories of protocol statement. 5 of these categories represented thoughts that were characteristic of our expected naive decision processes (e.g., the subject assumes a fixed value for the car), 6 categories represented thoughts that were characteristic of our expected normative decision processes (e.g., the subject explained the contingent behavior of the seller in a generalized manner), and 5 categories represented thoughts that were neutral in reference to the naive vs. normative distinction (e.g., the subject repeated that the car was worth 1.5 times as much to the buyer as to the seller).

Insert Table 1

Subjects who made incorrect offers differed dramatically from those who made the correct offer of $0. Table 1 shows that several protocol codes strongly differentiated between the $0 offer category and the other three categories. For example, 87.5% (7 out of 8) of the subjects who offered $0 developed a generalized argument that articulated the likely contingent behavior of the seller. Only 7 of the remaining 67 subjects
(10.4%) exhibited this protocol. An example of a generalized hypothetical is illustrated in the following quote from one of the 8 subjects who offered $0:

3/2 the actual value minus my offer is my gain, now I want to maximize that. Somehow I need to relate my offer to the actual value of the car, I don't know the value, so I have to come up with an offer.
Let's say I offer 500, then my gain is 250 if the car is 500 at maximum. If it is worth 0, at worst, my gain is -500. So my expected benefit is linear between those two, halfway between -500 and 250...This looks like I lose all the time. If I offer 1000, I can make 500 or lose 1000, in which case I lose bigger. The more I offer, the more I lose. So from that I think I will offer him $0 for his car.

Similar differences occurred in the protocol category for assuming a fixed value for the car. None of the correct subjects exhibited this thought pattern. However, significant numbers of subjects exhibited this protocol in each of the other three categories. For example, a subject in the naive value category provided the following quote:

I'd say its equally possible that its worth between 0 and 1000, so in the average case, it's worth 500 to the dealer which means on the average is worth 750 to me. So I have to offer him, on the average, at least 500 for him to sell it and on the average, any offer under 750 is worthwhile to me. And, I'd say its worth 50% more to me...out of that 250, I'd go 150/100 split so I'd say 650.

Notice that the naive reasoning is consistent with using the midrange value for determining the best guess for the value of the car.
We also observed that assuming a fixed value for the car explained many of the subjects who offered between $1-499 or $751-1000. The following subject explains how this protocol code affected the resulting non-optimal offer:

The car is very old, so I don't think it would be worth more than 2 or 300 so I would probably offer him $150...it says here I could use the car, so I'd offer him 200.

While this subject is not following the valuation basis provided in the instructions, his assumption of a value was moderately common on both the high and low ends.

Because most of the categories in Table 1 exhibit large differences, we used stepwise multiple discriminant analysis to identify those categories that were most important in separating correct answers from incorrect answers, and then a second analysis was performed to examine differences among the three ranges of incorrect answers.

Three of the protocol codes were significantly associated with correct answers: (1) the generalized hypothetical reasoning \[ F(1,71)=13.8, p<.001 \], (2) recognizing that it is not necessary to buy the car \[ F(1,71)=9.2, p<.01 \], and (3) not having a false objective \[ F(1,71)=6.0, p<.05 \]. The first suggests that proper analytical reasoning does indeed lead to the correct offer. The second and third codes suggest mistakes in framing the problem that lead subjects to make a non-zero offer. The canonical discriminant function based on these three codes was highly significant \[ F(3,71)=23.8, p<.001 \] and able to classify 99% (74 of 75) of the subjects into correct vs. incorrect answers.

A second analysis showed that the three incorrect answer groups could
be predicted at a statistically significant level by only one of the protocol codes: Guessing a median range value $[F(2, 64) = 4.3, p < .05]$. Those who guess a median range value tend to give offers between $500 and $750. However, considered in a very exploratory way, a model with three protocol codes was significant $[F(6, 124) = 3.2, p < .01]$ and made good sense. This model included Guessing a median range value $[F(2, 124) = 3.1, p < .05]$ and two marginally-significant variables: Assuming a value for the car $[F(2, 124) = 2.5, p < .10]$, and Offering the buyer's value $[F(2, 124) = 2.5, p < .10]$.

Two discriminant functions emerge, the first separating the middle-range offers from the low and high offers $[\chi^2(6) = 17.9, p < .01]$, and the second separating high offers from low $[\chi^2(2) = 5.0, p < .10]$. The middle range offers are most closely associated with guessing the median range whereas low and high offers are associated with assuming a value for the car. The high offers are associated with offering the buyer's value instead of one closer to the seller's value, and low offers are associated with realizing that the buyer can lose money. This model correctly predicts which of the three incorrect answers was given by 63% of the subjects.

**DISCUSSION**

**Negotiator Cognitions**

This paper began by offering a preliminary model of the cognitive activities that negotiation tasks require. This model offers the potential to diagnose deficiencies in the process of negotiator cognition. We focused on one component of the model: the limitations in our ability to understand the information available from considering the
cognitions of an opponent. The results of the empirical study show that negotiator cognitions can be more directly observed, and these intervening processes are consistent with those hypothesized by Samuelson and Bazerman. Individuals were found to make obvious mistakes due to their inability to conceptualize the cognitive processes of their opponent. However, this paper found a more complicated story than the one proposed by Samuelson and Bazerman.

First, Samuelson and Bazerman considered subjects in two categories: those who followed normative logic (the minority) and those that followed naive logic by making offers that assumed a mid-range value for the commodity (the majority). They failed to evaluate the significant minority of subjects who offered other responses. In contrast, the current study found that these categories of responses also occur because subjects make simplifying assumptions and assume a value for the commodity. However, these subjects assumed idiosyncratic values for the commodity other than the expected value. Most commonly, they brought their prior knowledge about cars into the laboratory. At one level, this is an experimental problem. At another level, this expands on the Samuelson and Bazerman argument. Our results suggest that individuals, faced with competing on a commodity of uncertain value, make the task more concrete and certain by creating an assumed value. However, the expected value of the commodity is only one of many values that they may use to simplify their decision process. A variety of other heuristics (e.g., assessing the value based on a similar commodity that they recently purchased) may lead them to assume a very different value as well.

This section has argued that individuals commonly ignore the
cognitions of a competitive other, and provided a cognitive explanation for this tendency. Although we have illustrated this tendency in a fairly simplistic environment, we would expect this tendency to generalize to complex negotiations. In our tasks, the subjects had the potential to cognitively deal with the information requirements. In fact, when presented with the normative logic after completing the task, subjects often were disgusted by their offers — "it was so obvious." In complex negotiations, the cognitive demands are far more severe, leading to greater use of cognitive simplifications, and the greater likelihood of assuming some knowledge such as the value of the commodity for sale. Future research must demonstrate the tendency to ignore the cognitions of competitive others in more complex and realistic settings.

What is Ignored?

We proposed that poor performance on the Used Car and Acquiring a Company problems was due to a tendency to ignore or simplify the cognitions of opponents. However, in neither of these problems is there an "opponent" in the usual sense of the term. There is no opportunity to get information about the opponent, to exercise influence, to gain feedback, to have a multi-move interaction, or any of the usual aspects of negotiation against an opponent. Instead, all the contingencies are presented as the certain consequences of a single act, the bid. An alternative, and more general, explanation of the previous results is that individuals have a tendency to make simplifying and potentially biased assumptions when faced with a task that requires incorporating knowledge about future contingent events. That is, when individuals are faced with contingencies, they make simplifying assumptions to make decision making.
under uncertainty more manageable. If there is simply a difficulty in understanding an opponent, rather than a more generalized difficulty in understanding contingencies, then we would predict that performance should improve in a task containing the same contingencies but no opponent.

We ran an initial pilot study to test out this idea using two isomorphic problems: Acquiring a Company, which has an "opponent", and a new problem called Beastie Run in which the contingencies were created by nature rather than a willful and thinking opponent. This problem asked subjects to lay a trap for valuable Beasties that come in sizes from 0 to 100 lbs. They must choose to set one net of size ranging from 0 to 100 lbs. capacity. Beasties larger than the net will escape without cost; those that are caught can be sold at $15 per pound but the net they are in will be destroyed and costs $10 per pound of capacity (see Appendix 3).

Additionally, we tried to clarify the "hint" in such a way as to encourage proper reasoning without giving away the answer. We chose to do this by asking a series of eight questions that guided each subject in Socratic fashion through the conditional reasoning process. For example, the questions in Beastie Run started simply with "Can you catch a 60 lb. beastie with a 40 lb. net?" The questions increased gradually in difficulty and insight until they asked about the expected weight of beasties caught with a 60 lb. net and the gain/loss from catching a 30 lb. beastie in a 60 lb. net.

The results are simple to state: equivalent low rates of correct answers on both problems, and very little change as a result of the Socratic reconsideration. Although this is not a definitive answer to whether subjects ignore the cognitions of opponents or more generally
ignore contingencies, it is consistent with the view that people make
simplifying assumptions about contingent behaviors, and that our tendency
to ignore the cognitions of others is just one manifestation of this more
general decision bias. More research is needed to better understand how
individuals cope with complex decision problems in which important
contingent events remain unknown. We must also identify what is unique
about competitive situations, and clarify the new cognitive problems that
are posed to the negotiator. We see this as an important direction for
negotiation research.

Improving Negotiators' Decisions

Finally, in developing our understanding of negotiator cognition, this
paper helps redirect the negotiation literature. Past research in the
area of negotiation has focused on three major topics: (1) economic
models of how people would make decisions in negotiation tasks if they
were fully rational (Nash, 1950; Raiffa, 1982); (2) structural
(situational) determinants of negotiated outcomes such as differential
information or payoffs (Kochan, 1980) or the effects of other surrounding
characteristics (e.g., the form of third party intervention that will be
used if the negotiators reach impasse); and (3) individual differences
among negotiators, such as competitiveness (Rubin and Brown, 1975). We
believe that a new important approach to improving negotiation
effectiveness can be found in improving the decision making process of
negotiators (Bazerman and Carroll, 1987). This paper identifies behaviors
that impede our decision making process in negotiation. Future research
must identify how such biases can be eliminated from the negotiator's
cognitive repertoire.
References


Table 1
Percentage of Subjects in Each Offer Group who Exhibited Each Protocol Category

<table>
<thead>
<tr>
<th>Protocol Category</th>
<th>A: $0</th>
<th>B: $1-499</th>
<th>C: $500-750</th>
<th>D: $751-1500</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAIVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assume value of car</td>
<td>0</td>
<td>46</td>
<td>24</td>
<td>53</td>
</tr>
<tr>
<td>Irrelevant information</td>
<td>12</td>
<td>58</td>
<td>37</td>
<td>62</td>
</tr>
<tr>
<td>False objective</td>
<td>6</td>
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<td>Bad hypothetical</td>
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<td>Offer buyer's value</td>
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<tr>
<td>Dealer knows more</td>
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<td>4</td>
<td>8</td>
<td>6</td>
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<tr>
<td>Don't have to buy</td>
<td>94</td>
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<td>Dealer can refuse</td>
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<td>Can lose money</td>
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<tr>
<td>Generalized hypothetical</td>
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<td>50% more to me</td>
<td>75</td>
<td>42</td>
<td>50</td>
<td>41</td>
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<tr>
<td>Maximize value to me</td>
<td>88</td>
<td>25</td>
<td>22</td>
<td>12</td>
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<td>Possible mutual benefit</td>
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<td>6</td>
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<tr>
<td>Ambiguous hypothetical</td>
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<td>Median range value</td>
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<tr>
<td>N</td>
<td>8</td>
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<td>39</td>
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Note: Disagreement among the 2 coders yielded a code of .5.
Appendix 1: Acquiring A Company

In the following exercise you will represent Company A (the acquiror), which is currently considering acquiring Company T (the target) by means of a tender offer. You plan to tender in cash for 100% of Company T's shares but are unsure how high a price to offer. The main complication is this: the value of Company T depends directly on the outcome of a major oil exploration project it is currently undertaking. Indeed, the very viability of Company T depends on the exploration outcome. If the project fails, the company under current management will be worth nothing -- $0/share. But if the project succeeds, the value of the company under current management could be as high as $100/share. All share values between $0 and $100 are considered equally likely. By all estimates, the company will be worth considerably more in the hands of Company A than under current management. In fact, whatever the ultimate value under current management, the company will be worth fifty percent more under the management of A than under Company T. If the project fails, the company is worth $0/share under either management. If the exploration project generates a $50/share value under current management, the value under Company A is $75/share. Similarly, a $100/share value under Company T implies a $150/share value under Company A, and so on.

The board of directors of Company A has asked you to determine the price they should offer for Company T's shares. This offer must be made now, before the outcome of the drilling project is know. From all indications, Company T would be happy to be acquired by Company A, provided it is at a profitable price. Moreover, Company T wishes to avoid, at all cost, the potential of a takeover bid by any other firm.
You expect Company T to delay a decision on your bid until the results of the project are in, then accept or reject your offer before the news of the drilling results reaches the press.

Thus, you (Company A) will not know the results of the exploration project when submitting your price offer, but Company T will know the results when deciding whether or not to accept your offer. In addition, Company T is expected to accept any offer by Company A that is greater than the (per share) value of the company under current management.

As the representative of Company A, you are deliberating over price offers in the range $0/share (this is tantamount to making no offer at all) to $150/share. What price offer per share would you tender for Company T's stock?
Appendix 2: Acquiring A Used Car

In the following exercise, you are asked to make an offer on a '72 Pontiac from a dealer at John's used car lot. The dealer will accept or reject your offer and that will end negotiations. Your objective is to make the offer that will maximize your own expected benefit whether or not you buy the car.

The value of the car is directly proportional to the mileage on it. Because the dealer could have rolled back the odometer, you have no way of knowing the true mileage. However, the dealer does know it.

In the worst case, the car is worthless to the dealer. In the best case it is worth $1,000 to him. Given the range of possible mileages, all values between $0 and $1,000 are equally likely.

Since you can make good use of the car, it is worth more to you than to the dealer. In fact, it is worth 50% more to you. At worst the car is worth $0 to both you and the dealer. If it is worth $500 to him it is worth $750 to you. Similarly, it if is worth $1,000 to him it is worth $1,500 to you.

You have to determine a price to offer for the car without knowing its true value. The dealer can accept your offer and you will get the car at the price offered, or he can reject it. If he rejects your offer, no further negotiation will take place and you will not buy the car. You should assume that the dealer will only accept profitable offers.

Thus, you do not know the value of the car when making your offer, whereas the dealer does when deciding whether to accept or reject your offer. In addition, the dealer will accept any offer that is greater or equal to the value of the car to him.

You are deliberating between price offers in the range of $0 (this is the same as making no offer) to $1,500. What price offer do you make?
Appendix 3: Beastie Run

Imagine yourself in an imaginary land whose people are very interested in obtaining scarce creatures called beasties.

Beasties travel along a route called Beastie Run. Because of the scarcity of beasties and the many people who want to trap one, trappers are allowed to set one net only and to attempt to capture the next beastie that comes along. Thus, each trapper has one and only one chance at a single beastie.

Beasties come in all sizes from 0 to 100 lbs. Beasties are equally likely to have any weight between 0 and 100 lbs. In order to catch a beastie, you must have a net able to hold at least that much beastie. Nets come in all sizes from 0 to 100 lbs. capacity. If you lay a net too small for the beastie it will jump over the net and you will not have another chance. If you lay a large enough net, the beastie will be caught but in its struggle, it will ruin the net (regardless of net size).

If you catch a beastie, it can be sold for $15 per pound. However, you must pay $10 per pound of net size should you ruin the net by catching a beastie. If you select a net smaller than the next beastie, the beastie will escape but the net will be intact and you return it at no cost.

Your objective is to maximize your expected benefit, regardless of whether you choose to buy a net at all.

Your task is to determine what size net to lay. You are deliberating over net sizes in the range from 0 lbs. (equivalent to buying no net at all since it catches only worthless beasties but costs nothing) to 100 lbs.

Remember that you do not know the size of the beastie that will come down Beastie Run when you make your decision about the net.