IMPROVING NEGOTIATORS' COGNITIONS

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Abstract

Researchers are beginning to develop a cognitive perspective on negotiations that treats negotiators as problem solvers who are prone to various errors and biases. We explore one important type of negotiator error -- the tendency to ignore the way the opponent thinks about the negotiation problem -- and examine ways to overcome this error and thus improve negotiator performance. A series of studies investigates incentives and training packages focusing on concrete examples and general principles. The results show dramatic improvements in performance due to clearer instructions, and modest success for the training packages, although many people give the right answer for the wrong reasons. Only those subjects with a combination of at least three economics courses and the training package were able to achieve a high level of performance similar to that of professional bankers.
Economic analyses of negotiation situations assume that sufficiently informed and motivated negotiators will reach optimal solutions to a negotiation problem: a Pareto optimal solution when a "zone of agreement" exists, and no agreement when such a zone does not exist. In contrast, empirical research on negotiations has revealed numerous instances in which negotiators fail to identify readily-apparent solutions, reach agreement when none should exist, or reach suboptimal solutions (e.g., Bazerman, 1990; Pruitt & Rubin, 1986).

In this paper, we adopt a cognitive perspective to explicate one important type of negotiator error: the tendency to ignore the way the opponent thinks about the negotiation problem. In a series of experiments, we couple our understanding of the sources of this error with manipulations intended to improve negotiator performance. We view the development and testing of training procedures as one way to promote both stronger theories of negotiation and improved negotiation practices that can potentially enhance societal well-being.

Negotiator Cognitions

Researchers are beginning to develop a cognitive perspective on negotiations that treats negotiators as problem solvers. Within this perspective, a growing list of errors and biases distinguish human
performance from the economic "ideal," accompanied by a slowly-developing body of theory to explain behavior. It has been shown that negotiators may fail to reach efficient agreements because: (1) they are overconfident that their side is correct and would be chosen by an arbitrator (Neale & 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), (4) the negotiation is "framed" as losses rather than as gains (Bazerman, Magliozi, & Neale, 1985), and (5) they presume a "fixed-pie" or zero-sum situation and therefore fail to detect integrative potential (Thompson & Hastie, 1988).

Bazerman and Carroll (1987) suggest that an understanding of negotiators that would illuminate these anomalous outcomes requires the concept of limited rationality and attention to the cognitive processes of negotiators. Individuals' cognitive processes mediate the effect of context and information on negotiation. In short, negotiators' performances are determined by the way they interpret and analyze negotiation situations, and by the cognitive skills they have for identifying appropriate responses and strategies.

Thus, some of the shortcomings of negotiations (in comparison to the normative economic model) are the outcomes of deficient analyses of the negotiation situation arising from errors and biases on the part of the negotiators. Research shows that greater success in achieving individual and joint profits accrues to negotiators who are better able to understand the opponent's priorities (Carnevale & Isen, 1986), see the negotiation situation from the opponent's perspective and thus have realistic
aspirations (Neale & Bazerman, 1983), and correctly estimate the amount of resources to be divided (Thompson & Hastie, in press).

**The Acquiring a Company Task**

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 voluntarily enter into loss-making purchases. In one study, subjects have 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 per share and that, whatever its value, it is worth 50% more to the acquirer than to the target owner. They also are told that the target owner knows the exact value of the company and will accept any bid at or above that value. What should the acquirer bid?

The majority of subjects bid within a perceived bargaining zone of $50-$75, which presumes that the stock has an expected value to the target of $50/share, and an expected value to the acquirer (themselves) of $75/share. However, an informed target will only accept offers if they are profitable. For example, if the seller accepts an offer of $60/share, then the firm must be worth between $0 and $60/share. On average, the firm would be worth $30/share to the target, and $45/share to the acquirer. Therefore, the acquirer should expect to receive less than the offer of $60/share! For any accepted offer, on average, the acquirer can expect to obtain a company worth 25% less than the price it paid. Thus, the acquirer's best offer is $0/share, or no offer. Yet, fewer than 10% of subjects correctly bid $0.
At one level, these findings can be taken as evidence of a systematic bias unique to competitive situations under asymmetric information: the exclusion of the contingency that the opponent has access to key information and thus selectively accepts offers. Samuelson and Bazerman proposed 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.

Additional research using variations of this prototypical "errors and biases" task has provided further evidence of the robustness of the phenomenon and explication of the underlying errors of reasoning. Carroll, Bazerman, and Maury (1988) used a variation of the problem in which college student subjects had an opportunity to buy a used car that has a value known only to the seller of between $0 and $1000 (buyer only knows that all values are equally likely) and is worth 50% more to the buyer. In order to determine what reasoning processes were being used, each subject was instructed to "think aloud" into a tape recorder as they determined their answer.

Consistent with the results of Samuelson and Bazerman, only 11% of subjects correctly answered $0, and 52% answered between $500 and $750. The analysis of the verbal protocols supported the suggested reasoning processes of these two groups of subjects: correct subjects almost always developed a generalized argument about the likely contingent behavior of the seller, whereas incorrect subjects rarely did this. Correct subjects also recognized that they did not have to buy the car unless it would be a profitable transaction. Incorrect subjects often created a false objective (e.g., "I want to make sure that I get the car") or assumed they
knew the value of the car (e.g., "The car is very old, so I don't think it would be worth more than 200 or 300").

It has been argued that failures such as the above will be eliminated by proper incentives to encourage sufficient analysis (e.g., Smith, 1982) and by learning from feedback (Kagel & Levin, 1986). Although markets can "learn" over time as losers exit from the market, individuals may not easily overcome judgmental distortions (Tversky & Kahneman, 1986). For example, Ball, Bazerman, and Carroll (1990) created a computerized multitrial version of the Acquiring a Company problem in which individual Master's student subjects bid for the company, whose price was then randomly generated, and the result (buy the company with a gain or loss, or not buy the company) was immediately displayed, including changes to their supply of funds (which had real cash equivalents). After 20 trials, only 5 of 69 subjects had learned to bid $0.

The incorrect reasoning demonstrated above is a natural response to a complex situation that leads to incorrect responses. Disregarding the information asymmetry between the two parties is a simplification of the confusing problem that occurs naturally for "cognitive misers" (Abelson & Levi, 1985; Fiske & Taylor, 1984). Nor does performance seem to be correlated with various personality measures (Halpern, 1989). In order to produce better performance, we will have to improve the reasoning underlying basic negotiation skills.

**Teaching Reasoning**

Although human reasoning capabilities are limited (e.g., Simon, 1957), it should be possible to identify specific deficiencies in reasoning and to remedy them through education or information aids. Fischhoff (1982) lists various ways of "debiasing" decision makers, stressing practice with
specific and relevant tasks, task-specific reinforcement, and "explicit admission of the need for learning" (p. 443). He suggests that warnings, descriptions of the deficiencies, personalized feedback, and extensive training can provide correctives to initial inaccuracies in judgment. Specific training seems to work better than general information, although it is not clear whether subjects learn specific responses or more transferrable general skills.

Nisbett and his colleagues have had some success teaching statistical reasoning and other forms of abstract thinking (Lehman, Lempert, & Nisbett, 1988). Nisbett, Fong, Lehman, and Cheng (1987) and Fong, Krantz, and Nisbett (1986) found that some forms of statistics training were effective in teaching logical reasoning, and in the application of statistical thinking to various domains. Cheng, Holyoak, Nisbett, and Oliver (1986) review evidence that people can use statistical reasoning when the problem contains cues that encourage the use of statistical heuristics.

The key problem seems to be transfer, generalizability, or application of principles learned on one problem to other problems. As Raiffa (1984) pointed out, his students used appropriate decision strategies on an exam only when they realized that Raiffa was the author of the test questions, and thus were cued into recalling relevant strategies. In a series of studies, Holyoak and his colleagues (Catrambone & Holyoak, 1988; Gick & Holyoak, 1983; Holyoak & Koh, 1987) showed that the use of analogies depends on cues to retrieve relevant comparison contexts, and cues to permit transfer of the problem-solution schema to the new context. This may require a combination of feature similarities, multiple prior examples, and direct instruction to look for similarities.
Our objective, in the series of studies described in this paper, is to improve performance on the Acquiring a Company problem. Although the choice of any single context raises the question of generalizability, it would seem that success in eliminating bias on this specific problem would be an important first step toward the teaching of reasoning skills necessary for good negotiation. If we are to improve negotiation reasoning skills, then we must understand: (1) the nature of "proper" reasoning, (2) the sources of errors and biases, and (3) the techniques for teaching reasoning.

**Proper reasoning.** Normative theory implies that good performance on the Acquiring a Company task requires that the negotiator recognize the stated goal of profit maximization, perceive the value of the company to both parties, understand the target's contingent rule (sell only if the price is high enough) and the implications for the value of the purchased company, and combine this information in a concrete or abstract version of expected utility. By a concrete version of utility, we refer to specific hypothetical examples such as what would happen if a bid of $60 was accepted, or partial analyses such as the recognition that the probability of losing is double the probability of winning. An abstract version would be formally reasoned in the manner of game theory; such analysis should be sufficient but not necessary for good performance.

**Errors and biases.** Carroll et al. (1988) have shown that errors and biases arise from misstated goals, intrusions of external knowledge into the task that override task information, and failure to recognize the contingent behavior of the opponent. Applying the analyses of sources of error in Fischhoff (1982) and Grether and Plott (1979), these phenomena themselves are due to features of the task (confusing instructions, time...
pressure), features of the *negotiators* (limited information processing, lack of motivation), and combinations of personal and task features (familiarity with the specific materials and the task, Rogoff, Gauvain, & Ellis, 1984).

The studies described in this paper directly or indirectly address these sources of error. In regard to task features, all studies use instructions and task descriptions that avoid sources of confusion. Since subjects may naturally assume they are supposed to bid something, our instructions include language to legitimate a $0 offer and thus avoid subtle demand of an offer above $0. In regard to features of the negotiators, Study 1 uses monetary incentives to affect motivation to do systematic analytical thinking. Prior knowledge is varied in several ways across the studies, including numbers of courses in economics, statistics, decision making, and bargaining/negotiation, and the use of experienced middle managers and bankers in Study 4. Grade point average, standardized test scores, and major are also used to examine general knowledge (or intelligence).

Training techniques. Of central interest are effective techniques for imparting negotiation skills, or the reasoning necessary for skilled negotiation. Nisbett and his colleagues have suggested that statistical reasoning and general logical reasoning can be taught by using a combination of abstract principles and multiple concrete examples, with specific feedback directed at the learner (Nisbett et al., 1987). Holyoak and his colleagues suggest that more shared features across contexts and instructions to induce a more general problem-schema from examples or hints (reminders) about the applicability of prior solutions enhance transfer of knowledge (e.g., Catrambone & Holyoak, 1988).
Studies 2 and 3 use "training packages" consisting of two examples with explanations and general principles derived from our understanding of correct and incorrect reasoning (Carroll et al., 1988). Variations of the training package use examples that share more features with the "target" Acquiring a Company task. A variety of reminders or hints are also included.

Study 1: Monetary Incentives

Economists criticize psychological studies revealing errors and biases by arguing that participants lack motivation to do better (e.g., Grether & Plott, 1979; Smith, 1982). Despite repeated demonstrations that monetary payments fail to improve performance substantially, it seems necessary to investigate whether subjects care enough to do their best. In Study 1, business school Master's students (who presumably care a lot about both money and their egos) are given the Acquiring a Company problem under baseline conditions or monetary incentives for correct performance.

Method

Subjects were 83 first-year Master's students in two Marketing courses, 17 of whom were dropped from further analysis because they reported familiarity with the Acquiring a Company problem. The study was run during class time. Subjects in the Control or baseline condition were given an improved version of the Acquiring a Company problem that involved shortened instructions and wording emphasizing that the subjects did not have to make an offer: "It is not necessary for Company A to make an offer; there are no negative consequences for recommending no offer." Further, the response was made in two-question format: a yes/no recommendation of an offer, and, if yes, a specific dollar per share offer. Appendix 2 gives the complete problem and instructions. Control page 11
subjects merely handed back their forms anonymously.

Subjects in the High Motivation condition were told that we had a way to evaluate performance, and then permitted to choose their preferred incentive for good performance: $10 in cash or a lottery with a 10% chance of winning $100. This choice was intended to enhance the value of the incentive, and to assess risk attitudes. The lottery was determined by their choice of a number from 0 to 9, checked against the first digit of the Massachusetts State Lottery on a specified day one week later. Students in this condition listed their name and address; winners were paid by mail after the Lottery date. In addition to giving their answers, all subjects were asked to give their reasoning, and to provide background information about themselves.

The reasons given for responses were analyzed with a seven-category coding system that was a modified version of the coding system developed by Carroll et al. (1988). The categories were: (1) no explanation - guess, unintelligible; (2) good logic - including numerical analysis or recognition of greater likelihood and magnitude of losses over gains; (3) intuitive logic - recognizing information asymmetry, risk of loss; (4) wrong goal - wanting to buy the company; (5) bad logic - ignoring seller's information, assuming expected value of $50; (6) focus on gain - 50% profit, risk seeking; and (7) focus on loss - risk averse, worst case.

**Results and Discussion**

In the Control condition, only 3 of 28 subjects (11%) got the correct answer, corresponding quite closely to the results of Samuelson and Bazerman, and Carroll et. al. In the High Motivation condition, 9 of 38 (24%) of subjects got the correct answer. The difference between the conditions is not significant \( \chi^2(1)=1.8, p<.2 \), providing only slight [image]
evidence that stronger motivation can improve performance; performance in
the High Motivation condition is still quite disappointing. There was no
apparent difference in the rate of correct answers among those in the
reward condition choosing to work for a sure $10 as opposed to those who
chose the lottery.

Notice that the High Motivation condition had three reasons to do
better than the controls: (1) the chance of earning money, (2) the
association of their name with their answers, engaging more self-esteem
maintenance, and (3) information that the correct answer is not merely a
matter of opinion. It is possible but unproven that still more money
could increase performance somewhat on the Acquiring a Company problem,
presumably by stimulating more effort and avoidance of "clear errors" (Cox
& Isaac, 1986).

An examination of the reasons given for justification of answers
showed that there was little improvement in the quality of reasoning in
the incentive condition. The proportion of reasons showing good logic in
the Control condition was 0%, compared to 5% in the Incentives condition.
The proportion exhibiting intuitive logic (recognizing the possibility of
loss, worst case loss, or information asymmetry) was 7% and 11%,
respectively. Interestingly, the proportion who focused on monetary
risks, seeming to seek the possibility of gain or to avoid losses, was 7%
in the Control condition and 24% in the Incentives condition. Thus, if
anything, the effect of incentives was to generate a concern with money in
terms of risk attitudes rather than normative logic. Note, however, that
the overall relationship of reasons and experimental condition was
nonsignificant [recombining small cells, X2(3)=5.1, p<.2].

Since the improvement in performance was so modest, we chose to
explore training strategies as the aspect of cognition over which researchers have the greatest direct control.

**Study 2: The First Training Package**

The work of Nisbett and Holyoak shows that reasoning can be taught through a combination of didactic principles and examples. The key issue is not to teach specific responses to a particular problem, but to convey the perceptual and reasoning processes necessary to handle new situations. Such transfer of training requires that people recognize the nature of new problems and apply the principles and analogies that have been learned.

Study 2 consists of three separate sub-studies in which somewhat different populations of subjects were given the Acquiring a Company problem with or without a training package. The training package was designed to teach the principles necessary to answer correctly the Acquiring a Company problem: (1) the goal of maximizing expected value, (2) careful attention to all the information given in the problem, and (3) informal analysis of contingencies producing an intuitive version of a decision tree for assessing expected outcomes. This training stressed that contingencies must be viewed from the other party's viewpoint as well as one's own: you must assess what the other party knows and wants in order to predict his or her responses. The principles were explicitly stated and exemplified by two problems: the Used Car problem and the Jade Dragon problem.

In the Used Car problem, adapted from Samuelson and Bazerman (1985), subjects were asked to recommend a course of action for a friend who is considering buying a used car. According to a mechanic, there is a 50% chance that the car has a particular engine problem. That problem would
make the car worth $300 to both the current owner and the buyer. However, if it does not have this problem, it would be worth $600 to the owner but $1300 to your friend (because of a local tax and commuting situation). The current owner knows whether the engine problem is present or not, but the buyer cannot know until the car is bought. The procedure involves only one offer, and the owner will accept the offer if it is higher than the value of the car to him, and reject it otherwise, in which case there is no opportunity to raise the offer. The subjects are asked what they would recommend as a bid for the car.

After subjects make their recommended bid, the training materials explain that the correct answer is to offer $600, since it maximizes their expected benefit: they always get the car, which 50% of the time is worth $300 (lose $300) and 50% of the time is worth $1300 (gain $700). Offers over $600 only result in more profit to the owner and loss to the buyer; offers between $301 and $599 can only buy the $300 car at a loss; offers below $300 never get taken; an offer of $300, although reasonable because it obtains a $300 car 50% of the time, foregoes the opportunity to get a good deal on the car if it does not have the engine problem. It is further emphasized that the goal is to make the best decision in this situation so as to maximize the expected outcomes. Subjects are told that they should not assume that it is possible to guess whether or not the car has the problem; the uncertainty is an integral part of this situation. For simplicity, these explanations ignore risk attitudes; we recognize that extreme risk avoiders would want to offer either $300 or 0, but this seemed an unreasonable complication.

In the Jade Dragon problem, subjects are asked to imagine that they are visiting a foreign country and are offered a jade figurine for sale in
a market place. They know that such art objects vary a lot in quality, and believe it to be worth at least $50, but possibly up to $300. Whatever it is worth to the dealer, it is worth 60% more in the U.S. The dealer has told them to make one offer, take it or leave it. If the offer is more than its value to the dealer, then he will sell; otherwise he will not sell and the offer cannot be raised. Subjects are asked what they would bid if they want to do well and do not want to risk losing money on the deal (notice that this goal is not the same as maximizing expected value). Again, after making their offer, subjects read an analysis arguing that an offer of $80 gives them some potential for profit and ensures that they cannot lose money since the jade must be worth at least $50 to the dealer and, adding 60%, $80 to themselves.

Following the two problems, the principles of goal, information, and analysis from multiple viewpoints are again emphasized. The subjects are then given the Acquiring a Company problem.

Notice that the structures of these problems are similar but not identical. The Used Car problem is discrete (the car has just two possible values) rather than continuous as in the Acquiring a Company problem. The Jade Dragon problem has continuous values, but sets a non-zero lower bound. Further, the goal of the Jade Dragon problem is not to maximize expected utility (a complex calculation depending on unknown risk attitudes) but to seek profit while avoiding loss (which gives a fairly simple answer). All the problems share the asymmetry of information -- the seller knows the value of the object while the buyer does not, the single take-it-or-leave-it bidding procedure, and the generic context of a buyer and seller, but differ in the surface context of what is for sale. The training package is therefore teaching
principles rather than a particular answer (i.e., avoiding all situations where the seller knows more than you is hardly a proper response).

**Study 2a: College Students**

**Method.** 74 undergraduates, mostly engineering majors, took part. 30 were randomly assigned to a Control condition in which they first did the Acquiring a Company problem. Upon completion and collection of answers, they were handed a summary of the general principles (but no examples) and a second copy of the Acquiring a Company problem to complete. The remaining 44 subjects received a training package in which they saw the Acquiring a Company problem, but were asked to delay answering until after they read the remaining materials, which were the Jade Dragon, the Used Car, and the summary of general principles. In all conditions, subjects were asked directly for their bid, with the statement that a $0 bid was equivalent to no bid.

**Results and discussion.** 14 of 30 subjects (47%) in the Control condition gave the correct answer on their first try, compared to 22 of 44 (50%) in the Training condition \( [X^2(1)=0.1, \text{n.s.}] \). On their second try, 20 of 30 Control subjects (67%) gave the correct answer, with 7 of 16 originally incorrect subjects changing to the right answer, and 1 of 14 originally correct subjects changing to a wrong answer \( [X^2(1)=5.1, p<.05] \). This suggests that answering the problem a second time following presentation of principles acts like effective training on the same problem. The training package (training on different problems) had no apparent effect, although baseline performance was already dramatically higher than previously encountered.

Examining the reasons given for answers, and dropping categories with too few responses, there were few differences between the reasons given
with and without training ($X^2(4)=4.4$, n.s.). Although typical bad logic fell from 23% to 11%, good logic was also less frequent, changing from 13% to 7%. The proportion of intuitively correct reasons rose from 40% to 52%, and the proportion of reasons relating to risk-seeking rose from 3% to 7%.

**Study 2b: First-Year Master's Students**

**Method.** Subjects were 48 Master's students enrolled in an elective course in group behavior in organizations, 4 of whom were dropped from the analysis after reporting familiarity with the problem. As part of the course, students had experienced considerable work in negotiation and role-taking. 15 of the subjects were randomly assigned to a Control condition in which they completed the Acquiring a Company problem, then read a full training package consisting of the Used Car problem, the Jade Dragon problem, each with detailed feedback, and a summary of general principles, and finally made a second try at the Acquiring a Company problem. A second condition with 14 subjects received the training package and the problem only at the end. A third condition with 15 subjects received the same training package but a modified Acquiring a Company problem that was intended to be simpler and more concrete. As was the case in Study 2a, the response format employed a single question ("How much would you offer for the stock?").

**Results and discussion.** 4 of 15 Control subjects (27%) were correct in their first taking of the Acquiring a Company problem, compared with 7 of 14 (50%) in the Training condition, and 9 of 15 (60%) in the Training-Simplified condition. Pooling the two Training conditions, the training package had a marginally significant effect [$X^2(1)=3.2$, $p<.10$]. On the second taking in the Control condition, 6 of 15 subjects
(44%) were correct; 2 of 11 initially incorrect subjects now gave correct answers, and all 4 initially correct subjects repeated their answer (too few responses to test).

In parallel with the modestly successful results above, analysis of the reasons given for answers showed some suggestive differences between the Control and Training groups \[X^2(4)=7.6, p<.15\]. In the Control condition, only 7% of subjects offered reasons exhibiting good logic, compared to 24% of those in the Training conditions. 20% of subjects offered intuitively correct reasons in the Control condition, compared to 21% in the Training conditions. The typical errors of wrong goal and bad logic dropped from 14% and 20% to 0% and 10%, respectively. It seems that the training package did have some impact on performance, although the small numbers of subjects in each condition provide a weak test.

Study 2c: Second-Year Master's Students

Method. 40 second-year master's students from an advanced Marketing class participated during class time. 4 students who reported familiarity with the problem were dropped from further analysis. Second-year students have had considerably more coursework in economics, statistics, and other material that may enhance performance. 17 students were randomly assigned to a Control condition in which they simply solved the Acquiring a Company problem, and then did a second unrelated task so the groups would finish at the same time. The remaining 19 students completed a training package consisting of the Used Car, Jade Dealer, and summary principles prior to the Acquiring a Company problem. Further, in contrast to Studies 2a and 2b, this study used a two-question format ("Would you make an offer?" and "If you decided to make an offer, how much...?"). This format was intended to further legitimate the no-offer option.
Results and discussion. 9 of 17 students (53%) in the Control condition got the correct answer, compared to 9 of 19 (47%) in the Training condition \( [X^2(1)=0.1, \text{n.s.}] \). Nor were there any significant differences in the reasons given for answers, with 24% giving good logic in the Control condition, compared to 21% in the Training condition \( [X^2(3)=0.8, \text{n.s.}] \).

It is interesting to consider the relatively large differences in baseline performance between the undergraduates in Study 2a (47%), the first-year Master's students in Study 2b (27%), and the second-year Master's students in Study 2c (53%). These studies differed not only in the subject populations, but also in the use of one or two questions for eliciting bids. Some of these factors will be addressed in the internal analysis following the reports of individual experiments.

The training package used in Study 2 was not noticeably successful, although there were some suggestive results in Study 2b. In fact, the most dramatic result of Study 2 was the performance of the Control condition in comparison to the 10% correct responses usually obtained. Highly quantitative undergraduates and second-year Master's students achieved baseline performance of 50%, whereas first-year Master's students were correct 25% of the time.

**Study 3: The Second Training Package**

In an effort to beef up the training package, we modified the training package by creating a simple and concrete training problem called the Wallet problem. Imagine I have one bill in my wallet, and it is either a $1, $5, or $10 bill. It is equally likely to be any one of the three. You make one bid, and if your bid is equal to or higher than the value of the bill, I will give you the bill plus 50%, in exchange for your bid. If
your bid is lower, then you do not get the bill. It is easy to show that
the correct bid to maximize expected gain is $1, and it is a concrete and
visualizable situation, a discrete version of the Acquiring a Company
problem. In a second version of this, called Wallet-0, it is made more
similar to the Acquiring a Company problem by introducing the possibility
that there is no bill in the wallet, making $0, $1, $5, and $10 equally
likely, and making a bid of $0 the correct answer. Since the Wallet-0
problem shares more features with the Acquiring a Company problem
(Catrambone & Holyoak, 1988), it should encourage better performance.

Method

105 Master's students participated during class time from two
first-year courses and one second-year course at two management schools. 4 of these subjects were eliminated after they reported prior experience with the Acquiring a Company problem. The remaining 101 subjects were randomly assigned to one of three conditions: (1) Control, in which subjects first tried the Acquiring a Company problem, then received Wallet-0, Jade Dragon, summary principles, and finally a second try at the Acquiring a Company problem; (2) Training#1, in which subjects received the training package of Jade Dragon, Wallet-1, summary principles, and then Acquiring a Company; and (3) Training#2, in which subjects received Wallet-0, Jade Dragon, summary principles, and Acquiring a Company. All subjects were asked to respond using the two-question format.

Results

19 of 31 Control subjects (61%) were correct, in comparison to 23 of 33 in Training#1 (70%) and 31 of 37 in Training#2 (84%). The differences among the three conditions are suggestive [$X^2(2)=4.4$, $p<.15$]. Control subjects did no better after the training package: two subjects
switched from incorrect answers to the correct answer, and two switched from correct answers to incorrect ones.

Examining the reasons given for the responses offers a different story. Only 10% of subjects gave the correct reasoning in the Control condition, and only 6% in Training#1 with the Wallet-1 problem. However, in Training#2 with the Wallet-0 problem, 22% of subjects provided the correct reasoning. Overall reason frequencies among the three conditions were significantly different \(X^2(8)=16.1, p<.05\). Additionally, a major impact of the training packages was to increase references to risk-aversion or concern about losses. Only 6% of subjects mentioned their fear of losing money in the Control condition, but 14% in the Wallet-0 condition and 33% in the Wallet-1 condition mentioned it. Apparently, the training packages were good at scaring people as well as teaching logical reasoning!

**Study 4: Highly-Experienced Participants**

It is reasonable to assume that highly-trained people in careers that require considerable economic and financial sophistication, and the use of negotiation skills, should do better at negotiation tasks than students. As Neale and Northcraft (1987) point out, laboratory tasks give students little opportunity to demonstrate task-specific expertise, but realistic materials can evoke a richer set of strategic possibilities in experienced negotiators. In Study 4a, we examine the performance of experienced managers attending a week-long management seminar. In Study 4b, we examine the performance of investment bankers, a rather select population that should be at the pinnacle of skill, because the Acquiring a Company problem is close to their professional domain. Study 4a also provided an opportunity to examine the performance of two-person groups asked to
produce a joint answer to the problem.

**Study 4a: Managers**

**Method.** One of the exercises of a week-long management seminar was meant to demonstrate the effectiveness and pitfalls of group decision making. 30 middle and upper managers from various companies took part. Each completed three problems individually, of which Acquiring a Company was the third and by far the most difficult. Responses were elicited using the two-question format. The managers then sorted themselves into pairs, which discussed each problem until they could provide a group answer.

**Results and Discussion.** 12 of the 30 subjects (40%) got the correct answer the first time. After dyadic group discussion, 9 of 15 groups (60%) were correct. In six pairs that began with two incorrect answers, two wound up correct (33%). In six pairs that began with one right answer, four wound up correct (67%), one incorrect, and one could not reach a consensus. In the remaining three pairs that began with two correct answers, all three remained correct.

It is interesting to note that initial performance is far from perfect, suggesting that general managerial experience is not sufficient to improve performance on the Acquiring a Company problem. The ability of those with correct answers to win more than their share (but not all) of the arguments over those with incorrect answers is consistent with studies of group decision making (Laughlin & Ellis, 1986; Maier & Solem, 1962).

**Study 4b: Bankers**

**Method.** The alumni lists of a management school were used to provide 100 Master's graduates who had taken jobs in investment banking. A graduation date between 1 and 12 years prior was required, so that
subjects would have some actual work experience. The Acquiring a Company problem was mailed individually to each person, along with a cover letter and a return envelope. Responses were elicited using the two-question format.

One enterprising subject sent back a response and a letter asking whether she could give the problem to her colleagues at work. Additional forms were mailed to her, and she returned a substudy of bankers from a single bank.

Results and discussion. 36 of the original 100 mailed problems were returned. Of these, 30 were correct (83%). This represents a ceiling of 83% performance if the 36 returns are representative of all bankers, assuming the non-respondents were too busy or lacked interest, rather than that they tried, knew they failed, and therefore did not respond. The floor would be 30%, assuming the non-respondents were all wrong. The substudy in a single bank supports the first explanation, since the fledgling researcher gave out and received back 7 copies, of which 7 were correct. This strongly suggests that bankers, with their specific training and real-world experience, do quite well on the task. Of course, there are still a detectable proportion who fail to see the structure of this problem.

Internal Analyses

Although occasional effects of training are discernable, the strongest differences appear to be among the populations that we sampled, ranging from the 40 or 50% performance of Master's students to the 80% performance of bankers. In order to identify what accounts for these differences among individuals, and to examine any interactions between individual characteristics and training, we turn to an examination of background data.
collected from the college and Master's student subjects.

Method

In Studies 1, 2, and 3, subjects were asked to fill out a personal information form after completing the Acquiring a Company problem. In order to examine the effects of training in conjunction with background variables, with maximum statistical power, the data from Studies 2 and 3 were combined. Data from Study 1 were dropped because the manipulation had used incentives rather than training. Study 4 did not collect background information.

The background information consisted of gender, age, major, grade point average, college board scores (GMATs were requested, but many subjects gave GRE or SAT scores; raw scores were converted to percentiles), and numbers of courses taken in economics, statistics, decision making, and bargaining/negotiation. We also created a variable measuring whether the response was obtained in the one-question or two-question format.

We considered the possibility that different background variables might interact with the training package than would affect performance in the Control condition, and that those Control subjects who change their responses in a second try at the same problem are engaged in a different task from those who are answering the problem for the first time. We therefore conducted three separate analyses: (1) Control or baseline condition performance, to examine the effects of prior learning; (2) performance in conditions that received training, to examine the ability to learn; and (3) performance among those subjects who gave an incorrect response in a Control condition, then received training, and had a second opportunity to answer the same problem, as a second measure of the ability
Results

Due to considerable missing data, the initial analyses examined variables related to correct answers in bivariate tests, and then used variables significant at p<.15 or better in multivariate models.

Control condition performance. Initially, significant or marginally significant relationships with performance were found for economics courses \( r(107)=.17, p<.05 \), response format \( r(121)=.11, p<.15 \), decision making courses \( r(93)=-.28, p<.01 \), and quantitative test scores \( r(78)=-.13, p<.15 \). Better performance was associated with more economics courses, the two-question format, fewer decision making courses, and lower test scores.

Discriminant analysis using these four variables showed that only decision making courses and economics courses had significant effects on performance (p<.01 and p<.10 respectively). From notes written on the questionnaire, we observed that many students counted courses such as Linear Programming as decision making, so this is not necessarily an indictment of behavioral decision theory courses. The tendency for lower quantitative test scores or the two-question format to be associated with correct answers was undetectable after accounting for the other variables.

Training condition performance. Three variables were significant or marginally significant in predicting trained performance: number of economics courses \( r(154)=.15, p<.05 \), number of statistics courses \( r(154)=.11, p<.10 \), and question format \( r(161)=.10, p=.10 \). In the discriminant analysis, only number of economics courses remained significant (p<.10).

Second try performance. Despite the small number of subjects who had
an opportunity to improve their performance on the same problem, five variables were significant or marginally significant as predictors of post-training responses: verbal standardized test scores \( r(21) = .48, p < .05 \), quantitative scores \( r(22) = .30, p < .10 \), grade point average \( r(24) = .26, p < .15 \), number of bargaining/negotiation courses \( r(25) = -.28, p < .10 \), and number of economics courses \( r(33) = -.25, p < .10 \). In the discriminant analysis, only verbal test scores remained significant as a predictor of second-try performance \( p < .05 \), with higher verbal scores associated with better performance. This pattern of correlates suggests that learning after an initial try at a problem is different from learning without the initial trial.

Combining training types. Table 1 presents the combined impact of economics courses and training conditions on responses (not including second-try responses). This time, however, responses have been divided into correct with good logic, correct with other than good logic, and incorrect with other than good logic (one case of incorrect with good logic was dropped). Differences among levels of training and performance (answer and reasons) are highly significant \( X^2(6) = 25.8, p < .001 \).

Insert Table 1

Subjects with neither substantial economics background nor exposure to our training packages are correct 35% of the time, but only 9% have good logic. Our various training packages raise this to 57% correct, but still only 9% express good logic in their reasons. Thus, the disappointing conclusion is that the training packages are able to teach proper performance on the Acquiring a Company Problem, but apparently for the
wrong reasons. Generally, the reasons given for a $0 bid are risk avoidance or some vague sense that this is a bad situation.

Interestingly, subjects with economics training (three or more courses) who were in our control conditions perform at about the same level as those with no economics training who received our training package. 62% of control subjects with economics training give the correct answer, but only 10% offer good logical reasons. This again suggests an incomplete understanding that might not generalize to other situations. Most hopeful, however, is that subjects with economics training and our training package are correct 71% of the time, and 25% of these subjects express good reasons. This is the only case in which good reasoning shows up at rates above 10%. It is possible, of course, that subjects who answer correctly but give other reasons have learned some important lessons, and may have learned proper reasoning but are unable to express their reasons. If so, we would conclude that our training package was successful, and approximately equivalent to three economics courses.

**General Discussion**

**Training Better Performance**

The results of the series of studies is an example of "good news, bad news." The most obvious and dramatic good news is that performance on the Acquiring a Company problem, which previous research reported at 10% correct answers, has increased in some conditions to between 50% and 80%. The other side of this news, however, is that the increase is not wholly attributable to the training packages that were designed to teach general reasoning principles. Instead, much of the improvement is due to the following:

(a) The instructions and description of the problem were simplified
and clarified;

(b) Implicit demand characteristics that subjects make an offer have been counteracted by explicit statements and, in some cases, by a two-question response procedure. In fact, it might be argued that some of the increase in correct answering is due to demand in the opposite direction -- subjects may perceive a hint that they avoid buying the company. Question format does have a marginally-significant correlation with performance, but this disappears when number of economics courses is controlled;

(c) More sophisticated subjects were used. Specifically, these were highly intelligent and quantitatively-adept students from top-rated management schools and undergraduates from a top-rated engineering and science school. At least some had background in economics that had demonstrable impact; and

(d) Most subjects who gave correct bids did not give correct logical reasons. This suggests that the "lessons" learned and the high level of performance probably would not transfer to other tasks with similar structure (i.e., where understanding the opponent's viewpoint matters). It supports the argument of implicit demand producing right answers for the wrong reasons.

However, we have demonstrated that the training packages do work. On average, they increase the correct responses by about 15%. Further, when subjects already have an economics background of three or more courses, the training package also increases correct responses by about 20%. Most interesting of all, the most sensitive test of learning -- giving the right answer and the right reasons -- shows that enhanced performance occurs only for those students who have the economics background and
receive the training package. On this measure, correct performance goes from about 9% to 25%.

What is Learned?

Examining the various training packages, there is some evidence that more concrete and understandable examples are more effective, and examples that contain more specific similarities to the target problem are more effective. For example, the Wallet problems seem to work better than the Used Car problem. Further, the Wallet problem employing a zero answer seemed somewhat better than the similar problem without a zero answer. The former captures more of the structure of the Acquiring a Company problem.

Of course, the issue is whether subjects learn a specific lesson about bidding zero in this case, or whether they learn a general lesson about the viewpoint of the opponent, goals, and decision trees. Analyses of the reasons given for responses suggest that subjects tend to learn that there are risks in the problems, or pick up the hint that a bid of $0 is "safe." Only a small proportion of subjects offered reasons that evidenced a generalizable understanding of the problem. Of course, it is entirely possible that more subjects understood the proper reasoning, but did not write it down (e.g., the written response "too risky" could be the result of anything from intuition to formal analysis).

Better Ways to Train Negotiators

Although we attempted to create an effective learning environment, employing a combination of specific examples and general principles, other modalities for learning might be more effective. For example, more personalized feedback directed at the subjects' specific answers could be employed. Alternatively, subjects could be given more concrete experience
trying out their new skills. Or, subjects could be given a more concrete learning experience about the perspective of the opponent.

One recent study has had some success employing computer-assisted education to provide such learning experiences on the Acquiring a Company task. Ball et al. (1990) conducted a follow-up to their study of subjects playing a computerized game version of the Acquiring a Company problem. In this study, one group of subjects was given 20 trials as the acquirer and 20 trials as the target (to give practice in the opposite role) prior to playing 20 trials as the acquirer on the next day, while a second group of subjects had only prior practice as the acquirer. Those given "role reversal" experience were significantly able to learn (percentage of learners went from 9% on practice trials to 37%) whereas those given only experience as acquirers showed nonsignificant learning (6% to 12%). This suggests that concrete experience with different viewpoints, coupled with immediate personalized feedback, is indeed helpful. However, the experience and feedback were on the same task and may not generalize to other negotiation situations. Further, nearly two-thirds of subjects still gave wrong answers.

Prospects for Negotiation Practice

The results of this series of studies reiterates the difficulty of training good negotiation skills. The mental heuristics, illusions, and biases that are part of dealing with a complex world are ingrained and hard to change. We further observe that subjects are very sensitive to instructions and wording, and can be easily misled or subject to demand characteristics.

A sound base of formal courses, such as economics, seems useful but not sufficient. Such courses provide a foundation, but without specific
further instruction and cues to application, they are not notably successful in enhancing negotiation skills. Interestingly, there is little evidence that formal courses in decision making (as defined by the subjects and predominantly not behavioral in nature) or bargaining/negotiation have much impact.

However, it is also apparent that learning does occur, and is enhanced by clear instructions, repeated examples with personal application and feedback, and features that are shared with situation to which generalization is desired (such as the presence of a $0 possibility). Master's students with three or more economics courses and exposure to our training package gave correct answers over 70% of the time; this approached the performance of a select group of bankers whose training and real-world experience made them ideally suited to perform well.

Researchers should continue developing ways to teach negotiation skills both as a means to improve negotiation practice, and as an illuminating exercise for negotiation theory. New techniques, such as the role-reversal and computerized-feedback study of Ball et al., should be developed and explored. Extension to other aspects of decision making and negotiation should also be sought.
REFERENCES


Table 1

Impact of Economics Courses and Training Packages on Performance

<table>
<thead>
<tr>
<th>Training</th>
<th>Correct Answer</th>
<th>Incorrect Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good Logic</td>
<td>Weak Logic</td>
</tr>
<tr>
<td>0-2 Econ/No Training</td>
<td>7 (9)</td>
<td>20 (26)</td>
</tr>
<tr>
<td>0-2 Econ/Training</td>
<td>9 (9)</td>
<td>49 (49)</td>
</tr>
<tr>
<td>3+ Econ/No Training</td>
<td>3 (10)</td>
<td>15 (52)</td>
</tr>
<tr>
<td>3+ Econ/Training</td>
<td>13 (25)</td>
<td>24 (46)</td>
</tr>
</tbody>
</table>

Note - numbers in parentheses are percentages of row totals.
Appendix 1: Original Instructions For Acquiring A Company Problem

In the following exercise you will represent Company A (the acquirer), 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 known. 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: Revised Instructions For Acquiring A Company Problem

You represent Company A. Your company currently is considering making an offer to buy Company T. You are unsure how high an offer to recommend, because the exact price per share of Company T is unknown to your company.

You only know that the value of Company T is somewhere between $0 and $100 per share. The shares could be worth any value in this range and all values are equally likely. However, whatever the value of Company T is under its current management, it would be worth 50% more in your company's hands (due to strategic fit and enlightened management). For example, if Company T is worth $100/share under its current management, it would be worth $150/share to Company A.

Company A can make only one offer for Company T. If the offer is turned down, there will not be an opportunity to revise the offer. The offer would be made without knowing the value of Company T. The management of Company T, however, knows exactly its own value per share when responding to an offer. They will accept any offer that is greater than or equal to the price per share under current management; otherwise, the offer will be rejected and there will not be another chance to bid.

You should not think of Company A as competing with other bidders to acquire Company T.

As a representative of Company A, you are considering recommending offers ranging from $0/share to $150/share. The goal of your company is merely to get the highest expected benefit out of the deal, that is, to make a good business decision. It is not necessary for Company A to make an offer; there are no negative consequences for recommending no offer.

Would you recommend that Company A make an offer? YES NO

If yes, what offer per share would you recommend?