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Deception and Retribution in Repeated Ultimatum Bargaining

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This paper investigates the dynamics of deception and retribution in repeated ultimatum bargaining. Anonymous dyads exchanged messages and offers in a series of four ultimatum bargaining games that had prospects for relatively large monetary outcomes. Variations in each party's knowledge of the other's resources and alternatives created opportunities for deception. Revelation of prior unknowns exposed deceptions and created opportunities for retribution in subsequent interactions. Results showed that although proposers and responders chose deceptive strategies almost equally, proposers told more outright lies. Both

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were more deceptive when their private information was never revealed, and proposers were most deceptive when their potential profits were largest. Revelation of proposers' lies had little effect on their subsequent behavior even though responders rejected their offers more than similar offers from truthful proposers or proposers whose prior deceit was never revealed. The discussion and conclusions address the dynamics of deception and retribution in repeated bargaining interactions.

Bargaining and negotiation are common events in organizations and in everyday life. As a result, people have developed a number of widespread beliefs and expectations about the nature of the bargaining and negotiation process (Murnighan, 1992; Neale & Bazerman, 1991). Most negotiators, for instance, expect that their interactions will be competitive, even if they (unknowingly) have many interests in common (e.g., Thompson & Hastie, 1990). Consequently, many negotiators believe that they should hide their true reservation prices or the depth of their interest in reaching an agreement. In general, negotiators tend to be consciously strategic as they attempt to avoid revealing any private information. In formulating their strategies, perceptions of competition may lead them to consider and possibly choose unethical acts (Lewicki, Litterer, Minton, & Saunders, 1994; Murnighan, 1991). This paper examines some of the antecedents and consequences of these negotiation strategies by investigating the incidence and consequences of deceit in repeated bargaining interactions.

We define deception as the transmission of information that implicitly encourages another party to make incorrect conclusions (Murnighan, 1991). Deception is one of several strategies that negotiators can use to attempt to tip the balance of information in their favor (Lewicki et al., 1994). The variety of less-than-truthful negotiation strategies includes misrepresentation (presenting highly desirable outcomes as the only outcomes a negotiator might accept), bluffing (promising or threatening an action that the negotiator will not enact), and lying (making explicitly false statements). Negotiators may choose these strategies to give themselves a bargaining advantage that they would lose if their counterpart knew their private information. When and why they might choose such strategies, then, is a central concern for negotiation research.

Although the theoretical literature on deception in negotiation is relatively sparse, two perspectives, one offered by Lewicki et al. (1994) and the other by Murnighan (1991), identify three common antecedents to deception: greed, competition, and experienced injustice. Both perspectives suggest that self-interested negotiators may be motivated to engage in unethical action to increase their own outcomes and that self-interest can dominate a person's concerns for cooperation, fairness, or altruism. Research by Seybolt and Murnighan (1990) showed that negotiators often experience a competitive urge to do better

than their counterparts. Although this urge does not necessarily lead to deception, research by Lewicki and Spencer (1990) indicated that negotiators who expected to interact with a competitive other rated more tactics as ethical and indicated more willingness to use them than did negotiators who did not expect to interact with a competitive other. It appears that as the strength of this drive increases so does the probability of unethical behavior.

Both perspectives invoke perceived injustice as an impetus for deceptive action, suggesting that people justify acting unethically when they feel that a counterpart has taken unfair advantage of them. Thus, when experienced injustice occurs in combination with greed or expected competition or both, one might reasonably expect additive effects, thereby increasing the likelihood of unethical action.

Murnighan (1991) identifies uncertainty as an additional factor, noting that unethical action becomes increasingly unlikely as its potential results become more uncertain. People are more likely to act unethically when they feel that such action will assure them of what would otherwise be an uncertain outcome.

Finally, Lewicki et al. (1994) predict that when power differs parties with more power are more likely to act unethically. They attribute this result to the long-held belief that power corrupts and point to the data of Crott, Kayser, and Lamm (1980), which shows that powerful negotiators bluff more and communicate less than their weaker counterparts. This behavior is consistent with the notion that high power people feel that they can act with impunity to achieve their own goals because they do not need to be concerned about the social consequences of their actions (Keltner, Gruenfeld, & Anderson, 2000). High power individuals are also more likely to use stereotypes and less likely to use individuating information when judging others (Fiske, 1993). When negotiating, high power individuals tend to be less attentive to their counterparts' underlying interests than are low power negotiators (Mannix & Neale, 1993; Sondak & Bazerman, 1991). Tendencies to stereotype and ignore the interests of low power others are consistent with Keltner et al.'s (2000) hypothesis that high power individuals are more likely to engage in heuristic rather than systematic processing when dealing with lower power others. Although heuristic processing is ethically neutral, the fact that it leads to a tendency to overlook the interests of others suggests that such processing may be more likely to be associated with unethical acts (e.g., Murnighan, Cantalon, & Elyashiv, 2000).

Although the empirical literature on the consequences of deception in negotiation is limited, it does suggest that deception is not always beneficial to the deceiver, particularly in distributive, strictly competitive negotiations. Roth and Murnighan (1983) and Schweitzer and Croson (1999), for instance, have shown that inexperienced negotiators are not particularly effective when they try to be deceptive. In both studies, attempts at deception led to more disagreements (rather than increased outcomes for deceivers) even though any agreement would have provided substantial monetary outcomes.

Most of the research on deception and negotiation has investigated one-time

interactions between strangers. In many real world negotiations, however, individuals have the opportunity to negotiate with each other repeatedly. Occasionally, they may even obtain private information about one another's outcomes, which tells them whether or not they have been deceived. In such situations, repeated interactions provide not only the opportunity for negotiators to develop reputations for honesty and trustworthiness, but also for them to exact retribution on those with negative reputations. As far as we know, no one has investigated the important practical problem of deception detection and its implications (see O'Connor & Carnevale, 1997), which are the foundations for the current study. In particular, this project was designed to document the incidence of deception and retribution in repeated consequential bargaining interactions, to identify conditions that stimulate deception, and to investigate deception's consequences on future bargaining processes and outcomes.

The Cognitive Dynamics of Deceit

Many people believe that intentional deceit, dissembling, or dishonesty are either permissible or probable during negotiations. Dees and Cramton (1991) argued that "moral pragmatists," people who are neither saints nor scoundrels, may use what they call the mutual trust principle to justify being deceptive. The principle states that individuals should not have to take significant risks or incur significant costs if they have no reasonable grounds for trusting that others will (or would) take the same risk or make the same sacrifices. Although the principle has been attacked (Boatright, 1992; Gibson, 1993; Strudler, 1995) and defended (Dees & Cramton, 1995), the assessment of others' ethics remains an important part of formulating a negotiation strategy (e.g., Lewicki and Robinson, 1998). This assessment is particularly difficult, almost by definition, because negotiators typically try to conceal their deceptions.

Regardless of the reasons for the inclination to deceive, cognitive justifications soon follow deceptive action. (See De Dreu, Nauta, & Van De Vliert, 1995, for a discussion of self-serving biases in evaluations of conflict behavior.) Tenbrunsel (1998) suggests that people retrospectively justify cheating by convincing themselves that their counterpart had dishonest intentions and was also willing to deceive. Even more extreme are the findings of Sagarin, Rhoads, and Cialdini (1998), which show that when one partner has lied to another, the liar was more likely to judge the lie's target as less honest than untargeted individuals. These perceptions set up a vicious cycle whereby individuals' own temptations bias their assessments of the other parties' intentions. One goal of this research, then, was to investigate the situational determinants of both deceptive tactics and the perceptions that one's counterparts are deceptive.

The Current Study

Investigating the processes of deception and retribution requires a rich, but controlled negotiation context. For many good reasons, current negotiation research has typically emphasized experimental control and has not investigated extended interactions. [Several counterexamples exist, especially recent

work by Brett, Shapiro, & Lytle (1998).] The current experiment used a strategy that incorporates many elements of real world negotiations but is sufficiently restricted to allow for a series of hypothesis tests. Specifically, we investigate negotiations with the following characteristics: (1) Two parties have the opportunity to reach a series of mutually beneficial agreements, i.e., the negotiations have positive bargaining zones (Walton and McKersie, 1965); (2) Parties know their own outcome possibilities and options to an agreement and some know their counterparts' outcomes or options; (3) Some parties have private information that could give their counterparts a serious strategic advantage and thus, they should be motivated to both hide their own private information and discover their counterparts'; (4) Parties can communicate with each other to deceive, to threaten, or to openly share information; (5) The potential payoffs are sizable; and (6) Over time, some negotiators discover how well or how poorly they have done in comparison to their counterparts.

To provide a reasonable amount of experimental control, we used the ultimatum game as the negotiation context.[1] As in a typical ultimatum experiment (see Roth, 1995 for a review), we randomly assigned individuals to positions as proposers or responders. Proposers offered any part of a specified amount of money that they wished to responders. Responders could either accept or reject this offer. An acceptance led to a division of the money as stipulated by the proposer; a rejection meant that the proposer received nothing and the responder received a prespecified outside option.

In the current study, participants interacted with the same individual for four successive negotiation rounds; one person was always the proposer and the other was always the responder (although bargainers did not know which role they would be assigned to until just prior to each round). Proposers divided resource pies of $27, $47, $25, and $13 (in that order for rounds 1–4) and responders received a small "outside option" of $2, $3, $5, or $1 (in that order for rounds 1–4) if they rejected a proposer's offer.

Game theory uses backward induction to analyze these games. If more money is preferred to less, responders should accept any offer that exceeds the value of their outside option. If proposers know the value of the outside option, they should offer only the size of the option plus epsilon (a very small amount), which responders should accept. In the incomplete information conditions, when proposers do not know the size of the outside option but do know its possible range ($1 to $8), equilibrium analysis suggests that they should offer either the maximum outside option ($8) plus epsilon or half of the pie, whichever is smaller (see Appendix A for a derivation of this equilibrium). Because proposers knew that the outside options in this study were relatively small, game theoretic, equilibrium analysis suggests that, in terms of outcome possibilities, proposers have more leverage than responders do. For instance, they could

[1] The terms bargaining and negotiation are used interchangeably in this paper. Bargaining contexts like ultimatum games certainly restrict negotiators' interactions. At the same time, they include many elements of real world negotiations and therefore provide a particularly useful experimental procedure.

offer $9 when they were dividing $47 and expect it to be accepted, because rejecting such an offer would be costly to responders.

In this experiment, the proposers always knew the amount they would divide (the size of the pie) and the responders always knew the amount of their outside option. In the complete information conditions, the parties were aware of their counterparts' information; that is, proposers knew the values of the outside options and responders knew the pie sizes. In the partial information conditions, they were given only a range of possible values for their counterparts' information. Uninformed responders knew that the pie could range from $10 to $50; uninformed proposers knew that outside options could range from $1 to $8. Each party had common knowledge about the other party's information; no one was uncertain about what their counterparts knew or did not know.

Responders could send a single written message before receiving an offer, allowing them to make threats, claims about their outside option, or other demands. Proposers could send a message of their own, in conjunction with their offer. Analysis of the messages allowed tracking of deception and its consequences. Participants initially expected only two bargaining trials, with one (randomly selected) determining their earnings. After learning which of the two was selected for payment, negotiators in the revelation conditions learned the value of the previous pies or outside options. Then they played two more bargaining games with the same partner in the same proposer and responder roles.

Strategic Contingencies

Having information can benefit the informed party and can harm the other party. For instance, knowing the size of the pie gives responders the opportunity to make more believable threats as well as the opportunity to argue for what they think is a fair outcome. Although responders can always threaten proposers, this power diminishes when they do not know the size of the pie. Unless proposers reveal their private information, responders cannot evaluate the relative value of the offers they receive, and proposers are aware of this inability to evaluate.

Knowledge about the distribution of information (i.e., who knows what) can also be critical. For instance, proposers who know that responders do not know the size of the pie can act with greater impunity than they might otherwise, especially if they believe in equilibrium analyses. Previous research on ultimatum games (e.g., Straub & Murnighan, 1995; Pillutla & Murnighan, 1995; Croson, 1996) supports this logic; proposers offer significantly less when they know that responders have no knowledge of the pie size.

Responders have fewer strategic opportunities. They can misrepresent the size of their outside option, but only up to $8, the maximum possible. They can also threaten to reject offers that they judge to be too small. Game theory suggests, however, that such threats should not influence actual accept–reject decisions in the short term. When responders demand more than their outside

option, offers that exceed their option provide them with better economic outcomes and, from an economic perspective, should be accepted. However, reputations may become relevant in repeated interactions and threats can portend more frequent rejections, particularly if responders are concerned with saving face. Thus, responders may be more likely to follow through with their threats in earlier rounds to establish a reputation for themselves.

Although misrepresenting outside options by responders has limited strategic value in this study, proposers might significantly bolster the acceptability of their offers by lying or deliberately suggesting that the pie is relatively small. When this happens, revelation of private information enlightens responders of the deception and allows them to enact retribution by rejecting subsequent offers. All of these possibilities contribute to the rich interchange that we expected to observe in these bargaining interactions. They also provide the basis for a series of hypotheses.

We expect to replicate prior ultimatum results, including: (1) offers will increase as pie size (Straub & Murnighan, 1995) and proposer wealth increases (Kahneman & Tversky, 1979); (2) offers will decrease when the pie size is unknown to responders (Straub & Murnighan, 1995; Croson, 1996); and (3) smaller offers will increase the likelihood of rejection (Roth, 1995). These hypotheses provide a foundation for those that follow. For clarity, we present the new hypotheses in three sets, hypotheses involving (1) the effects of knowledge (of pie size and outside options); (2) the effects of revelation (when pie size and outside options were unknown) on offers, acceptances, and negotiator tactics; and (3) the relationship between deception and negotiators' evaluations of one another.

Knowledge Hypotheses

Differential knowledge about the size of the pie and outside offers is expected to have the following impact on bargaining behavior.

Hypothesis 1. Proposers who are aware that responders know the size of the pie will offer more than proposers who are aware that responders do not know the size of the pie.

Hypothesis 2. Responders will make more specific requests and stronger threats when they know the size of the pie than when they do not know its size.

Hypothesis 3. When proposers know the size of responders' outside options, they will offer less than when they do not know the size of these options.

Knowing that one's counterpart lacks information increases negotiators' power and gives them the opportunity to be deceptive (Lewicki et al., 1994). Deception is a less likely tactic when one party knows that the other knows their private information (Murnighan, 1991).

Hypothesis 4. Proposers will be more deceptive when the pie size is unknown and responders will be more deceptive when the outside option is unknown, than when these amounts are known.

Additionally, when proposers do not know responders' outside options, responders are relatively more powerful and thus may make more specific requests and stronger threats.

Hypothesis 5. Responders will make more specific requests or stronger threats or both when proposers do not know the size of their outside options than when they do know.

A cognitive justification logic (Tenbrunsel, 1998) suggests that negotiators who have private information, and thus, the opportunity to be deceitful, will also think that their counterparts are likely to be deceitful.

Hypothesis 6. Negotiators are more likely to voice doubts about the honesty of their counterparts' claims when their own resource amounts (size of the pie or the outside option) are unknown than when they are known.

Revelation Hypotheses

Revelation of previously private information after a bargaining round is over should have its greatest impact on negotiators when deceit has occurred in prior rounds. For example, once revealed, a deceitful proposer may experience guilt or embarrassment or both and, as a result, be more likely to offer "apology payoffs," i.e., a greater percentage of the pie in subsequent rounds. Revealed deceivers may be more likely to make explicit apologies as well, in hopes of being forgiven (e.g., Bottom, Daniels, Gibson, & Murnighan, 1999).

Hypothesis 7. Proposers whose deceit is revealed will increase the relative size of their offers and will offer more apologies than will proposers whose deceit has not been revealed.

Responders who find that they have been deceived, however, are likely to be angry (Pillutla & Murnighan, 1996) and therefore less receptive to proposers' subsequent entreaties. As they have few strategic opportunities, their primary chance for retribution comes from rejecting subsequent offers.

Hypothesis 8. Responders who learn that they have been deceived will be more doubtful of proposers' ensuing statements and will reject more of their subsequent offers than will responders who do not learn that they have been deceived.

Deceit and Evaluation Hypotheses

Negotiators who have been deceived are likely to evaluate the other person more negatively than will negotiators who have not been deceived.

Hypothesis 9. Those who have been deceived will view their counterpart as less trustworthy, less believable, and will be less likely to want to interact with them in the future than will those who have not been deceived.

Hypothesis 10. Those who have used deception will be rated as less cooperative and more competitive than those who did not deceive.

METHOD

Experimental Design

The experiment employed a 3 (Pie Amount: known; not known but revealed; not known and not revealed) × 3 (Outside Option Amount: known; not known but revealed; not known and not revealed) × 4 (Rounds) design. Knowledge of pie and outside option amounts were between subject factors and rounds was a within subject factor. The pies were $27 in round 1, $47 in round 2, $25 in round 3 and $13 in round 4. Corresponding outside options were $2, $3, $5, and $1. Revelation occurred after rounds 2 and 4. For all of the experimental conditions, both parties were always aware of the extent of their counterparts' information. For example, when the pie amount was not known but revealed to responders after round 2 and the outside option was known, both parties knew that the proposer knew the responder's outside option and they both knew that responders did not know the pie amount when making the decision to accept or reject the proposer's offer. Both were also aware that the pie amounts from rounds 1 and 2 had been revealed to responders prior to round 3.

Participants and Procedure

Participants were 220 undergraduate business students (111 male, 109 female) at a large midwestern university who volunteered and received course credit as well as cash payments for their participation. Participants' ages ranged from 19 to 47 with a mean age of 21.

Experimental sessions lasted 1.5 hours and included from 8 to 18 participants. Participants came to a networked computer laboratory and were randomly assigned to stations fitted with physical barriers in front and on both sides. Each pair of linked terminals, one for the proposer and one for the responder, was associated with a particular experimental condition.

Two experimenters, one male and one female, were present at all sessions. Participants received an oral and written overview of the experimental procedure. They were told that they would be participating with the same partner in two negotiations, that their interactions would be conducted via computer, that the other person would remain anonymous to them, that they would be randomly assigned to the roles of proposer or responder before each negotiation, and that one of their two negotiations would be randomly selected to be paid. Participants played the same role (proposer or responder) for all negotiations, even though they did not know until just prior to each negotiation which role they would be assigned. In some treatments the sizes of the pie and outside option were known to the negotiators, in others they were not. All participants were aware that pie sizes could range from $10 to $50 and outside options could range from $1 to $8.

Responders were told to send proposers any message they wished prior to proposers sending their offers. This gave responders an opportunity to make threats, to state a specific amount they would like to be offered, or to reveal or misrepresent the size of their outside option. Proposers replied with an offer

and a message (which could include truth, deception, doubts, threats, apologies, etc.). Then responders either accepted or rejected the offer. Thus, each negotiation had three interactions: responder's message, proposer's offer (and message), and responder's choice. If responders accepted, they received the amount offered and proposers received the pie less the offer. If responders rejected, they received their outside option and proposers received nothing. The instructions clearly explained these contingencies. The roll of a die in each experimental session determined which of the first two negotiations would be paid.

The experiment began with participants completing informed consent forms, providing demographic information, hearing instructions, and answering questions to make sure they understood the procedures. Proposers then waited for responders to send the first message, which appeared on both the proposer's and the responder's screens. The computer saved all of the messages, offers, acceptances, and rejections.

Following the lottery for the first two negotiations participants in the revealed conditions were told the pie sizes or outside options or both for the first two negotiations. Then all participants completed a short questionnaire consisting of items on 9-point Likert scales (1 = not at all, 9 = very) assessing how satisfied they were with the outcome and the process, how cooperative, competitive, and trustworthy their counterparts were, how much they would like to interact with them again, and how much they believed that the other person was telling the truth.

To participants, this appeared to be the end of the experiment. However, the experimenter then noted that time remained and two more rounds of negotiation could be played with the same partner. The procedures would be the same as before and one of these next two negotiations would also be paid. All participants willingly agreed to participate for two more rounds.

The same procedures were used for the second set of negotiations. Another roll of the die determined which of the two negotiations would be paid, pie and outside amounts were again revealed (in the appropriate conditions), and another questionnaire was administered. Average payments were \$27.37 (SD = \$10.91) to proposers and \$21.26 (SD = \$7.84) to responders. To protect their anonymity, participants were paid and debriefed individually, in a separate cubicle at the end of the experimental session.

Coding of Negotiation Transcripts

The negotiations were coded for the occurrence of several variables, including:

Specificity of responder requests. Responder requests were coded for their specificity. A 0 was assigned if responders did not make a request; a 1 if they requested a fair (but not specific) amount; a 2 if they suggested a specific split (such as a 50–50 split or some other proportion); and a 3 if they requested a specific dollar amount.

Responder threats. A 0 was assigned if responders made no threat; a 1 for a mild threat (e.g., the responder reminds the proposer that if they reject

proposer's offer the proposer will receive nothing); and a 2 for a direct threat (e.g., "if you don't offer me X, I'll reject your offer").

Responder and proposer deceit. A 0 was assigned if a message included no lying or deception; a 1 for deception (i.e., the responder saying the outside option was large if it was only $1, $2 or $3, or the proposer saying the offer was fair when it was much less than half); a 2 for an outright lie (saying the outside offer or the pie was a specific incorrect amount).

Responder and proposer doubts. was assigned if no doubt was expressed; a 1 if one party suggested that they did not believe that the other was telling the truth.

Proposer apologies. A 0 was assigned for no apology; a 1 if a proposer apologized.

Proposer and responder verbosity. A word count determined the length of proposers' and responders' messages.

Two raters independently coded the negotiations of the first 30 dyads (120 negotiations). Interrater reliability was .95 (Cronbach's alpha); the only disagreement between raters was on the coding of responders' threats (none vs. mild). After discussion, reliability increased to .98. One rater then coded the remaining 320 negotiations.

RESULTS

A 3 (Pie Amount) × 3 (Outside Option Amount) × 4 (Rounds) repeated measures ANOVA was used for data analysis. Dependent measures included the size of the offers (in absolute dollars or as a percentage of the pie) and whether they were accepted or rejected. Other dependent measures included the variables coded from the transcripts (requests, threats, deceit, doubts, apologies, and verbosity) and participants' responses to questionnaire items. Prior to the hypothesis tests and other results, we present some descriptive statistics and analysis that corroborate prior ultimatum findings.

Table 1 presents the mean outcomes for proposers and responders by round. Although the different pie sizes and the differential power associated with the proposer and responder roles contributed to significant round and role main

TABLE 1

Proposer and Responder Earnings by Round

Round	Pie size	Proposer earnings	Responder earnings
1	$27	$13.36[a]	$10.27[b]
2	$47	$26.13[c]	$18.43[d]
3	$25	$9.80[e]	$10.33[e]
4	$13	$5.78[f]	$6.06[f]

Note. Within each row cells with a different superscript differed from one another at $p < .001$.

TABLE 2

Offer Amount, Percent Offered, and Percent of Offers Accepted by Round

Round	Pie size	Mean offer	Mean % offered	% Offers accepted
1	$27	$11.22[a]	41.6%[a]	87%[a]
2	$47	$19.04[b]	40.5%[a]	95%[b]
3	$25	$11.53[a]	46.1%[b]	77%[c]
4	$13	$6.57[c]	50.6%[c]	89%[a]

Note. There was a significant effect for Round for Mean offer, Mean % offered, and % Offers accepted. Means with different superscripts within each column differed from one another at $p < .01$.

effects, a round by role interaction ($F(3, 217) = 35.30$, $p < .001$) indicated that the proposers' outcomes were significantly larger than responders' in rounds 1 and 2 but not in rounds 3 and 4 (see Table 1).

The percentage of the pie offered did not differ in rounds 1 and 2, but increased significantly in round 3 and again in round 4. The first of these increases is consistent with effects for proposer wealth. Overall, offers were accepted 87% of the time. There was a main effect for rounds on acceptances ($F(3, 303) = 6.21$, $p < .01$), with significantly more acceptances in round 2 and rejections in round 3 than in the other rounds (see Table 2). In percentages, accepted offers were significantly larger than rejected offers in rounds 2 and 4 but not in rounds 1 and 3 (see Table 3). These findings suggest that responders may have rejected round 1 offers to establish a reputation for themselves for future rounds (even though they did not know in advance that they would again be responders). Although reputation establishment might also explain, at least in part, the rejections in round 3, additional analyses on the effects of revelation after round 2 will suggest that retribution for past deception is a more likely explanation.[2]

TABLE 3

Amount and Percent Offered of Accepted and Rejected Offers by Round

		Average accepted offer			Average rejected offer		
Round	Pie size	Mean	Mean % offered	(n)	Mean	Mean % offered	(n)
1	$27	$11.21[a]	41.6%	(96)	$11.28[a]	41.8%	(14)
2	$47	$19.41[b]	41.3%	(104)	$12.67[c]	26.5%	(6)
3	$25	$11.48[a]	46.2%	(85)	$11.68[a]	46.8%	(25)
4	$13	$6.72[d]	51.7%	(98)	$5.33[e]	41.0%	(12)

Note. Within rows, accepted and rejected offers with different superscripts differed at $p < .005$.

[2] A reviewer suggested that reputation effects may explain rejections in round 3, independent of the manipulations that revealed deceit. Although reputation effects cannot be entirely ruled out, there is little value for responders (especially those who have not been deceived) to follow through with their threats, because they do so at a personal cost. Also, responders who rejected earned less on subsequent rounds than responders who accepted did. Round 3 rejecters earned an average of $5.85 in round 4; acceptors earned $6.12. Similarly, round 1 rejecters earned an

Proposers and responders chose deceptive strategies (deceiving or lying) almost equally. Proposers were deceptive 60 times (out of 440 opportunities; 13.6%); responders were deceptive 61 times (13.9%). There was more deception overall in rounds 1 and 2 (79 instances) than in rounds 3 and 4 (42 instances). This pattern of deception was significant for responders ($F(3, 303) = 2.91$, $p < .05$) but only marginally for proposers ($F(3, 303) = 2.11$, $p < .10$). More interesting is the fact that deceptions were qualitatively different; responders were more likely to be deceptive without outright lying (38 deceptions vs 23 outright lies) while proposers were four times as likely to outright lie as they were to be deceptive (48 outright lies vs. 12 deceptions), $\chi^2 (1, N = 121) = 4.44$ $p < .05$).

Knowledge Hypotheses

Hypothesis 1 suggested that when responders knew the size of the pie, proposers would offer more than they would when responders did not know its size. This predicted main effect was not significant ($F < 1$); however, a significant pie knowledge by round interaction ($F(6, 303) = 2.29$, $p < .05$) indicated that proposers offered significantly more in round 2 (when pie = \$47) when responders knew the pie amount ($M = 44.9\%$) than when they did not know (not known revealed, $M = 38.1\%$; not known, not revealed, $M = 38.9\%$); a t test comparing the known to the two unknown conditions in round 2 was significant ($t (108) = 2.18$, $p < .02$). Thus, proposers exploited responders' lack of knowledge only when the stakes were high.

Two significant main effects supported Hypothesis 2, informed responders would make more specific requests and stronger threats. Responders' threats were stronger when they knew the pie size ($M = .92$) than when they did not (not known, revealed $M = .75$; not known, not revealed $M = .54$), $F (2, 101) = 3.38$, $p < .05$, and their requests were also more specific, $F(2, 101) = 8.57$, $p < .001$ (i.e., they were more likely to request a specific dollar amount). In addition, a significant knowledge by round interaction for responder requests ($F(6, 303) = 2.85$, $p < .01$) indicated that while informed responders' requests became more specific from round 1 to round 2 and remained high, uninformed responders who never learned the size of the pie made considerably less specific requests in the last two rounds (see Fig. 1).

Hypothesis 3, that proposers' knowledge of the size of responders' outside options would lead them to make smaller offers, was supported by a significant main effect ($F(2, 101) = 3.62$, $p < .05$). Knowledgeable proposers offered an average of 41.2% of the pie; proposers who did not know responders' outside options (but were told later) offered an average of 44.4%; and proposers who never knew their outside options offered an average of 46.6%. A significant round by outside option interaction for percentage offered $F(6, 303) = 3.16$, $p < .005$ (see Fig. 2) shows that proposers exploited this knowledge in every round except round 3.

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average of \$20.00 in round 2; acceptors earned \$22.63. Rejecting an offer hurt the proposer, but it did not help the responder in subsequent rounds.

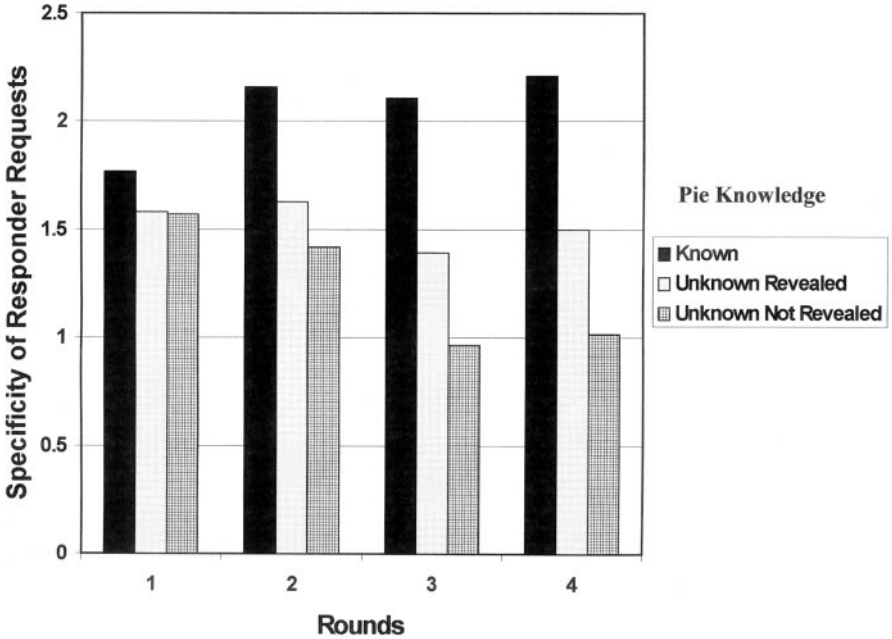

FIG. 1. Pie knowledge by round interaction for specificity of responder requests.

The data also support Hypothesis 4. Proposers were more deceptive when the pie size was not known and responders were more deceptive when their outside options were not known than when these amounts were known. For proposers, $F(2, 101) = 8.31$, $p < .001$; not known, revealed $M = .33$; not known, not revealed $M = .43$; known $M = .07$. For responders, $F(2, 101) = 6.52$, $p < .005$; not known, revealed $M = .25$; not known, not revealed $M = .26$; known $M = .06$.

Hypothesis 5, that responders would make more specific requests or stronger threats when their outside options were not known, was not supported ($F(2, 101) = 1.99$, n.s.).

Hypothesis 6 proposed that uninformed parties would be more doubtful of claims made by their counterparts. Support of this hypothesis required a significant pie knowledge by outside option knowledge interaction for doubts, which did not occur, primarily because proposers expressed very few doubts about responders' claims. A main effect for pie knowledge ($F(2, 101) = 3.88$, $p < .05$), however, indicated that responders were more doubtful when they did not know the size of the pie and this information was never revealed ($M = .12$) then when it was revealed ($M = .07$) or known from the start ($M = .01$). Thus, responders were suspicious when they knew that proposers had an opportunity to exploit their lack of knowledge. A marginal effect for rounds, $F(3, 303) = 2.47$, $p = .06$, also suggests that responders had a tendency to be more doubtful of proposers' claims in rounds 3 and 4 (Ms = .10 and .09, respectively) than in rounds 1 and 2 (Ms = .05 and .03).

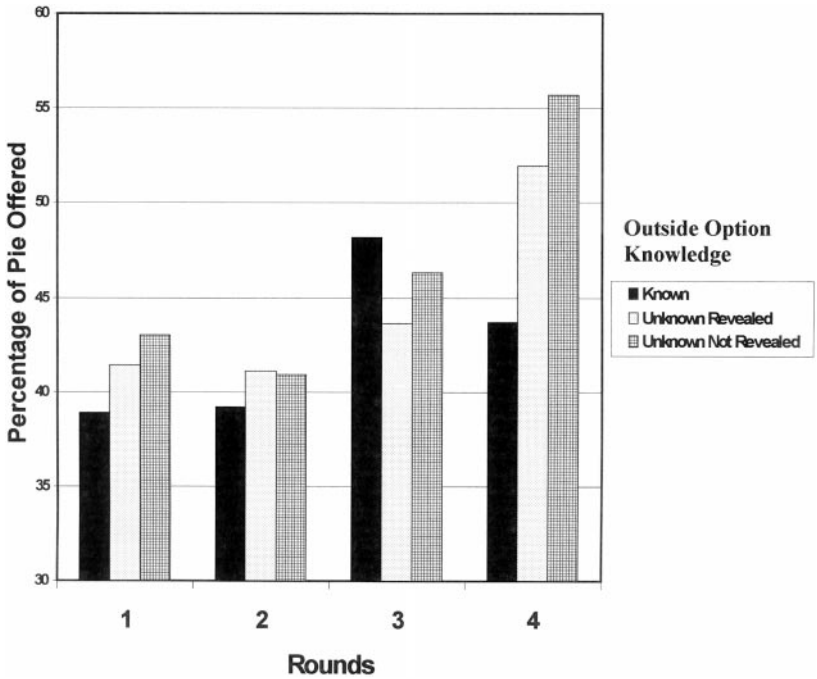

FIG. 2. Outside option knowledge by round interaction for percentage of pie offered.

Revelation Hypotheses

We classified proposers as deceptive if they had either lied or been deceptive about the size of the pie in rounds 1 or 2. Hypothesis 7 predicted that revelation would increase deceptive proposers' offers and lead them to apologize more than deceivers whose deceptions were not revealed. Neither prediction was supported. Although exposed liars increased their offers by 20% from round 2 to round 3 (SD = 12%) and unexposed liars increased their offers only by 10% (SD = 23%), this difference was not statistically significant, $F(1, 24) = 1.49$, n.s. Although the correlation between deceptiveness and apologies was significant ($r = .25$, $p < .01$), apologies by proposers were too rare to analyze (five liars apologized in round 3; two apologized in round 4; of these seven apologies, five came from exposed liars).

Hypothesis 8 suggested that responders who learned that they had been deceived would be more doubtful of proposers' claims and would reject more of their subsequent offers. This hypothesis was supported for rejections but not for doubts. There were no differences in expressed doubts in round 3 between responders who learned they had been lied to and those who did not, $F(1, 24) < 1$, n.s.; both raised doubts about 20% of the time.

Deceived responders showed their displeasure not by words but by deeds, as they were much less likely to accept exposed liars' offers in round 3 (M acceptance = 36%; SD = 50%) than were those who never learned they were lied to (M acceptance = 79%, SD = 43%). (For comparison, the mean acceptance rate for those who were never lied to was 84%.) Table 4 shows the relative size of the offers in round 3, the percentage that were accepted, and

TABLE 4

Round 3 Offers and Their Likelihood of Acceptance as a Function of Information about the Size of the Pie, Revelation, and Whether the Proposer Had Been Deceptive on Rounds 1 or 2

	Proposer was deceptive on rounds 1 or 2?					
	Yes			No		
Knowledge of the size of the pie	% Offered (SD)	Acceptance likelihood	*n*	% Offered (SD)	Acceptance likelihood	*n*
Not known and not revealed	45.1% (14%)	.81	14	44.5% (11%)	.82	19
Not known and revealed	50.0% (11%)	.36	11	47.2% (10%)	.77	30

responders' outcomes as a function of whether information about the size of the pie had been revealed and whether the proposer had been deceptive. Analysis of the proportion of acceptances led to main effects for lying ($F(1,70) = 3.82$, $p < .05$) and for revelation ($F(1, 70) = 5.69$, $p < .05$) and the interaction between the two was marginally significant ($F(1, 70) = 3.42$, $p = .07$). The lowest acceptance rate was in round 3 when proposers had been deceptive in rounds 1 or 2 and this deception was revealed. A comparable analysis of the relative size of the offers responders received in these four conditions showed no significant effects. Thus, the increase in rejections following revelation of the size of the pie cannot be attributed to proposers offering less. Instead, it appears to have resulted from responders' retribution upon proposers who had been deceptive.

The revelation of proposer lies had distinctly different effects on proposers' and responders' behavior. Proposers whose lies were exposed neither increased their offers nor made more apologies, although either (or both) of these strategies might have been effective. Larger offers might have increased responders' acceptances as previous research (e.g., Elsbach, 1994; Bottom et al., 1999), suggests that apologies are at least partially effective in reestablishing cooperative interactions. Responders, in contrast, were clearly affected by the revelation of proposers' lies. In fact, the retribution they enacted by rejecting offers not only hurt proposers, but also hurt responders themselves. Analysis of their outcomes indicated that responders who learned of proposer deception earned significantly less in round 3 ($M = \$6.45$; $SD = \$3.67$) than those who never learned about proposers' lies ($M = \$11.05$;$SD = \$3.89$), $F(1, 24) = 9.12$, $p < .01$.

Deceit and Evaluation Hypotheses

Participants responded to surveys after rounds 2 and 4. Some of the items measured their perceptions of the other person. The perceptions for the two surveys were highly correlated and were not significantly different from one another on any of the items of interest. Thus, to test the deceit and evaluation hypotheses, we combined and averaged negotiators' responses to these items and analyzed the data as a function of deception and negotiator role. That is,

TABLE 5

Proposers' Evaluation of Responders as a Function of Responder Deception and Responders' Evaluation of Proposers as a Function of Proposer Deception.

	Proposer ratings of responders who		Responder ratings of proposers who	
Variable	Deceived (n = 36)	Didn't deceive (n = 68)	Deceived (n = 24)	Didn't deceive (n = 79)
Cooperative	6.76[a]	6.82[a]	5.91[a]	6.49[a]
Competitive	5.35[a]	4.99[a]	5.58[a]	4.93[a]
Trustworthy	5.65[a]	6.58[b]	5.39[a]	6.18[a]
Believed	4.96[a]	6.52[b]	4.83[a]	6.10[b]
Future interaction	5.39[a]	6.75[b]	4.88[a]	6.10[b]

Note. Within rows and categories, means with different superscripts differed from one another at the $p < .05$ level.

we examined the effects of proposer deception on responders' evaluations of proposers and the effects of responder deception on proposers' evaluations of responders, in two separate multivariate ANOVAs.

The MANOVA on proposers' evaluations of responders and their lies was significant ($F(5, 98) = 6.49$, $p < .0001$). Univariate tests were significant for trustworthiness ($F(1, 102) = 4.58$, $p < .05$), believability ($F(1, 102) = 15.08$, $p < .0001$), and desire for future interaction ($F(1, 102) = 13.05$, $p < .0001$), but not for ratings of cooperativeness or competitiveness (p's $> .10$). The MANOVA on responders' evaluations of proposers and their lies was marginally significant ($F(5, 97) = 2.20$, $p = .06$). Univariate tests were significant for believability ($F(1, 101) = 30.31$, $p < .0001$) and desire for future interaction ($F(1, 101) = 29.59$, $p < .0001$), but not for trustworthiness, cooperativeness, or competitiveness (p's $> .10$). The means are shown in Table 5.

Hypothesis 9, that those who have been deceived will view their counterpart as less trustworthy, less believable, and less desirable counterparts in the future than those who have not been deceived was completely supported for proposers. It was supported for responders with the exception of trustworthiness which was in the expected direction, but not statistically significant.

Hypothesis 10, that deception would affect evaluations of cooperativeness and competitiveness, was not supported for either proposers or responders. It appears that being deceived has its biggest effect on attributions of truthfulness (obviously) and on diminishing desires for future interaction with untruthful others, but not on attributions of their cooperative or competitive nature.

Other Relationships

A correlation matrix (see Table 6) shows the overall relationship between acceptance likelihood, offer percentages, survey items, and variables coded from the transcripts, averaged across rounds and surveys. Not surprisingly, acceptances were positively correlated with offer size, satisfaction with the

TABLE 6

Correlations between Likelihood of Acceptance, Percentage Offered, Coded Transcript Variables, and Survey Variables

Variable	Mean	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Acceptance	0.87	0.19	—															
2 Percent offered	0.45	0.07	0.34	—														
3 **Satisfaction/outcome**	**6.11**	**1.47**	**0.51**	**0.23**	**—**													
4 **Satisfaction/processcm**	**6.18**	**1.78**	**0.45**	**0.24**	**0.67**	**—**												
5 **Cooperative other**	**6.51**	**1.91**	**0.69**	**0.34**	**0.59**	**0.69**	**—**											
6 **Competitive other**	**5.14**	**2.02**	**−0.03**	**−0.22**	**0.35**	**0.27**	**−0.44**	**—**										
7 **Trustworthy other**	**5.99**	**1.98**	**0.41**	**0.28**	**0.49**	**0.57**	**0.68**	**−0.45**	**—**									
8 **Future interaction?**	**6.13**	**2.14**	**0.48**	**0.29**	**0.54**	**0.59**	**0.72**	**−0.49**	**0.71**	**—**								
9 **Believed told truth**	**5.83**	**2.01**	**0.33**	**0.25**	**0.38**	**0.63**	**0.58**	**−0.35**	**0.73**	**0.5**	**—**							
10 *Responder request*	*1.59*	*0.91*	*0.09*	*0.09*	*−0.02*	*0.03*	*0.01*	*0.08*	*−0.08*	*0.01*	*−0.1*	—						
11 *Responder threats*	*0.75*	*0.48*	*−0.16*	*0.04*	*−0.17*	*−0.21*	*−0.3*	*0.27*	*−0.25*	*−0.22*	*−0.28*	*0.57*	—					
12 *Responder doubts*	*0.06*	*0.11*	*0.01*	*−0.17*	*−0.02*	*−0.09*	*0.01*	*0.01*	*−0.09*	*−0.02*	*−0.12*	*−0.01*	*0.08*	—				
13 *Responder lies*	*0.19*	*0.29*	*0.01*	*−0.22*	*−0.23*	*−0.36*	*−0.2*	*0.01*	*−0.23*	*−0.3*	*−0.26*	*0.05*	*0.17*	*−0.07*	—			
14 *Proposer lies*	*0.13*	*0.48*	*−0.13*	*−0.14*	*−0.08*	*−0.18*	*−0.17*	*0.01*	*−0.27*	*−0.16*	*−0.22*	*−0.07*	*0.25*	*0.41*	*0.2*	—		
15 *Proposer words*	*24.45*	*12.89*	*−0.02*	*−0.13*	*0.05*	*0.01*	*0.01*	*0.05*	*−0.01*	*0.02*	*−0.04*	*0.06*	*0.06*	*0.25*	*−0.13*	*0.16*	—	
16 *Responder words*	*36.79*	*20.16*	*0.01*	*−0.02*	*−0.02*	*−0.05*	*0.02*	*0.02*	*−0.03*	*0.02*	*−0.01*	*0.16*	*0.19*	*0.31*	*0.12*	*0.1*	*0.54*	—

Note. $n = 220$. Survey variables are shown in bold, coded transcript variables are shown in italics. Correlations between .15 to .17 are significant at the $p < .05$ level, correlations above .18 are significant at the $p < .01$ level. Correlations are based on mean values, collapsed across roles for each variable, averaging across all four negotiations and both surveys.

outcome and process,[3] attributions of the other's cooperativeness, truthfulness, and trustworthiness, and the desire for future interaction. Acceptances were negatively correlated with responder threats.

Offer sizes were positively related to all of the survey items except the belief that the other was competitive. The survey items were positively correlated with each other except for the negatively related ratings of competitiveness.

Responders' doubts were correlated with proposers' deceptions, suggesting that responders were often correct in their suspicions about potential deceit. Responder threats and lies were associated with less satisfaction with the negotiation process and outcome and more negative feelings about the other party being cooperative, trustworthy, truthful, or desiring future interaction. Proposer lies were also negatively associated with satisfaction with the outcome, ratings of cooperativeness, trustworthiness, desiring future interaction, and truthfulness. Thus, tactics that are called contentious in the negotiation literature (threats and lies) were associated with negative feelings toward the process, the outcome, and the other person.

Finally, in terms of verbosity, the data suggest that responders used more words to make demands, threats, or to express doubts about proposers' honesty. Proposers, in contrast, used more words to deceive. The more negotiators communicated with one another, the more they were threatening and deceptive. In addition, negotiators reciprocated verbosity: when responders were wordy, so were proposers.

DISCUSSION

The goal of this paper was to investigate the dynamics of deception and retribution in repeated bargaining interactions. We first examined the impact of negotiators' knowledge (or lack thereof) of their counterparts' private information (pie or outside option amounts) on negotiation offers and outcomes. The results show that when the pie was largest, proposers offered significantly less to responders who did not know the size of the pie than they did to responders who did know its size. Thus, proposers exploited responders' lack of knowledge only when the stakes were high. Proposers also offered less when they knew the value of the responders' outside options than when they did not. These results clarify the conditions under which proposers' strategically exploit responders' lack of information (Pillutla & Murnighan, 1995). They also

[3] Payoffs received did affect ratings of satisfaction with the outcome and the process. By a random toss of the die, 61 dyads received the larger of the two pies ($47) and 49 dyads received the smaller ($27) after the first two rounds; 90 dyads received the smaller of the two pies ($13) and 20 dyads received the larger ($25) after the last two rounds. A MANOVA showed that satisfaction with the outcome ($F(1, 162) = 10.76$, $p < .001$) and with the process ($F(1, 162) = 3.95$, $p < .05$) was significantly influenced by the first payoff. The second payoff had a marginal effect only on satisfaction with the outcome ($F(1, 153) = 1.14$, $p = .06$). The selection of the payoffs had no effects on any of the other variables (cooperativeness, competitiveness, trustworthiness, future interaction, believability, fairness requests, threats, proposer or responder lies, actual offers, or acceptances).

expand the domain of proposers' strategies to include their use of information about responders' options. In general, these data highlight the importance of protecting one's own and obtaining others' private information in negotiations (Murnighan et al., 2000).

Next we examined the impact of knowledge (or its absence) on negotiation behavior, i.e., deception, threats, and doubts. Responders who knew that proposers were uninformed about their outside options did not make stronger threats or more specific requests but they were more deceptive. Proposers were also more deceptive when they knew that responders were similarly uninformed.

We also explored the effects of having private information on negotiators' doubts of the other sides' claims. This hypothesis suggested that participants who themselves had an opportunity to lie would be more suspicious of their counterparts than those without such an opportunity. Our data did not support this prediction. Rather, we found a more basic pattern; responders were more doubtful of proposers' claims when they themselves were uninformed, that is, when they knew that they might be at a disadvantage. These findings might suggest that opportunities to be deceptive were often taken and, in logical conjunction, those who were subject to deception were often doubtful. The data actually show, however, that deception and the expression of doubt were relatively infrequent and that deception was more frequent than doubt.

Contrary to Hypothesis 5, responders did not make stronger threats when they knew that proposers had no knowledge of the size of the outside option. Perhaps this occurred because the range and possible maximum amount of the outside option, relative to the pie size, was so small that responders felt limited in their ability to use threats effectively. Instead we found that responders may have had no need to threaten when proposers did not know the value of their outside options; the uncertainty itself seemed to be enough to induce proposers to offer more.

Responders' knowledge of the size of the pie, however, did have an effect on their willingness to threaten. Informed responders were significantly more likely to make threats than uninformed responders. They also made more specific requests; that is, they were more likely to ask for an actual dollar amount rather than just asking the proposer to be fair or suggesting some proportion be allocated to them, than were uninformed responders. These findings suggest that responders were hesitant to threaten or make strong demands when they were uncertain, both in terms of information and in their ability to predict how proposers would respond. When everyone knew the size of the pie, however, asking for or demanding a specific amount and threatening to reject was a frequent tactic. This behavior suggests that responders' perceptions of proposers' power diminished when responders were informed; knowing the size of the pie allowed them to be more aggressive, even though the underlying structure of their position had not changed.

Responders who discovered that their proposers were deceptive were also significantly more likely to enact retribution by rejecting subsequent offers than responders who had been similarly deceived but did not know it, even

though both were offered similar amounts. Catching a proposer in a lie turned out to be a double-edged sword for responders; they punished liars by rejecting but, as a result, earned less for themselves than did responders who never knew they were lied to.

Proposers and responders who were deceived (even if this deceit was not revealed) rated their counterparts as less truthful and expressed a diminished desire to interact with them in the future, than did those who were not deceived. Proposers also evaluated deceptive responders as less trustworthy. Deception had no effects, however, on proposers' or responders' evaluations of their counterparts' cooperative or competitive behavior.

Finally, the tendency to use contentious tactics, such as threats and lies, was highly associated with negotiator dissatisfaction with outcomes, process, and feelings about the negotiation partner. Positive outcomes were more likely to be related to beliefs that the other was cooperative, trustworthy, and a desirable future negotiation partner. In other words, participants' emotional reactions were quite logical. Also, to the extent that negotiators communicated with one another, those communications apparently were to threaten, deceive, and express doubt. These findings, however, are correlational.

CONCLUSIONS

The variation of known and unknown information about resources and outside options, the presence or absence of revelation of these quantities when unknown, and the changing payoffs over repeated negotiations made this a complex but rich experiment. The opportunity to track the participants' messages enriched it further. Although the quality and range of these interactions was necessarily limited by the nature of the study, these data still capture many of the fundamental aspects of interactions that occur between payoff-oriented negotiators and have much to say about the flow of repeated negotiations.

From a theoretical point of view, the bargainers were little like those depicted by rational economic models. They offered too much, they rejected offers that they should have accepted, and emotions rather than simple profits seemed to have important effects on their behavior. Many of these conclusions have already been documented in one-shot negotiations. The fact that they also occur when negotiators interact with one another repeatedly, albeit anonymously, expands the applicability of these findings.

Had responders known that they would be responders throughout the study, they may have rationally rejected early offers to establish a reputation for toughness, in hopes of increasing the size of later offers. Lack of knowledge about their subsequent responder roles, the value of upcoming pies, and the number of upcoming negotiations, however, mitigates the explanation that all rejections in this experiment occurred only for reputational reasons, especially in later rounds. Regardless of the reason for rejections, additional earnings from later bargaining rounds never compensated responders for the cost of their early rejections.

Inspection of the negotiation transcripts, particularly the threats and deceptions, provides additional data on the dynamics of these interactions. Responders demanded more when they knew the size of the pie and when they knew that proposers had previously deceived them. These results demonstrate how a relatively weaker party can gain clout in negotiations. When the conditions are right, responders can exert even more power in demanding outcomes (in the last round, sometimes greater than 50% of the pie) than proposers. When these findings are compared to previous research on ultimatum games, which showed responders' outcomes increasing primarily due to the risk aversion of proposers rather than to anything they could do for themselves, this effect is particularly striking.

We also acknowledge the limitations of this research. Bargainers, for example, may differ in their propensity to demand, threaten, lie, and punish as a function of individual differences in social motives, i.e., their tendencies to be egoistic (individualistic), cooperative (prosocial), or competitive (Messick & McClintock, 1968). De Dreu and Boles (1998), for example, found that competitors are more likely to endorse and recall negotiation strategies and tactics that focus on winning at the expense of the other than are cooperators, who recall and endorse egalitarian rules and norms. Cooperators also tend to evaluate negotiation tactics in terms of their morality (right versus wrong) whereas individualists view them from the perspective of might (power) (Liebrand, Jansen, Rijken, & Suhre, 1986). In the current study, individualists, who focus only on their own outcome, may have been less likely to enact retribution on dishonest others (because it leads to worse outcomes for self) than competitors, who focus on relative differences in outcomes (and are often willing to accept less for themselves to deprive others). Cooperators, in contrast, may have been unwilling to lie regardless of the opportunity to do so. The variations in propensity to threaten, deceive, and punish observed here, then, might be due to the bargainers' social motives. This is clearly a fruitful topic for future research.

Another limitation of this research was that all of the messages were relatively brief and computer-mediated. The control that this procedure provided allowed us to examine the unique effects of private information on negotiator deception, the effects of learning about such deception, and how negotiator strategies evolved as a function of learning or not learning about prior deception. But because the ultimatum game is an abbreviation of more complicated negotiations, further research on deception in more naturalistic contexts would be particularly beneficial.

In an immediate sense, however, this experimental setting may be an analog to interactions on the Internet, particularly bargaining and auctions between anonymous parties who guard against potential exploitation and learn who to avoid and how they can build trust and cooperation in repeated encounters. At least one on-line auction house gives bidders and sellers each other's e-mail addresses so that they can exchange information about intentions. Moreover, the site provides ratings from those who have had prior interactions with bidders and sellers to bolster (or inhibit) trust or confidence in otherwise anonymous others. When bidders have evidence that other bidders or sellers may be untrustworthy, they can gain retribution by posting negative comments to

warn others about an individual's prior behavior. Thus, the possibility of a marred reputation can loom large, making it common for buyers and sellers to mention this possibility in their interactions (Croson & Glick, 2000).

Both practically and theoretically, the current findings provide an important lens into the process of repeated negotiations. The data show that people are dynamically strategic but not completely so. They take advantage of private information possibilities. These effects are far from mechanical, as the data suggest that the interplay of interpersonal interactions is potent. Responders may react emotionally and reject profitable offers in the present when they realize that they have been deceived in the past. Thus, in addition to the interplay of positional power, repeated interaction, and strategic interventions, we observed a rich undercurrent of emotional force, which practicing negotiators readily acknowledge but which research has only begun to investigate. The implications of the current study suggest that future research on emotions in contentious, uncertain negotiations is particularly critical.

These data also attest to the effects of greed, competition, power, and injustice, and they provide considerable support for both Lewicki et al. (1994) and Murnighan's (1991) perspectives on deception in negotiation. Although we might take solace in the fact that deceptive tactics were used less than one time in every seven opportunities, deception by proposers (who had a large latitude with which to deceive) was more potent and direct (i.e., they were more likely to outright lie) than it was by responders (whose latitude for deception was much smaller) and it surfaced more frequently when the stakes were highest. Although understandable theoretically, this behavior nevertheless was not well received by responders, who increased their rejections after the deception, and the injustice it may have engendered, had been revealed. This behavior occurred even though proposers were still in a structurally powerful position. Clearly, the ironies within these interactions abound.

This study, then, provides a view of the circuitous processes of repeated negotiations, revealing the dynamic interplay of strategizing, deception, detection, and retribution. It provides a window into the drama of repeated, high stakes negotiations that appears to run counter to rational expectations of economic theory and instead typifies the myopic focus of ordinary, self-interested individuals. It also provides optimism by documenting the fact that, even in anonymous, computer-mediated interactions for high stakes, most people did not choose deceptive strategies.

APPENDIX I

Equilibrium Analysis

Equilibrium analysis of these games suggests that, when the responder's outside option is known, proposers should offer responders their outside option, **x**, plus a small amount epsilon.

When **x** is uncertain, however, and uniformly distributed between 0 and $8, and when responders accept all offers strictly above their outside option, the

probability that an offer of $\$Y$ will be accepted is simply $Y/8$ (the probability that the responder's outside option is strictly less than a given offer Y). Thus the proposer's expected profit from an offer Y with a pie of size P is:

$$(P - Y) \times Y/8 + (1 - Y/8)0 \quad (1)$$

To maximize expected profit (proposers are assumed to be risk-neutral), proposers should maximize the above expression, subject to the constraint that the probability of acceptance cannot exceed one ($Y/8 \leq 1$). Taking the first derivative of Eq. 1 and setting it equal to zero, we get $P/8 - 2Y/8 = 0$ and $Y = P/2$. Thus, the subgame perfect equilibrium of this game is an offer of either half the pie or the highest possible outside option, whichever is smaller. For this experiment, then, equilibrium offers are \$6.50 when $P = \$13$ and \$8 for all other pie sizes.

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