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THE INFORMATION DILEMMA IN NEGOTIATIONS: EFFECTS OF EXPERIENCE, INCENTIVES, AND INTEGRATIVE POTENTIAL

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This paper investigates the information dilemma in negotiations: if negotiators reveal information about their priorities and preferences, more efficient agreements may be reached but the shared information may be used strategically by the other negotiator, to the revealers' disadvantage. We present a theoretical model that focuses on the characteristics of the negotiators, the structure of the negotiation, and the available incentives; it predicts that experienced negotiators will outperform naive negotiators on distributive (competitive) tasks, especially when they have information about their counterpart's preferences and the incentives are high—unless the task is primarily integrative, in which case information will contribute to the negotiators maximizing joint gain. Two experiments (one small, one large) showed that the revelation of one's preferences was costly and that experienced nego-

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tiators outperformed their naive counterparts by a wide margin, particularly when the task and issues were distributive and incentives were large. Our results help to identify the underlying dynamics of the information dilemma and lead to a discussion of the connections between information and social dilemmas and the potential for avoiding inefficiencies.

One of the most well accepted truths in negotiation is that sharing information increases the likelihood and the quality of negotiated agreements. Years ago, Walton and McKersie (1965) noted that parties who share information on their preferences facilitate the process of negotiation. In classic and recent studies, many other researchers have also suggested that sharing information on preferences and priorities improves the quality of negotiated outcomes (Daniels, 1967; Raiffa, 1982; Lax & Sebenius, 1986; Neale & Bazerman, 1991; Pruitt & Carnevale, 1993; Pruitt & Rubin, 1986; Thompson, 1991).

In most negotiations, bargainers' interests are not completely opposed (Pruitt & Rubin, 1986; Neale & Bazerman, 1991; Murnighan, 1991); instead, they share some degree of correspondence or compatibility. In an employment negotiation, for example, if employees want long vacations and employers want to limit the costs of medical coverage, they can boost their individual and their joint gains by trading off their less valued outcomes for their more valued outcomes, that is, for longer vacations and less costly health coverage. If they share preference information, we might expect that they would achieve a mutually beneficial agreement more easily than if they do not. This is the essence of integrative bargaining.

Potential difficulties come with the fact that revealing one's preferences may involve considerable risk. In doing so, negotiators provide their counterparts with a competitive advantage: informed bargainers can suggest tradeoffs that serve their own interests more than their counterparts'. In other words, while sharing information may contribute to increased outcomes, it may also allow the other party to claim most of them. Thus, negotiators face an information dilemma: they can reveal information about their preferences to increase the likelihood and the quality of their joint outcome, but in so doing they may threaten their own share of that outcome. If, knowing this, they guard their preferences, reaching an agreement is likely to be more difficult and less likely, as is achieving the maximum joint gain.

The information dilemma is analogous to the classic prisoners' dilemma (Luce & Raiffa, 1957) and can be framed as a basic coordination problem: both parties prefer to maximize joint outcomes, but they fear losing individual gain by being either the first to reveal their preferences or by revealing more of their preferences than their counterparts do. As a result, bargainers may conceal their preferences, leading to an inefficient joint outcome that neither prefers. The dilemma is compelling because, while sharing information depends on each negotiator trusting the other negotiator to fully reciprocate, if one party reveals (cooperates), the other's best response is to conceal (noncooperate). This paper presents a model of the information dilemma and two experiments that test its predictions.

A Model of the Information Dilemma

The underlying assumptions of the information dilemma in negotiations are that revealing one's preferences leads to better joint outcomes but risks an unfavorable allocation of resources, resulting in worse outcomes for the revealer. We consider both effects in turn.

Joint Gain

Few interactions are strictly competitive or zero-sum (Rapoport, 1966); most involve the possibility of increasing (or decreasing) joint outcomes. Early research by Siegel and Fouraker (1960) found that shared information increased the likelihood that bargainers would reach an agreement that maximized their joint outcome. Daniels (1967) noted that "transmission of almost any kind of information was helpful" (p. 47). Pruitt and Lewis (1975) found that naturally occurring information exchange was associated with higher joint profits.

Thompson (1991) examined the causal relationship between information exchange and outcomes by instructing randomly selected negotiators to either provide information about their priorities to their counterparts or seek information about the other's priorities; their counterparts received no special instructions to either provide or seek information. Overall, pairs that included either an information-providing or an information-seeking negotiator achieved more integrative agreements than pairs in which neither party provided nor sought information. The incidence of spontaneous information exchange, however, was remarkably low: in a control condition with no instructions to provide or seek information, only 7% of the negotiators provided information about their interests and only 20% sought this information from the other party. This suggests that negotiators either did not appreciate the value of exchanging information or they feared that revealing information would be used opportunistically against them.

Opportunistic Behavior

Opportunism involves the strategic use of information to further one's interests at the expense of another party. Opportunistic behavior may follow the revelation of information by one party, especially if information receivers do not reciprocate (Gouldner, 1960) and provide information about their own preferences. Both economic (e.g., Milgrom & Roberts, 1987) and organizational theory (e.g., Pfeffer & Salancik, 1978) suggest that relevant information conveys power, providing information holders with the foundation for achieving greater outcomes than the less well informed. In particular, knowing another's preferences allows a negotiator to use this information strategically and negotiate a greater share of the outcome. Roth and Murnighan (1982) documented this effect empirically in a distributive bargaining task, showing that information was particularly valuable to bargainers who had relatively poor outcome opportunities and who might, as a result, be expected to bargain more strategically (e.g., Murnighan & Pillutla, 1995).

In contrast, Thompson (1991) found no apparent evidence for opportunistic behavior: negotiators who were instructed to reveal or seek information achieved

outcomes that were not significantly different from their counterparts. Joint gains increased without leading to any significant disadvantage for information disclosers.

These conflicting findings lead to several critical questions, including when negotiators will reveal their preferences, when (or if) their counterparts will use this information to the discloser's disadvantage, and whether such revelations actually do lead to increases in joint gain but reduced individual gain for revealers. In the process of formulating a model to address these issues, we tried to incorporate some of the essential elements of most negotiation contexts. As a result, we focused on the negotiation's underlying structure (i.e., the negotiation's cooperative or competitive nature, the strategies that are possible, etc.), key characteristics of the actors, and the context surrounding their negotiation.

Negotiation structures can range from the very simple (i.e., single issues, well understood) to the very complex (i.e., multiple issues, incomplete information, etc.). When negotiators with conflicting preferences must negotiate a single issue, the negotiation can be quite competitive with both parties realizing that a concession, on either positions or preferences, might cost them some of the outcome. When negotiators with conflicting preferences must negotiate multiple issues, the task itself is likely to include a mix of distributive (competitive) and integrative (potentially cooperative) issues. Because we wanted to investigate a range of more than simple negotiations, we included a mix of integrative and distributive issues in our research tasks. Conceptually, we focused on whether a negotiation was primarily integrative or primarily distributive (Walton & McKersie, 1965).[1] When negotiators weigh issues identically and have diametrically opposed preferences, their task is completely distributive. They are likely to negotiate everything competitively. Although this circumstance is rare, many people assume that their negotiations are more competitively structured than they are. They suffer from the "fixed pie bias" (Thompson & Hastie, 1990). In an objective sense, any negotiation task that departs from this competitive extreme allows for the possibility of increasing the parties' joint gains through integrative bargaining.

At the opposite extreme are completely cooperative negotiations, when negotiators weigh issues identically and have identical preferences on each issue. With multiple issues, this circumstance is also rare. Any departure from this cooperative extreme allows for the possibility of increasing one's gains through distributive bargaining.

Most negotiations fall between these two extremes. To understand the range of possibilities (without looking at many, many different negotiation structures), we focused on negotiation structures that approach the extremes. Primarily integrative negotiations approach the completely cooperative extreme. They provide negotiators with the opportunity to expand their joint outcomes if they work

[1]We eliminated strictly cooperative negotiations because they do not pose an information dilemma: once the structure is understood, the dilemma no longer exists.

together well. Should they not work together well, their joint (and individual outcomes) can be much smaller. Primarily distributive negotiations approach the completely competitive extreme. They offer much less opportunity for expanding the parties' joint outcomes; they reward competitive tactics.

Alongside a negotiation's structure are the actors and their motivations. For actors, we focused on *experience* as a critical strategic advantage. Experienced negotiators should have more strategies at their disposal, they should be more adept at using them, and they should adjust more easily to differences in negotiation structures than naïve negotiators.

Actors and their negotiations are embedded within a negotiation context. We focused here on the negotiation's incentives. We assume that large financial incentives activate less cooperative motivations (e.g., greed) and encourage negotiators to be competitive. Small financial incentives, in contrast, allow negotiators to deemphasize their tangible outcomes and focus on social outcomes. When financial consequences are minimal, people can afford to be fair. For instance, Shapiro (1975) suggested that, as payoffs increase, equal outcomes become less likely, and self-interested allocations become more probable. Other models make similar assumptions (e.g., Komorita & Chertkoff, 1973; Van Avermaet, McClintock, & Moskowitz, 1978).

The three central elements of our model, then, are the negotiator's experience, the integrative or distributive nature of the negotiation, and the available incentives. We address each of these concepts in turn.

Experience

The ability to use information effectively may depend on the skills a negotiator has accumulated with experience. Inexperienced negotiators, for instance, are not likely to be able to implement sophisticated, opportunistic strategies (e.g., Murnighan, 1981). Experience and training can lead to dramatic improvements in individual and joint performance and in the ability to judge others' priorities and preferences and capitalize on integrative issues (Thompson, 1990, 1991). In market simulation studies, where negotiators completed several transactions, more efficient outcomes were reached as negotiators gained experience with the task (Bazerman, Magliozzi, & Neale, 1985; Neale & Northcraft, 1987).

Thompson's (1990) study of experienced versus naive bargainers also showed that experience not only increased the likelihood of integrative, mutually beneficial outcomes, but that negotiators increased their outcomes with experience. For instance, experienced negotiators learned how to make strategic use of compatible issues (those where the parties' preferences were identical). By feigning opposite preferences when their preferences were actually identical to their opponent's, experienced negotiators could pretend that they were making painful concessions in exchange for gains when they were actually improving their own outcomes on two issues simultaneously. O'Connor and Carnevale (1997) also found that negotiators used information about compatible issues strategically to boost their own profits; they distinguished between active misrepresentation (purposefully mis-

leading an opponent) and passive misrepresentation (failing to correct an opponent who makes a faulty assumption).

At a minimum, experienced negotiators should outperform naive negotiators. (Previous work has already documented this effect, although not always convincingly. We include it here as a preliminary, necessary initial test.) Giving experienced bargainers information about a naive partner's preferences should allow them to do even better by giving them an opportunity to be more opportunistic and use the compatible issues strategically to increase their own outcomes.[2]

Hypothesis 1: Experienced negotiators will obtain higher outcomes than naïve negotiators.

Hypothesis 1a: The advantages of experience will be enhanced when experienced negotiators have information about their counterpart's preferences.

Negotiation Structure

As conceptualized above, primarily integrative negotiations offer less potential for individual outcomes from competition and considerable potential for achieving joint gains, possibly by sharing preference information. In primarily integrative negotiations, individual gain results from maximizing and sharing joint gains rather than from competitive action. As negotiations become more distributive, the reverse is true: the potential for individual outcomes from competition increases and the potential for achieving joint gains diminishes. Individual gain comes from competitive action.

In the first of the two experiments we report here, the bargainers negotiated three issues (see Table 1). In the primarily distributive task the bargainers valued all of the issues identically but their preferences were diametrically opposed for two of the three. In the primarily integrative task the negotiators had different valuations for these two issues. This allowed them to integrate their different preferences, i.e., they could trade concessions on these two issues to obtain the maximum on their most preferred issue in exchange for the minimum on their least preferred issue. In both tasks, the third issue was compatible, i.e., their preferences and valuations were identical. This issue was of moderate value compared to the other two.

[2]In the experiment we report below, we did not give information about the experienced bargainers' preferences to the naïve bargainers for two reasons: (1) to keep the experiment to a manageable size and (2) because we expected that they would not be able to use it effectively. We hope that future research will actually test this expectation.

Table 1
Payoff Tables for the Two Tasks in the First Study

A. Primarily Distributive Task

Plan	Issues: Guarantee Points for You	Guarantee Points for (other)	Delivery Date	Delivery Points for You	Delivery Points for (other)	Design Style	Design Points for You	Design Points for (other)
A	16,000	(000)	1st	4000	(000)	1	10,000	(10,000)
B	14,000	(2,000)	3rd	3500	(500)	2	8,750	(8,750)
C	12,000	(4,000)	5th	3000	(1000)	3	7,500	(7,500)
D	10,000	(6,000)	7th	2500	(1500)	4	6,250	(6,250)
E	8,000	(8,000)	9th	2000	(2000)	5	5,000	(5,000)
F	6,000	(10,000)	11th	1500	(2500)	6	3,750	(3,750)
G	4,000	(12,000)	13th	1000	(3000)	7	2,500	(2,500)
H	2,000	(14,000)	15th	500	(3500)	8	1,250	(1,250)
I	000	(16,000)	17th	000	(4000)	9	000	(000)

B. Primarily Integrative Task

Number	Issues: # of Sidetrips Points for You	# of Sidetrips Points for (other)	Departure Date	Departure Points for You	Departure Points for (other)	Hourly Charge	Hourly Points for You	Hourly Points for (other)
10	12,000	(000)	1st	8000	(8000)	$5	4,000	(000)
9	10,500	(500)	3rd	7000	(7000)	$6	3,500	(1,500)
8	9,000	(1,000)	5th	6000	(6000)	$7	3,000	(3,000)
7	7,500	(1,500)	7th	5000	(5000)	$8	2,500	(4,500)
6	6,000	(2,000)	9th	4000	(4000)	$9	2,000	(6,000)
5	4,500	(2,500)	11th	3000	(3000)	$10	1,500	(7,500)
4	3,000	(3,000)	13th	2000	(2000)	$11	1,000	(9,000)
3	1,500	(3,500)	15th	1000	(1000)	$12	500	(10,500)
2	000	(4,000)	17th	000	(000)	$13	000	(12,000)

In Experiment 2, a more complex negotiation task included six issues (two distributive, two integrative, and two compatible; see Table 2). In the primarily

distributive task, the most important issue was distributive, the integrative issues were not particularly valuable, and the potential gains from completely integrating were minimal (100 points more than a straight compromise on the integrative issues). In the primarily integrative task, the most important issue was integrative, the distributive issues were not particularly valuable, and the potential gains from completely integrating were considerable (1800 points more than a straight compromise).

The primarily integrative tasks in both experiments were close to the completely cooperative extreme, and the primarily distributive tasks were close to the completely competitive extreme. We assumed that competitive, hard-nosed bargaining would be more effective than cooperative, problem-solving tactics in both of the primarily distributive tasks and that the reverse would be true for the primarily integrative tasks. Clearly, the two sets of tasks are different in many ways. We used the simpler task in Experiment 1 as a first look at the potential validity of our model. We used a more complicated task in our larger Experiment 2 in an attempt to represent more complex, naturally occurring negotiations.

The information dilemma model suggests that recognition of these negotiation structures will lead to different strategies, particularly by experienced negotiators. Both of the primarily distributive negotiations should lead experienced negotiators to be more competitive, to focus on the more valuable distributive issues, and to do better than naïve negotiators on those issues. Both of the primarily integrative negotiations should lead experienced negotiators to be more cooperative, to focus more on the more valuable integrative issues, and to maximize joint gains on those issues. These effects should be accentuated when experienced negotiators have information about their counterpart's preferences. In the primarily distributive negotiations, they will be able to use more informed strategies to push agreements that maximize their own individual outcomes. In the primarily integrative negotiations, they will be able to see more easily how to achieve maximum joint gains.[3]

Hypothesis 2: In primarily distributive negotiations experienced negotiators will use competitive, opportunistic strategies to boost their individual outcomes, primarily on the distributive issues.

Hypothesis 3: In primarily integrative negotiations experienced negotiators will use cooperative strategies to increase joint gains.

[3]The model focuses primarily on experienced negotiators. It assumes that naïve negotiators will be less attentive to different negotiation structures. Thus, a strong prediction for naïve negotiators is that different negotiation structures will have no effect on them. This null hypothesis, however, is difficult to test and is not included here.

Table 2
Payoff Tables for Bargainers in the Primarily Integrative and Primarily Distributive Tasks

A. Primarily Integrative Task: City's Planner's Payoffs

Financing	Retail Space	Open Space	Height	Inspector	Subcontractors
$ 500K (4000)	12000ft (2400)	26% (1000)	2stories (800)	Mayer (600)	8 (400)
$ 600K (3500)	10500ft (2100)	24% (875)	3stories (700)	Stevens (525)	7 (350)
$ 700K (3000)	9000ft (1800)	22% (750)	4stories (600)	Burrows (450)	6 (300)
$ 800K (2500)	7500ft (1500)	20% (625)	5stories (500)	Young (375)	5 (250)
$ 900K (2000)	6000ft (1200)	18% (500)	6stories (400)	Conibear (300)	4 (200)
$1000K (1500)	4500ft (900)	16% (375)	7stories (300)	Hawes (225)	3 (150)
$1100K (1000)	3000ft (600)	14% (250)	8stories (200)	Gillespie (150)	2 (100)
$1200K (500)	1500ft (300)	12% (125)	9stories (100)	DeWitt (75)	1 (50)
$1300K (0)	0ft (0)	10% (0)	10stories (0)	Wottle (0)	0 (0)

B. Primary Integrative Task: Development Company's Payoffs

$ 500K (0)	0ft (0)	26% (0)	2stories (0)	Wottle (0)	8 (0)
$ 600K (50)	1500ft (300)	24% (125)	3stories (100)	DeWitt (75)	7 (500)
$ 700K (100)	3000ft (600)	22% (250)	4stories (200)	Gillespie (150)	6 (1000)
$ 800K (150)	4500ft (900)	20% (375)	5stories (300)	Hawes (225)	5 (1500)
$ 900K (200)	6000ft (1200)	18% (500)	6stories (400)	Conibear (300)	4 (2000)
$1000K (250)	7500ft (1500)	16% (625)	7stories (500)	Young (375)	3 (2500)
$1100K (300)	9000ft (1800)	14% (750)	8stories (600)	Burrows (450)	2 (3000)
$1200K (350)	10500ft (2100)	12% (875)	9stories (700)	Stevens (525)	1 (3500)
$1300K (400)	12000ft (2400)	10% (1000)	10stories (800)	Mayer (600)	0 (4000)

C. Primarily Distributive Task: City's Planner's Payoffs

$ 500K (1000)	12000ft (2400)	26% (4000)	2stories (400)	Mayer (600)	8 (800)
$ 600K (875)	10500ft (2100)	24% (3500)	3stories (350)	Stevens (525)	7 (700)
$ 700K (750)	9000ft (1800)	22% (3000)	4stories (300)	Burrows (450)	6 (600)
$ 800K (625)	7500ft (1500)	20% (2500)	5stories (250)	Young (375)	5 (500)
$ 900K (500)	6000ft (1200)	18% (2000)	6stories (200)	Conibear (300)	4 (400)
$1000K (375)	4500ft (900)	16% (1500)	7stories (150)	Hawes (225)	3 (300)
$1100K (250)	3000ft (600)	14% (1000)	8stories (100)	Gillespie (150)	2 (200)
$1200K (125)	1500ft (300)	12% (500)	9stories (50)	DeWitt (75)	1 (100)
$1300K (0)	0ft (0)	10% (0)	10stories (0)	Wottle (0)	0 (0)

D. Primarily Distributive Task: Development Company's Payoffs

$ 500K (0)	0ft (0)	26% (0)	2stories (0)	Wottle (0)	8 (0)
$ 600K (100)	1500ft (300)	24% (500)	3stories (50)	DeWitt (75)	7 (125)
$ 700K (200)	3000ft (600)	22% (1000)	4stories (100)	Gillespie (150)	6 (250)
$ 800K (300)	4500ft (900)	20% (1500)	5stories (150)	Hawes (225)	5 (375)
$ 900K (400)	6000ft (1200)	18% (2000)	6stories (200)	Conibear (300)	4 (500)
$1000K (500)	7500ft (1500)	16% (2500)	7stories (250)	Young (375)	3 (625)
$1100K (600)	9000ft (1800)	14% (3000)	8stories (300)	Burrows (450)	2 (750)
$1200K (700)	10500ft (2100)	12% (3500)	9stories (350)	Stevens (525)	1 (875)
$1300K (800)	12000ft (2400)	10% (4000)	10stories (400)	Mayer (600)	0 (1000)

Note: Points accumulated for each alternative negotiation outcome are in parentheses

Hypothesis 1a is also relevant with respect to Hypotheses 2 and 3: information should accentuate the predicted effects.

Incentives

The rational models that underlie most models of organizational and interpersonal behavior predict that incentives will strongly influence an individual's behavior (e.g., Locke & Latham, 1990; Murnighan, 1991; Roth, 1995). In negotiations, individuals often pursue strategies that they expect will improve their chances for high outcomes (Komorita & Chertkoff, 1973). To do as well as possible in primarily integrative negotiations, prescriptions (e.g., Fisher & Ury, 1981) suggest that the parties should engage in problem solving, collaboration, and cooperation, with both parties pushing to do well and neither subjugating their own individual interests (Huber & Neale, 1987). Daniels (1967), for instance, found that in a negotiation where collaboration could increase individual and joint outcomes, higher incentives generally led to greater joint outcomes. Strictly competitive strategies (e.g., negotiating one issue at a time and conceding as little and as infrequently as possible) may make maximization of joint gain, or even agreement, less likely. Opportunism, then, should be less likely in primarily integrative negotiations. Instead, experienced negotiators are likely to use information about the other party's preferences to ensure the achievement of integrative outcomes, especially when the stakes increase. Similarly, in primarily distributive negotiations, experienced bargainers should be more competitive and more opportunistic when they have information about the other party's preferences, especially as the stakes increase.

Hypothesis 4: Larger incentives will lead experienced negotiators to be more competitive and opportunistic in primarily distributive negotiations.

Hypothesis 5: Larger incentives will lead experienced negotiators to more frequent maximization of joint gain in primarily integrative negotiations.

We expected that each of these factors—experience, the negotiation structure, and incentives—would contribute to determining whether a negotiator would take opportunistic advantage of information about the other party's preferences. In particular, we expected that experience and strong incentives would combine to maximize opportunism when the task was primarily distributive; they would combine to foster strategies to maximize joint gain when the task was primarily integrative.

Hypothesis 6: Experienced negotiators with information about their counterpart's preferences in high stakes, primarily distributive negotiations will be particularly opportunistic and will do extremely well on the distributive issues.

Hypothesis 7: Experienced negotiators with information about their counterpart's preferences in high stakes, primarily integrative negotiations will be particularly successful at maximizing joint gains.

We conducted a preliminary study, Experiment 1, to test some of the basic tenets of the information dilemma model. In particular, we wanted to determine whether having preference information led to better joint outcomes in a primarily integrative task and better individual outcomes for the informationally advantaged bargainers in a primarily distributive task. This study did not manipulate experience, since all participants were experienced negotiators. It also did not manipulate different incentive levels. It did focus on the effects of the distribution of information of one party's preferences on the outcomes that they negotiated in two tasks, one primarily integrative, the other primarily distributive.

Experiment 1

Method

Participants were recruited from MBA negotiation courses at the University of Chicago. Advertisements offered a chance to win a prize of $250, depending on participants' performance in two bargaining tasks. Thirty-four students volunteered; all had experienced a series of negotiation exercises but had not experienced the exercises in this study. Participants were randomly assigned to the role of either buyer or seller, which they kept for both negotiations. Pairs were randomly assigned to one of two information conditions, whether information about the other negotiator's preferences was revealed to one negotiator or not. All of the 17 pairs negotiated a primarily distributive and a primarily integrative task, with the order counterbalanced across pairs. This led to a 2 (information conditions) x 2 (distributive vs. integrative tasks) design, with tasks a repeated measure. Participants were told that a lottery would be used to select one person to win $250. Doing better on either task increased their chances of winning; this should have encouraged them to do as well as they could for each negotiation. Pairs met face-to-face and had 20 minutes to reach each agreement (a time that pretesting had found was more than ample). After each negotiation, participants filled out a final contract specifying the terms if they had agreed.

The Tasks

Each task included three issues with nine possible outcomes for each issue (see Table 1). The primarily distributive task involved the purchase of new machinery. The issues were guarantee and delivery date (distributive issues where their preferences and outcomes were diametrically opposed) and final design (a compatible issue, where their preferences were identical). The primarily integrative task involved the purchase of travel arrangements. Two issues had complementary importance to the negotiators (number of sidetrips and the hourly charge for recreation equipment), one issue was compatible (departure date). They could

maximize their joint outcome if each bargainer obtained the best outcome on their most valuable issue in exchange for the worst outcome on their least valuable issue and also maximized on the compatible issue.

Negotiators who were informed about the other's preferences received a copy of their counterpart's payoff schedule before the negotiation began. They were told that they should study this information carefully prior to the negotiation, to not assume that the other party had the same information about them, and to treat the information as confidential. Informed negotiators were also told that their counterpart was not aware that they had this additional information. Half of the informed negotiations were buyers; the other half were sellers.

Participants were given detailed written materials, including a description of the task, their role, the time constraints, the issues, the alternatives for each issue, the payoffs for each possible outcome, and the value of the cash prize. The last page of the instructions was a quiz to ensure that the participants understood the task and their role. All of the participants responded correctly about their most preferred alternative for each issue, the points they would receive if they did not reach an agreement on all issues (zero), and how the lottery procedure worked.

The outcomes for the distributive and compatible issues were scored from 1 to 9, with 9 for the maximum and 1 for the minimum. Individual scores for the two distributive issues could range from 2 to 18. Outcomes on the integrative issues, which ranged from 0 to 12,000 on one issue and 0 to 4,000 on the other, were summed and divided by 1,000. Maximally integrative and equal solutions would yield each party a score of 12. Joint outcomes that did not maximally integrate were necessarily less, although individual outcomes could exceed 12. Joint performance was calculated by summing both negotiators' scores for the two integrative tasks.

Results

All pairs received the maximum outcome on the compatible issues; unlike less experienced negotiators in other studies (Thompson & Hrebec, 1996), no one missed getting all of the payoffs possible on these issues.

In the eight pairs that had no information about each other's preferences, six agreed to equal outcomes on the integrative and distributive issues. None of these negotiators achieved an outcome advantage, and all maximized their integrative totals. In the other two pairs, buyers did better on both tasks: one buyer outdid the seller 15 to 5 on the distributive task and 10.5 to 8.5 on the integrative; the other outdid the seller 10.5 to 9.5 on the distributive task and 13 to 9 on the integrative. Both achieved better outcomes than the buyers in the equal outcome pairs. Overall, the outcomes for bargainers who received no preference information were either equal or favored buyers, replicating a common finding that reflects a small but consistent outcome advantage for buyers in bilateral negotiations (Neale & Bazerman, 1991).

Of the five buyers who knew the seller's preferences, four achieved equal, maximum joint outcomes on the integrative tasks and better outcomes on the dis-

tributive tasks [totals of 11, 12, 11, and 14.5 (M = 12.1) versus 9, 8, 9, and 5.5 (M = 7.9), respectively]. The fifth buyer obtained an equal distributive outcome and a better outcome on the integrative issues, 13 to 9. Thus, all five buyers who had an informational advantage did better than their counterparts, most often on the distributive task.

Of the four sellers who knew the buyer's preferences, three obtained equal outcomes on both the distributive and the integrative tasks. The fourth seller did better on both tasks, outpointing the seller 10.5 to 9.5 on the distributive task and 12.5 to 10.5 on the integrative. Thus, all of the sellers who had an informational advantage did as well as or better than their counterpart buyers, most often as well.

Receiving information about the counterpart's payoff did not significantly affect their ability to maximize joint outcome on the integrative issues [t (15) = .47, ns], but all pairs did well, with 13 of 17 achieving maximum, equal integrative outcomes. Receiving information did affect the participants' individual outcomes, with informed negotiators obtaining significantly higher outcomes than uninformed negotiators [means of 23.06 vs. 21.68 points; t (8) = 3.47, $p < .01$]. This effect resulted primarily from variation in the outcomes on the distributive issues (see Table 3). These data suggest that an information advantage was converted into better distributive outcomes, especially by informed buyers.

Table 3
Mean Outcomes for Sellers and Buyers in Experiment 1 on the Distributive Issues when They were Informationally Advantaged, Uninformed of Their Counterpart's Preferences, or Informationally Disadvantaged

	Informationally Advantaged	Uninformed	Disadvantaged
Sellers	10.1	9.3	8.3
n	4	8	5
Buyers	11.7	10.7	9.9
n	5	8	4
M	11.0	10.0	9.0
N	9	16	9

Discussion

The results from this small-sample study suggest that information about a counterpart's preferences gives negotiators an advantage. Information about the other side's preferences led to better outcomes for the informed party, especially on the distributive issues, as predicted by our model of the information dilemma.

The excellent performance by the bargaining pairs on the integrative and compatible issues attests to the value of experience, as all of these negotiators were

experienced bargainers. If we guardedly substituted experience for information in our model, then the frequency of the maximum, equal integrative outcomes attests, at least indirectly, to the positive side of the information dilemma.

Thus, these data provide initial support for the underlying logic and expectations of the information dilemma model. In particular, the data suggest that experienced negotiators gained larger individual outcomes in primarily distributive negotiations when they had information about the other's preferences. The data also suggest that these experienced bargainers were quite good at maximizing their joint outcomes in primarily integrative negotiations.

As a next step, then, armed with this preliminary support, we conducted a full-scale experiment to test the model's predictions for the effects of experience, incentives, and the negotiation structure on bargaining outcomes.

Experiment 2

Method

A total of 192 graduate and undergraduate students enrolled in business administration at the University of Illinois voluntarily participated in the experiment. They had been informed that monetary prizes would be paid to some participants.

Participants were seated at computer terminals with experienced negotiators on one side of a partitioned room and naive negotiators on the other. The terminals were networked to allow participants to exchange messages and proposals. They were told not to reveal their identity, as participants were to remain anonymous. (Although this was not enforced on-line, subsequent analysis of the message transcripts revealed no instances of identity revelation.) Bargainers were given 35 minutes to reach agreement. They then completed a "final contract," specifying terms if they reached agreement. To assess the accuracy of their judgments, participants then completed a questionnaire that assessed their perceptions of the values of the issues to their counterparts.

The Task

The negotiation involved a development project with a corporation vice president and a city's chief planner negotiating six issues: two integrative (the financing the city would provide and how many local subcontractors would be used), two distributive (the amount of open space in the project and the height of the buildings), and two compatible (how much retail space would be included and the identity of the building inspector).[4] Each issue could lead to any of nine settlement alternatives; for example, financing ranged from $500,000 to $1,300,000 in increments of $100,000 (see Table 2).

[4]This case was developed by Susan Brodt of Duke University and used with permission.

Participants received detailed written materials that described the task, their role, the time available for negotiating, and the value of the prize one participant would win, one week prior to the actual negotiation. The six issues, the alternatives for each issue, and the points they would receive for each possible settlement were also described. The instructions for the lottery were exactly like those for Experiment 1 except that the prize varied in the two incentive conditions; it was either $20 or $500. The instructions ended with the same quiz as in Experiment 1; all participants again completed these items correctly.

At the end of the term, the lotteries were conducted and the winners were paid. The findings were discussed at length and all of the participants' questions were answered.

Design

Each pair of negotiators was assigned to one of the eight conditions in a 2 x 2 x 2 between-subjects factorial, including *task structure* (primarily integrative or primarily distributive), *incentives* ($20 or $500 cash prizes), and *information* (experienced negotiator informed about naive negotiator's preferences or not). Because all of the pairs included an experienced and a naïve bargainer and because all of the negotiations included three kinds of issues, two additional variables could be analyzed: the negotiator's *experience* (experienced vs. naïve) and the three types of *issues* (distributive, integrative, and compatible).

To manipulate negotiation experience (a difficult task in the context of a laboratory experiment) students received three hours of concentrated training in integrative bargaining in either a negotiation course (the masters' students) or an introductory management course (the undergraduates). The training included a brief introduction to negotiation, participation in two complex negotiation tasks, and extensive discussion and analysis. The first task included one distributive and two integrative issues; the second included two integrative, one compatible, and two distributive issues. The naïve participants came from the same populations of students but did not receive any negotiation training. One experienced and one naïve participant were randomly assigned to form each bargaining pair.

The primarily integrative task included one integrative issue that was 10 times as valuable as another, making the benefits from trading off the two issues considerable, plus two moderately valued distributive issues, with little variation from the best to the worst outcomes. The primarily distributive task included an integrative issue that was 1.25 times as valuable as the other, making the benefits from trading off relatively small. Instead, the distributive issues provided the greatest opportunity for high payoffs.

The information manipulation duplicated that of Study 1, with the information given only to the experienced negotiator (when appropriate). Naïve negotiators never received the experienced negotiator's payoff information and, when the experienced bargainer had information about their preferences, were not told that their counterpart was informed.

Dependent Measures

Performance. Three individual performance scores were calculated by summing outcomes for each negotiator on the two distributive, the two integrative, and the two compatible issues. Overall performance was the total of these three scores. Joint performance was calculated by summing the integrative and the compatible scores for each pair of negotiators.

Judgment Accuracy. To check participants' information, we computed judgment accuracy scores for each participant by examining their perceptions of their counterparts' preferences for the integrative and compatible issues. Specifically, negotiators estimated how important each issue was for the other negotiator. We used Thompson and Hastie's (1990) scoring method: for the integrative issues, accurate weighting of the counterpart's preferences on both issues was scored as +1; beliefs that the two integrative issues were identically weighted were scored as 0; and incorrect beliefs about the other party's weighting of the two issues were scored as -1. Participants who correctly perceived that their counterpart's preferences were identical to their own on the two compatible issues received a score of +1; correct perception of one of the two issues led to a score of 0; and incorrect perceptions of the other's preferences on both issues led to a score of –1.

Deceptions, Truth, and Lies. All messages and proposals were recorded. We constructed three simple measures to examine opportunism and the strategic use of information during the negotiations. Using the compatible issues strategically required deception or lying about one's preferences. Deception was operationally defined as letting the other party assume that your preferences on the compatible issues differed from theirs. This corresponds to O'Connor and Carnevale's (1997) concept of passive misrepresentation. Telling the truth was defined as revealing common preferences. Lying (active misrepresentation) was defined as statements that clearly contradicted a negotiator's actual preferences, i.e., stating that a person preferred less rather than more retail space. Two judges independently rated transcripts from the compatible issues for 20 randomly selected negotiations as truths, lies, or deceptions; one of these judges rated all of the transcripts. The two sets of ratings for the subset of 20 negotiations were identical for 90.7% of the participants' statements. Differences were discussed and resolved; the single rater's final ratings were used in the analyses.

Results

Of the 96 pairs of negotiators, 76 reached agreement (79%). We used a probit model to examine the effects of the manipulations on the likelihood of settlement, finding one significant effect, for tasks [F (1, 89) = 4.86, $p < .05$]: pairs reached more settlements when the negotiation was primarily integrative.[5]

[5]A marginally significant interaction between tasks and incentives [F (1, 89) = 2.90, $p < .10$] indicated that pairs almost always settled (96% of the time) when the negotiation was primarily integrative and incentives were low; the presence of either high incentives or a primarily distributive task led to fewer agreements (ranging from 71 to 76%).

Individual Performance

Two sets of analyses were conducted on the bargainers' outcomes, one on the raw outcomes and the other on the percentage of the possible outcome for each type of issue (distributive, integrative, or compatible). The analyses considered the outcomes received by the two negotiators in a pair and the outcomes for the three issues as repeated measures. Table 4 presents the significant results from the analysis of variance; Table 5 displays many of the means. The data reveal six noteworthy findings: (1) On average, experienced bargainers earned 15% more than their naïve counterparts. This provides clear support for Hypothesis 1, which stated that experienced negotiators would obtain higher outcomes than naïve negotiators. (2) The information variable led to no significant effects. Experienced bargainers did better than naïve bargainers whether they were informed or not. This finding means that Hypothesis 1a, which predicted that preference information would enhance the advantage of experts over naïve bargainers, is not supported. (3) The experience by issues interaction indicates that, compared to naive negotiators, experienced bargainers did well on the distributive rather than the integrative issues. (4) The experience by task interaction indicates that this was especially true for the primarily distributive task. These two findings provide strong support for Hypothesis 2, which stated that experienced negotiators would be competitive in primarily distributive negotiations and would do particularly well on the distributive issues. (5) The experience by task by incentive interaction also depended on variation in outcomes on the distributive issues. The data in Table 5 show that experience did not provide an advantage in the compatible or the integrative issues in the primarily integrative tasks. This means that Hypothesis 3, which stated that experienced negotiators would use cooperative strategies in primarily integrative negotiations to increase joint gains, and Hypothesis 5, which predicted that higher incentives would accentuate this effect, were not supported. It also means that Hypothesis 4, which stated that experienced negotiators would be more competitive in primarily distributive negotiations when the incentives were large, is partially supported: higher incentives led to better performance by experienced negotiators when the issues and the task were both distributive. (6) The four-way interaction revealed different effects for the integrative and distributive issues, as determined by a series of simple effects analyses, discussed below. Hypothesis 6 predicted that experienced negotiators with information about their counterpart's preferences in high stakes, primarily distributive negotiations would be particularly opportunistic and do extremely well on the distributive issues. This was a prediction of a five-factor interaction. The data showed that experienced negotiators did extremely well when the task was distributive, the issues were distributive, and incentives were high; in other words, four of the five factors interacted significantly, as anticipated. Hypothesis 7 made the corresponding prediction for primarily integrative negotiations, that experienced negotiators with information about their counterpart's preferences would be particularly successful at maximizing joint gains when the stakes were high. The only missing element to support both hypotheses was that experi-

enced negotiators' gains did not depend upon having explicit information about their counterpart's preferences: whether they had this information or not, experienced negotiators were successful in reaping very large profits on the distributive issues in primarily distributive tasks when incentives were high, and in the integrative negotiations. These effects are addressed further in the judgment accuracy section.

Table 4
Significant Effects From the Overall Analyses of Individual Performance Scores in Study Two

Effect	Raw Scores		Percentage Scores	
	F–ratio	$p <$	*F*–ratio	$p <$
Bargainer experience	23.03	.001	31.56	.001
Experience by task	9.46	.005	8.47	.005
Experience by issues	17.12	.001	23.57	.001
Experience by task by issues	12.99	.001	7.52	.001
Experience by task by incentives	7.80	.01	11.06	.001
Experience by task by issues by incentives	2.26	.11	5.29	.01

Note: Issues were also significant in both analyses, but this was an artifact of the variations in payoffs that were possible for the distributive, integrative, and compatible issues. No other effects were significant in either analysis.

Table 5
Performance Scores (and Percentages) for Each of the Issues in the Significant Experience by Task by Issues by Payoffs Interaction

A. Primarily Distributive

	Issues					
	Compatible		Distributive		Integrative	
	Experienced	Naïve	Experienced	Naïve	Experienced	Naïve
Low Payoffs	2745	2745	2740.5	659.3	970.4	933.6
	45.7%	45.7%	62.3%	37.7%	48.8%	46.7%
High Payoffs	2841.5	2841.5	3119.6	1280.0	982.6	880.8
	47.4%	47.4%	70.9%	29.1%	49.1%	44.0%

B. Primarily Integrative

Low Payoffs	2880	2880	1104.2	696.8	3830.0	3225.0
	48.8%	48.0%	61.3%	38.7%	47.9%	40.3%
High Payoffs	2895	2895	869.7	930.3	3321.9	3603.8
	48.2%	48.2%	48.3%	51.7%	41.5%	45.0%

Integrative Issues. Analyses of the integrative outcomes led to no significant effects for either raw or percentage scores. Although scores varied among conditions, negotiators generally did well, with each pair's average exceeding 85% of the available total in each condition and each individual's average exceeding 40% of the 50% they could have obtained.

Distributive Issues. Analyses of the distributive outcomes revealed significant effects for both raw and percentage performance scores for experience, for experience by tasks, and for the experience by tasks by incentives interaction (all F–ratios exceeded 7.90, $p < .01$). Clearly, the distributive issues account for the bulk of the significant effects in the overall analyses. Except for the primarily integrative, high incentive negotiations, experienced negotiators' average outcomes far exceeded naïves' for the distributive issues, particularly when incentives were high and the negotiation was primarily distributive; in this condition, experienced bargainers' outcomes were 2.44 times larger than the naive negotiators.'

Joint Performance

Compatible Issues. Negotiators were generally successful in maximizing their outcomes on the compatible issues: 73.7% of the dyads obtained the maximum possible outcome. Analysis of variance of the between subject factors (tasks, incentives, and information) after the removal of four outliers[6] led to no significant effects. For the great majority of the pairs, informed and uninformed dyads did equally well on the compatible issues.

Integrative Issues. Just over one in three pairs (26 of 74; 34.2%) maximized joint outcomes on the integrative issues. Most divided the integrative outcomes equally. In 21 pairs (27.6%), the experienced bargainer obtained more than an equal split of the maximum available; in 11 pairs (14.5%), the naive bargainer did better than half. Analysis of the effects of tasks, incentives, and information on joint integrative performance scores led to one significant effect, for tasks, F (1, 68) = 4.99, $p < .03$: negotiators integrated more effectively when the task was primarily distributive (M = 94%) than when it was primarily integrative (M = 86%).

Judgment Accuracy

At the end of the experiment, participants indicated how much they knew about their counterparts' preferences.[7] The naïve bargainers' estimates of their counterparts' preferences should not have been affected by the information conditions, and they were not ($F < 1$, *ns*). They correctly perceived the experienced bargainers' preferences on the integrative issues 28.6% of the time; they recognized

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[6]Four informed pairs reached agreements quickly, using only about 60% of the available time (compared to over 82% in the other pairs) and achieved only 60% of the total possible outcome. This suggests that they were motivated not to do well but to finish quickly.

[7]Several respondents (10 experienced participants and 15 naives) did not answer the judgment accuracy questions for the integrative issues. Of these 25, 10 (4 experienced and 6 naive) did not answer the accuracy questions for the compatible issues. Non-respondents (the total of 25 and the subset of 10) were scattered across conditions.

identical preferences on both of the compatible issues 59.5% of the time and identical preferences on one 75.7% of the time. This suggests that the experienced bargainers did not often reveal their preferences during the negotiations.

Participants who were informed of their counterparts' preferences were (not surprisingly) more accurate than uninformed bargainers: 83.8% accurately recognized the two integrative issues [versus 43.5% when they were uninformed; t (81) = 4.06, $p < .001$]. Information, however, did not significantly affect their accuracy on the compatible issues: they recognized one or both compatible issues 80.5% of the time in both information conditions. Thus, most experienced bargainers understood the nature of the compatible issues, whether or not it was made explicit. In addition, uninformed but experienced negotiators made more (but not significantly more) accurate judgments than naive negotiators on the integrative issues (Ms = −.09 vs. −.40; t = 1.61, $p < .11$) and on the compatible issues (Ms = .96 vs. .75; t = .68, $p < .50$). This suggests that the experienced negotiators did not need to have the naïve negotiators' preferences revealed: it appears that they could detect their preferences during the negotiations anyway. This provides a substantive explanation for the absence of information effects in the statistical analyses.

Negotiation Process

Of the 76 pairs who reached agreement, 14 did not discuss the compatible issues. Experienced bargainers in these pairs typically accepted what their naïve counterparts offered. Of the remaining 62 pairs, bargainers sometimes made both deceptive and truthful statements, even for the same issue, during the negotiations. No one lied about both compatible issues, but 33.9% of the experienced bargainers lied about one compatible issue and were deceptive about the other. Segmenting the data on the basis of the independent variables, agreements versus disagreements, or the two compatible issues revealed no significant differences across conditions. When experienced negotiators knew the naive bargainer's preferences and made statements about one of their compatible issues, however, just more than 50% acted deceptively. This suggests that many experienced bargainers were attempting to use the information they obtained opportunistically, to the disadvantage of the naive bargainer.

Discussion and Conclusions

Although virtually every prescriptive treatment of negotiation alludes to the risks of providing a bargaining opponent with information about one's preferences, little empirical research supports this assertion. Our experiments addressed the information dilemma by presenting bargainers with primarily integrative and primarily distributive negotiations, which we believed would motivate negotiators to either maximize their joint benefits or exploit information for their own individual gain. We also trained people in multi-issue negotiations to establish substantive expertise, offered a large cash prize, and gave complete information about the naïve bargainer's preferences to some of the experienced bargainers. In other

words, we attempted to represent a large array of potentially realistic negotiations. The results showed that experienced bargainers obtained better outcomes than naïve negotiators, especially in distributive negotiations on distributive issues when incentives were large. They were also deceptive in many of their negotiations, either actively or passively.

These results provide initial support for the information dilemma model. Experiment 1 suggested that informed, experienced negotiators did better individually than their uninformed counterparts when the issues were distributive and that experienced negotiators, with or without preference information, did well in achieving maximum joint outcomes in primarily integrative negotiations. Experiment 2 suggested that experienced bargainers were adept at gaining information about their counterparts' preferences during their negotiations. They also did extremely well individually when the task and the issues were distributive, especially when the stakes were high. Thus, it appears that information exchange can make a considerable difference to the process and outcomes of negotiations.

Some of the support for the information dilemma model may have come from the utilization of a broad range of antecedent variables that were selected to highlight some of the underlying dynamics of these issues. In particular, the current results can be framed by considering the kinds of incentives that have been included in many previous studies. Consider three types of incentives—financial (which concern only a person's own monetary outcomes), interpersonal (which focus on joint outcomes and maximizing relationships), and intrinsic (which concern a person's own individual, non-monetary interests)—and three conditions: where financial and interpersonal incentives are absent and intrinsic interests provide the primary incentives; where interpersonal incentives are present and add to an individual's intrinsic incentives; and where financial incentives dominate. Most previous studies (e.g., Pruitt & Lewis, 1975) investigated the first type of incentive by using intrinsically interesting tasks, pairing people anonymously, providing no identification with others, and offering minimal if any financial rewards. In such situations, performance on both distributive and integrative aspects of a negotiation is often quite poor.

With interpersonal incentives added, bargainers are likely to achieve better performance on the integrative rather than distributive aspects of their negotiation. Integrative bargaining tasks represent problems that require solutions that can provide both personal and interpersonal satisfaction. In contrast, distributive bargaining, while individually valuable, is interpersonally costly: it requires tough stances and may lead to deceptive strategies. Thus, although interpersonal incentives may accentuate the integrative rather than the distributive aspects of the negotiation, sufficient financial incentives may overshadow the rewards of integration (see Dawes, 1980; Pillutla & Murnighan, 1995). In our model, we predicted strong effects for distributive issues in the primarily distributive negotiations when incentives were high. This prediction was supported and is one of the strongest findings in our study.

Our model of the information dilemma includes both a positive, cooperative component and a negative, competitive component. Previous research (e.g., Thompson, 1991), which rarely used large financial incentives, tended to focus on the cooperative component, finding that information increased joint gain. The present results also provide the alternative view: information was used competitively in distributive negotiations. Having experienced bargainers negotiate in Experiment 1 led to considerable joint gain whereas experienced negotiators in Experiment 2 often used their experience to augment their own individual outcomes.

Experiment 2 also differed from previous research in another respect. In many other studies, negotiators interacted face to face; in Experiment 2, negotiators communicated via computerized networks. Recent research by Valley, Moag, and Bazerman (1998) shows that face-to-face negotiations allow negotiators to discover joint gains that an exchange of written proposals and messages cannot achieve. This suggests that computer negotiations may be an impoverished medium that contributes to a reduction in joint outcomes, possibly due to a reduction in cooperativeness, as machine interfaces may reduce the interpersonal pressure on bargainers to be cordial and agree to each other's requests. The expanded interpersonal distance that the computer provides may have allowed bargainers to be more pointed, more direct, and more competitive in their strategies. Although these remain conjectures, the current findings provide the basis for future research to determine the conditions that might promote the positive and the negative sides of the information dilemma.

The data suggest that the experienced negotiators in our study shared little information about their own preferences with their counterparts, even when they were given the naïve bargainer's preferences. These results are consistent with those of Thompson (1991) in that people who provided information did not tend to elicit information in turn. People who *sought* information in her study, however, were not only successful in obtaining it but also tended to reciprocate and provide information as well. In this study, experienced bargainers did not receive information from their counterparts; they received it from another source, the experimenter. This potentially critical difference is also reflected in Leventhal, Allen, and Kemelgor's (1969) results. They observed interactions where either a chance mechanism or another equally productive performer overcompensated an experimental participant who had also worked on a simple task. Being rewarded by the chance mechanism led overcompensated participants to transfer little of their winnings to undercompensated performers. But when the other performer provided the overcompensation, people did transfer money back to them. In fact, they transferred enough to make both of their monetary outcomes equal. Thus, the source of monetary or informational benefits may determine whether reciprocity follows, suggesting that negotiators who do not receive information from their counterparts will not offer it either.

The current results also suggest that giving experienced negotiators explicit information about compatible issues may have been unnecessary: their judgment accuracy scores suggest that, during negotiations, they obtained this information anyway. In contrast, their accuracy on integrative issues was dependent upon explicit information. The data suggest that uninformed, experienced negotiators were as successful as informed, experienced negotiators because they gained information during the negotiations and used distributive strategies with equally effective impact.

The current study did not provide naïve bargainers with information about their counterparts' preferences. This was intentional on our part, to keep the size of the design under control and because our model suggested that naïve bargainers would not have used this information very effectively. Recent work by Weingart and her colleagues (Weingart, Hyder, & Prietula, 1996), which shows that naïve bargainers tend to know distributive but not integrative tactics, also suggests that providing them with information might have more impact in primarily distributive than in primarily integrative negotiations. All of these issues, of course, are open for future research.

The implications of the current findings for organizations are clear. Information sharing is critical in organizations: if everyone does not bring all of the relevant information they control to bear on cross-organizational issues, retaining it instead to maximize their own personal benefits, organizations suffer (Argyris, 1957). More specifically, the information dilemma in negotiations can mean that internal coordination and the joint maximization of possible benefits will not be achieved. This research clearly documents the risks that are associated with the release of information in negotiations; application to organizational settings, in field or case studies, would seem like another logical next step for research.

This study also highlighted the effects of high stakes on the bargaining behavior of experienced business school students, the future managers of organizations. Although the current project's experimental context lacks most of the social complexity of organizational life, as we move to a more virtual world, we can wonder whether the current results might have even greater applicability in new organizational contexts. These experiments provided participants with an opportunity to act opportunistically, and many did, particularly when the stakes were high. The possibility that similarly individualistic behavior might occur when negotiators are distant from one another, either inside or between organizations, is clearly a topic for future research. In particular, organizational interventions, whether incentive-based, cultural, or transformational, may be a fertile topic as potential solutions to the information dilemma and its serious and inefficient personal and organizational consequences. More generally, whether the positive, cooperative side of the information dilemma, and the dynamics that promote it, can be transferred to the more individualistic, competitive side is a potent challenge for future research.

The information dilemma can have wide-ranging negative consequences. Unless information can be effectively shared, even when individual incentives exist

to be circumspect, potential joint gains may not be achieved. When such joint gains are of only limited value (i.e., in primarily distributive interactions), the information dilemma model predicts that people will guard their information. As interactions become more integrative, however, information dilemmas may pose some of the same problems that social dilemmas (e.g., Dawes, 1980) present. That is, by withholding information, individuals may be unable to maximize their joint gains, just as by withholding their contributions, individuals may be unable to create public goods and the joint gains that they offer. One avenue for unlocking the problems of inefficient social dilemmas might be to find ways for information to be shared. In other words, information dilemmas may be easier to solve than social dilemmas. And in doing so, insights into the broader context of the problems of social dilemmas may surface. That is, by discovering ways to improve information sharing we might also be able to discover new insights into improving individual contributions to a public good. Such advances might hold promise for promoting greater collective benefit. For that, we can be both diligent in our research, and hopeful.

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