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Social Motives and Strategic Misrepresentation in Social Decision Making

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In 4 experiments, the authors studied the influence of social motives on deception and strategic misrepresentation. In a newly developed information provision game, individuals faced a decision maker whose decision would affect both own and other's outcomes. By withholding information or by giving (in)accurate information about payoffs, participants could try to influence other's decision making. Less accurate and more inaccurate information was given when the decision maker was competitive rather than cooperative (Experiment 1), especially when participants had a prosocial rather than selfish value orientation (Experiments 3 and 4). Accurate information was withheld because of fear of exploitation and greed, and inaccurate information was given because of greed (Experiment 2). Finally, participants engaged in strategic misrepresentation that may trick competitive others into damaging their own and increasing the participant's outcomes.

In Mark Twain's (1876) classic novel *The Adventures of Tom Sawyer*, Tom Sawyer is painting Aunt Polly's fence when Ben Rogers walks by, eating an apple and heading for the river to go for a swim. When Ben asks Tom why he is painting the fence, Tom decides not to answer truthfully—instead he tells Ben that painting the fence is a most gratifying activity. Tom is so convincing that he actually arouses a strong desire in Ben to engage in whitewashing. After some negotiation, Tom hands the brush over to Ben and lies down in the shadow, savoring the rest of Ben's apple. By misrepresenting his true preferences, Tom manipulates Ben Rogers to make a decision that is favorable to Tom.

Although few of us may be as cunning and convincing as Tom Sawyer, we often find ourselves in situations where we can influence others by manipulating and misrepresenting information. Car owners may deliberately conceal technical problems when trying to sell their cars (Schweitzer & Croson, 1999), and, when negotiating a divorce, a husband may misrepresent the importance of having child custody to induce his spouse to concede on alimony costs (O'Connor & Carnevale, 1997).

Lying, deception, and misrepresentation have been of interest to the social sciences for decades. Most work has focused on the ability to distinguish cheaters from noncheaters (e.g., Cosmides & Tooby, 1992; DePaulo, 1992). Far less research has been concerned with the kind of behavior Tom Sawyer engages in—the active misrepresentation of values, preferences, and priorities. Extending interdependence theory (Kelley & Thibaut, 1978; Rusbult & Van Lange, 1996, 2003) and goal expectation theory (Pruitt & Kimmel, 1977), we study the influence of one's counterpart's cooperative or competitive motivation and one's prosocial or selfish value orientation on the tendency to provide accurate or inaccurate information, answering such basic questions as "when and why are people likely to deceive their counterparts?" and "how do people fine-tune the provision of accurate or inaccurate information to influence their counterpart's decision making?"

Misrepresentation in Social Interaction

Misrepresentation, lying, and deception have been the subjects of considerable research in psychology. Social psychologists have focused on the individual's ability to detect lying and deception (e.g., DePaulo, Lanier, & Davis, 1983; Ekman, O'Sullivan, & Frank, 1999; Riggio & Friedman, 1983; Vrij, 2001; Zuckerman, Koestner, & Alton, 1984; see also DePaulo et al., 2003). Even when people try hard to suppress and misrepresent their true feelings and thoughts, they usually are not very successful (e.g., DePaulo, 1992; Ekman & Friesen, 1982; Vrij, Edward, & Bull, 2001; Zuckerman, Lipets, Koivumaki, & Rosenthal, 1975). Lie detection has also received much attention in forensic and applied psychology. For instance, research has looked at the effectiveness of technical devices such as the polygraph to tell truth tellers from liars (e.g., Bashore & Rapp, 1993).

Relatively few studies have addressed the conditions that foster or inhibit people's tendency to be truthful and accurate or dishonest and inaccurate. Relevant work has been conducted in the context of social conflict and interpersonal negotiation. In conflict and negotiation, individuals experience mixed-motive interdependence. They have cooperative incentives to work with the other party to increase joint gain and competitive incentives to work against the other party to increase personal gain (Schelling, 1960). The cooperative incentive makes the situation conducive to the exchange of accurate information, which can increase joint gain (Thompson, 1991). The competitive incentive makes the situation conducive to the use of misrepresentation, because successful deception can foster one's immediate self-interest (Triandis et al., 2001). Thus, individuals in mixed-motive interdependence find

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themselves in the so-called *information dilemma*—should they provide accurate information to achieve high collective outcomes or strategically misrepresent their preferences to secure good personal outcomes (Kelley & Thibaut, 1978; Murnighan, Babcock, Thompson, & Pillutla, 1999)?

Experiment 1

Individuals caught in an information dilemma engage in a variety of deceitful activities (e.g., Kelley, 1966; Lewicki, 1983). Deception increases when parties know their counterpart lacks information (Boles, Croson, & Murnighan, 2000) or when the stakes are high (Tenbrunsel, 1998). Also, misrepresentation is more likely when negotiators have experience with the task at hand (Murnighan et al., 1999), when they face a stranger rather than a friend (Schweitzer & Croson, 1999), and when they aim to maximize personal rather than joint gains (O'Connor & Carnevale, 1997). In short, the above research suggests that people deceive more when there is a greater need to serve one's own interests, or there is more opportunity to do so, or both.

Perception of Other's Competitiveness

People sometimes assume that their counterparts are competitive and "out to get them"; on other occasions they believe that their counterparts have cooperative intentions and can be trusted (e.g., Kelley & Stahelski, 1970). Burnham, McCabe, and Smith (2000) found that counterparts described as "partner" elicit more cooperation than those described as "opponent." Other studies have shown that people see others as cooperative rather than competitive when they have a history of cooperative rather than competitive exchanges (e.g., Lindskold & Han, 1988), when they expect to work together in the future (e.g., Ben-Yoav & Pruitt, 1984), or when those others are friends rather than strangers (Fry, Firestone, & Williams, 1983). Also, individuals differ in their propensity to trust others (Parks, Henager, & Scamahorn, 1996), and when individuals are inclined to be cooperative, they tend to assume others are cooperative rather than competitive (e.g., Iedema & Poppe, 1995).

Work on lying and deception has ignored the fact that individuals perceive their counterpart to be either competitive or cooperative, even though various lines of research point to its importance. Facing a competitive rather than a cooperative other reduces the inhibition to engage in unethical behavior (Rubin, Pruitt, & Kim, 1994) and may make greed (i.e., the desire to get high personal outcomes) more salient. To increase personal outcomes, people may use lying and deception. Facing a competitive other also increases the fear of exploitation (Pruitt & Kimmel, 1977); hence, to safeguard one's own outcomes, people may turn to lying, deception, and strategic misrepresentation. We predict, therefore, that facing a competitive rather than a cooperative other reduces the provision of accurate information and increases the provision of inaccurate information—Hypothesis 1.

Hypothesis 1 relates to the amount of deceit and extends interdependence theory (Kelley & Thibaut, 1978; Rusbult & Van Lange, 1996, 2003) and goal expectation theory (Pruitt & Kimmel, 1977) to the domain of lying and deception. However, neither this hypothesis nor the theories and research preceding it specify the direction of deceit. Therefore, the question of how people misrepresent information when dealing with a competitive other remains. Noncooperative tendencies may be reflected in withholding information or in focused misrepresentation explicitly aimed at misleading the counterpart about the structure of the decision-making task. Thus, the specific direction of deceit in the case of a competitive counterpart is less straightforward than it may appear at first.

When one's own interests are opposite to those of a competitive other, one serves one's own interests best by pretending that one's gains as well as one's losses would exceed the gains or losses of the opponent. Imagine, for example, that your competitive counterpart has to choose between X and Y. To him or her, X is worth 0 points, and Y is worth 5 points. The other does not know that to you, X and Y are worth 5 and 0 points, respectively (i.e., there are opposed interests, but the competitive other does not know this). If you are honest about your outcomes, your competitive counterpart will be tempted to choose Y because this maximizes his or her relative gain (i.e., 5 points for him or her and 0 points for you). To avoid this bad result and to secure good personal outcomes, you could mislead the other by informing him or her that X gives you a negative outcome (e.g., −10 points), and Y gives you outcomes greater than his or hers (e.g., +10 points). By doing so, you may tempt the competitive counterpart to choose X instead of Y, having induced him or her to believe that X maximizes relative gain (i.e., 0 points for him or her and −10 points for you), whereas Y maximizes relative loss (i.e., 5 points for him or her and 10 points for you). If your strategic misrepresentation is successful, your personal end result will be good (remember that although the other thinks otherwise, X is worth 0 points to him or her and 5 points to you).

This example could be seen as a numerical shorthand for the episode discussed above in which Tom Sawyer claims that to hand over the whitewashing to Ben would mean to deprive himself of a most pleasurable diversion, thus tempting Ben to get the "treat" at a price—he has to part with his apple before he can take over the whitewashing. It also illustrates our prediction that with a competitive rather than a cooperative other, people strategically misrepresent their losses as exceeding those of their counterpart and their gains as being bigger than those of their counterpart—Hypothesis 2.

Overview of the Experiment

In Experiment 1, participants played an information provision game developed for this study. In this game, participants face a counterpart who will make a decision that yields outcomes to him- or herself and to the participant. The game is set up so that the participant and the decision maker have opposed interests. However, participants are told that the decision maker knows the consequences of his or her decision to his or her own outcomes but is unaware of the consequences of his or her decision to the participant's outcomes (i.e., the decision maker does not know that the situation involves opposed interests). Participants, in contrast, have full information about own and other's outcomes, and, prior to the decision making, get the opportunity to inform the decision maker of the consequences of his or her decision for the participant's outcomes. Participants can present the situation accurately as involving opposed interests, withhold information, misrepresent the situation as predicted in Hypothesis 2, or anything in between.

The information provision game thus allows one to assess (a) the amount of accurate and inaccurate information participants give and (b) the direction of deceit, that is, the way participants present the situation to their counterpart.

The numerical example we give above when developing Hypothesis 2 involves a *zero-sum* situation—other's gain mirrors own loss and vice versa. Opposing interests are not always zero-sum; when one party's gain exceeds the other party's loss, the situation is called *variable-sum* (Schelling, 1960). Although people in zero-sum and variable-sum situations sometimes have full information and know about their own and the other's outcomes, they often have incomplete information and only know their own outcomes but not those of their counterpart (Pruitt, 1998). In these incomplete-information situations, people are likely to make the so-called *fixed-pie assumption*—they assume the situation is zero-sum, and their behavior reflects this assumption (De Dreu, Koole, & Steinel, 2000; Thompson & Hastie, 1990).

Some prior studies on deceit used zero-sum tasks (e.g., Boles et al., 2000), others used variable-sum tasks (e.g., O'Connor & Carnevale, 1997), and still others used incomplete-information tasks (e.g., Schweitzer & Croson, 1999). No previous work has examined deceit as a function of (knowledge about the) task structure. Furthermore, because we know little about the direction of deceit and because the precise structure of the situation may influence whether and how people misrepresent it in unknown ways, we felt it desirable to examine the amount and direction of deceit across zero-sum, variable-sum, and incomplete-information tasks.

The decision maker was depicted as either cooperative or competitive (we also included a control condition in which no information about the decision maker was given). According to Hypothesis 1, facing a competitive rather than cooperative other reduces the provision of accurate information and increases the provision of inaccurate information. According to Hypothesis 2, individuals will strategically misrepresent the payoff structure to competitive but not to cooperative others, so that own loss and own gain will seem to exceed other's loss and other's gain, respectively. We had no a priori hypotheses about the influence of task structure; this variable was included to examine the generality of findings in different versions of the newly developed information provision game.

Method

Participants and design. Two hundred fourteen students at the University of Amsterdam (136 women and 78 men) were randomly assigned to the conditions of a 3 (other's motivation: cooperative, competitive, unknown) × 3 (task structure: variable-sum, zero-sum, incomplete information) between-participants factorial design. They received 20 Dutch guilders (approximately $8 US) for participation. Dependent variables were the information participants gave about their payoffs and perceptions of the other.

Procedure and independent variables. On arrival in the laboratory, participants were seated in cubicles equipped with a computer, a pen, and several blank sheets of paper. To manipulate other's cooperative or competitive goals (see also below), participants were asked to complete a "collaboration skills test as part of a large-scale test-development project that is not related to the other tasks in this experiment."[1] The test contained 20 items dealing with cooperation in daily life (e.g., "In the bus, I stand up and let older people have my seat"; "I enjoy working with other people"; "Winning is everything"; "I like situations in which I can compete with others"). Participants indicated their agreement with each item on a 5-point scale (1 = *completely disagree*, 5 = *completely agree*). Prior research has shown that the scale has high face validity and can be convincingly used to generate false impressions about another person's motives (De Dreu & Van Kleef, in press). However, because true scale validity is unknown, it cannot be used to classify participants in terms of their social value orientation. We return to this in Experiments 3 and 4. On completion of the "collaboration skills test," materials were collected, and participants started with a new task on the computer. On their computer screens, they read the instructions for a decision game that involved two players who would interact via the network. Participants were told that they would never find out with whom they played, and roles (Player 1 or Player 2) would be determined at random. In fact, each participant was placed in the role of Player 1.

The purpose of the decision game was to determine an outcome concerning two issues, A and B. On each issue, one out of three levels, x, y, or z, had to be chosen. Player 2 (henceforth, *decision maker*) would choose a level for both issues A and B, and this decision would determine both his or her own outcomes and the outcomes of Player 1 (henceforth, *information provider*). Participants read that the decision maker would receive information about his or her payoffs but would never receive objective information about the information provider's payoffs. The decision maker was therefore unaware of the actual structure of the situation. The information provider would, however, receive information about his or her own payoffs and also about the decision maker's payoffs (except in one condition; see below).

The information provider would start the game by sending a message to the decision maker with information about the outcomes he or she would receive for each of the possible decision options (x, y, and z, for issues A and B) the decision maker could choose from. The decision maker would then be asked to make a decision determining both his or her own outcomes and the information provider's outcomes. It was emphasized that decisions would result in a number of points and that at the end of the experiment, points would be converted into lottery tickets. The more points gained, the more lottery tickets one would get and the greater one's chance of winning a prize of 50 guilders (approximately $20 US).

Participants received their payoff tables and a detailed explanation. A quiz ensured that the instructions were understood. Table 1 shows the zero-sum, variable-sum, and incomplete-information tasks used in this experiment. As can be seen there, payoffs for the participant were identical in all three tasks. They could earn 6, 3, or 0 points on Issue A, and 2, 1, or 0 points on Issue B, on the levels z, y, and x, respectively. The decision maker's payoffs differed, depending on experimental condition. Participants in the incomplete-information condition did not get any information about the decision maker's payoffs. Participants in the zero-sum task condition were shown the other's payoffs, which were the mirror image of their own. Finally, participants in the variable-sum task condition were told that the other would get 2, 1, or 0 points on Issue A and 6, 3, or 0 points on Issue B, on the levels x, y, and z, respectively. The information that the participant was Player 1; the payoff table of Player 1; and, in the variable-sum and zero-sum conditions, the payoff table of Player 2 remained visible on the screen (see Figure 1).

We then manipulated the decision maker's motivation. Participants were told that we were interested in the effect of having information about the other player, and that they, but not their counterpart, were randomly selected to receive some information about the counterpart derived from the "collaboration skills" measure filled out earlier. They received the test allegedly done by the other, with circled numbers on the rating scales for each item manipulated in such a way that the other appeared either competitive or cooperative. For example, participants in the cooperative-

[1] The original language of all instructions and materials used in the four experiments was Dutch.

Table 1
Payoff Tables Used in Experiment 1 (Participants Are Player 1)

	Outcome to Player 1		Outcome to Player 2	
Level	Issue A	Issue B	Issue A	Issue B
		Zero-sum task		
x	0	0	6	2
y	3	1	3	1
z	6	2	0	0
		Variable-sum task		
x	0	0	2	6
y	3	1	1	3
z	6	2	0	0
		Incomplete-information task		
x	0	0		
y	3	1		
z	6	2		

Note. Participants (Player 1) were told that their (fake) Player 2 did not receive information about the Player 1's outcomes and only received information about their own (Player 2) outcomes.

other condition saw that the other had answered "4" on the item "In the bus, I stand up and let older people have my seat" (i.e., he or she agreed); participants in the competitive-other condition saw that on this item the other had answered "2" (i.e., he or she disagreed; see also De Dreu & Van Kleef, in press). In the unknown-other condition, no information about the test results was given.

It was then repeated that the decision maker had no objective information about the payoffs of the information provider and would never get any. Participants were told that they could provide information about their own payoffs to the decision maker, that is, they could show the decision maker what their payoff table looked like. For this purpose, they could fill out an empty payoff table that would afterward be sent to the decision maker. Participants were also told that they could give as much information as they wanted and were free to choose between giving accurate and inaccurate information. Participants were then shown an empty payoff table. On the same screen, there was a row of 25 boxes containing the numbers from −12 to +12 and a box containing a question mark. Participants were told that for each of the six cells of the payoff table, they could select by mouse click either a number between −12 and +12 or click on the box with the question mark when they did not want to give any information about their points in that cell (see Figure 1). The choice would then appear in the appropriate cell of the payoff table (see Figure 2). Having made their choices for all six cells, participants could change their choices as often as they wanted. Once they clicked the "send" button, however, their choices would become irreversible. The payoff table with the values participants pretended to get (in cells xA, yA, zA, xB, yB, and zB) was then allegedly sent to the decision maker. The reader can consult Figures 1 and 2 for the

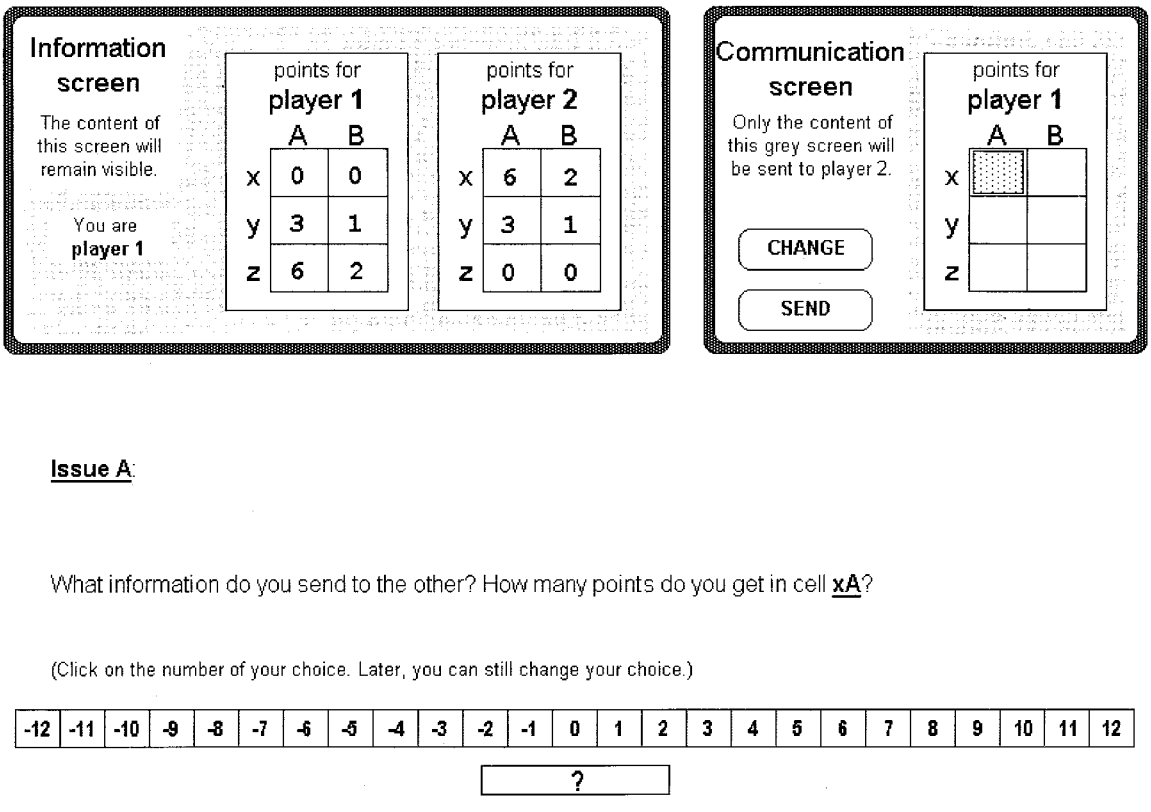

Figure 1. The computer screen participants saw when providing information. Translated from Dutch. Once a participant entered a number (or question mark) in the xA cell of the communication screen, a new question prompted the participant to enter a number in cell yA, and so on until all cells were filled. Only then could the "send" function be used.

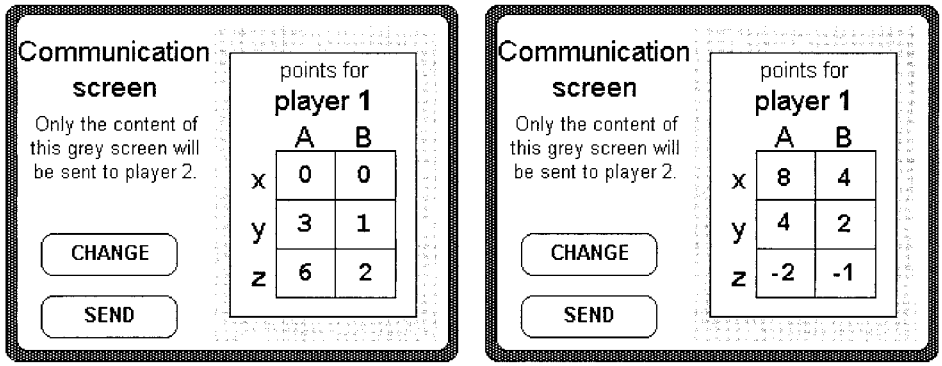

Figure 2. Hypothetical patterns of information given to a cooperative (left panel) or competitive (right panel) other. The hypothetical patterns actually resemble what was found for the "direction of deceit" measures taken in Experiments 1 and 3 (see also Figure 3).

computer screen the participants saw during the game, along with two hypothetical response screens, one filled out by a participant providing full and accurate information and one filled out by a participant providing full but inaccurate information as predicted in Hypothesis 2.

Dependent measures. The numbers participants pretended to be the values of the cells xA, yA, zA, xB, yB, and zB in their payoff table were used to create two related indices of information provision. We classified all information as accurate (i.e., identical with the actual value) or inaccurate (i.e., different from the actual value). By counting the cells that contained accurate and inaccurate information, we calculated an amount of accurate information and an amount of inaccurate information. Both indices are discrete and range between 0 and 6, and their sum equals the total amount of information given. Because participants had to enter numbers or question marks into six cells of the payoff table, the number of cells in which they gave no information equals six minus the total amount of information. After sending the information, participants rated their impression of the other on a 5-point scale (1 = *cooperative*, 5 = *competitive*) and were then debriefed, paid, and thanked for participation.

Results

Manipulation check. A 3 (task structure) × 3 (other's motivation) analysis of variance (ANOVA) showed that competitive others were seen as more competitive ($M = 4.18$, $SD = 0.96$) than unknown ($M = 2.91$, $SD = 1.16$) and cooperative others ($M = 2.01$, $SD = 1.01$), $F(2, 205) = 71.13$, $p < .01$. A Duncan test ($p < .05$) revealed that all conditions differed from each other.

Amount of accurate and inaccurate information. To test Hypothesis 1, we analyzed the amount of accurate and inaccurate information in a 3 (other's motivation) × 3 (task structure) × 2 (information: accurate or inaccurate) ANOVA with the last factor as a within-participants variable. A within-participants main effect for information showed that participants provided more inaccurate than accurate information ($M = 2.91$, $SD = 2.37$ vs. $M = 2.19$, $SD = 2.28$), $F(1, 205) = 9.97$, $p < .01$. An interaction between information and other's motivation, $F(1, 205) = 22.18$, $p < .01$, qualified this main effect. Cell means are shown in Table 2. Participants gave more accurate information when the other was cooperative rather than competitive, with the unknown other in between, and gave more inaccurate information when the other was competitive rather than cooperative. This supports Hypothesis 1. No other effects were found.

Direction of deceit. To examine the direction of deceit, the information provided in each cell was submitted to a 3 (task structure) × 3 (other's motivation) × 2 (issue: A vs. B) × 3 (level: x vs. y vs. z) ANOVA with the last two variables as within-participants factors. Question marks were treated as missing values, which led to the exclusion of 71 participants.

A main effect of issue showed that participants correctly told the decision maker that they got more points on Issue A than on Issue B ($M = 2.36$, $SD = 2.39$ vs. $M = 1.98$, $SD = 2.55$), $F(1, 134) = 4.00$, $p < .05$. This effect was qualified by an interaction between issue and other's motivation, $F(2, 134) = 4.60$, $p < .02$. With a cooperative other, participants presented Issue A as more valuable than Issue B ($M = 2.35$, $SD = 2.98$ vs. $M = 1.55$, $SD = 2.98$); $t(52) = 3.29$, $p < .05$. With an unknown other, the pattern was the same, but not significant ($M = 2.51$, $SD = 2.39$ vs. $M = 1.88$, $SD = 2.16$); $t(49) = 1.77$, $p < .10$. With a competitive other, there was a tendency to present Issue A as less valuable than Issue B ($M = 2.19$, $SD = 1.62$ vs. $M = 2.67$, $SD = 2.16$); $t(39) = -1.73$, $p < .10$.

An interaction between issue and level, $F(2, 133) = 3.91$, $p < .05$, basically reflects the specific numbers given in the payoff tables. It shows that participants accurately stated that Issue A was more valuable to them than Issue B on Level y and Level z, $t(142) = 2.78$ and 2.76, respectively, ps $< .01$, whereas there was

Table 2
Amount of Accurate and Inaccurate Information as a Function of Other's Motivation, Experiment 1

	Other's motivation		
Information	Cooperative	Competitive	Unknown
Accurate			
M	3.23_a	0.84_c	2.25_b
SD	2.36	1.23	2.31
Inaccurate			
M	2.08_a	4.26_b	2.63_a
SD	2.44	1.89	2.39

Note. Means within one row not sharing the same subscript differ at $p < .05$, according to Duncan *t* tests.

no difference in value between the issues on Level x, $t(142) = -0.87$, *ns.* Cell means and standard deviations are shown in Table 3.

More importantly, an interaction between other's motivation and level, $F(4, 268) = 11.45$, $p < .01$, shows that participants were quite honest with a cooperative other and gave information that closely matched the actual values of 0, 2, and 4 points at Levels x, y, and z, respectively. With a competitive other, however, people misrepresented their interests: The pretended value decreased from $M_x = 5.73$ ($SD = 3.48$) through $M_y = 2.03$ ($SD = 3.18$) to $M_z = -0.46$ ($SD = 4.58$). The information given to an unknown other was in between, showing intermediate levels of misrepresenting preferences and priorities within issues (see Figure 3).

The effect shown in Figure 3 was further qualified by a three-way interaction between other's motivation, level, and issue, $F(4, 268) = 6.90$, $p < .01$. Cell means are shown in Table 3. Participants with a cooperative or an unknown other truthfully stated that Level z was of a high value. The information that Cell zA is higher in value than Cell zB was truthfully given to a cooperative and an unknown other, $t(52) = 5.03$ and $t(49) = 3.34$, respectively, ps $< .01$. Participants with a competitive other, however, pretended that Level z was of a low value and that Cell zA was of lower value than Cell zB, $t(39) = -3.63$, $p < .01$.

Although these findings are in line with Hypothesis 2, they do not tell us how many people did indeed present their own outcomes as negative when the other got zero or as exceeding the other's positive outcomes. We examined the number of participants who pretended to get negative outcomes in Cells zA and zB (see Table 1) as a function of other's motivation. We excluded participants in the incomplete-information task condition because they had no information about other's outcomes (including them did not change the results). For Cell zA, fewer people with a cooperative (2 out of 51; 4%) or an unknown (5 out of 54; 9%) counterpart than people with a competitive counterpart (13 out of 40; 33%) pretended that they received negative outcomes, $\chi^2(2, N = 144) = 24.90$, $p < .01$. Likewise, for Cell zB, fewer people with a cooperative (4 out of 50; 8%) or an unknown (4 out of 54; 7%) counterpart than people with a competitive counterpart (9 out of 40; 23%) suggested they would receive negative outcomes, $\chi^2(2, N = 144) = 6.91$, $p < .05$.

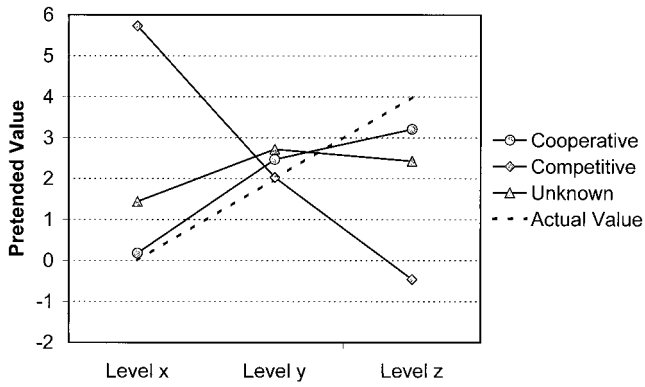

Figure 3. Information about the value of each level as a function of other's motivation, Experiment 1.

We then examined the number of participants suggesting their highest outcomes exceeded those of the other (i.e., Cells xA and xB of Table 1) as a function of other's motivation. For Cell xA, fewer people with a cooperative (4 out of 50; 8%) or an unknown (11 out of 54; 20%) counterpart than people with a competitive counterpart (18 out of 40; 45%) suggested their outcomes exceeded those of the other, $\chi^2(2, N = 144) = 17.54$, $p < .01$. Likewise, for Cell xB, fewer people with a cooperative (9 out of 50; 18%) or an unknown (14 out of 54; 26%) counterpart than people with a competitive counterpart (26 out of 40; 65%) suggested their outcomes exceeded those of the other, $\chi^2(2, N = 144) = 17.25$, $p < .01$.

All in all, these results support Hypothesis 2: When dealing with a competitive rather than a cooperative or an unknown counterpart, people are more likely to pretend that one's loss exceeds other's loss and that one's gains are bigger than those of the counterpart.

Discussion

As predicted in Hypothesis 1, participants were less accurate and more inaccurate with a competitive rather than a cooperative other. In line with Hypothesis 2, participants with a competitive

Table 3
Information Provided in Each Cell as a Function of Other's Motivation, Experiment 1

			Other's motivation					
	Total ($N = 143$)		Cooperative ($n = 53$)		Competitive ($n = 40$)		Unknown ($n = 50$)	
Level	Issue A	Issue B	Issue A	Issue B	Issue A	Issue B	Issue A	Issue B
x								
M	2.04	2.29	−0.24	0.60	5.83	5.63	1.46	1.42
SD	5.16	4.86	4.41	4.22	3.67	3.87	5.30	4.95
y								
M	2.75	2.11	3.06	1.89	2.05	2.00	3.00	2.44
SD	3.16	3.22	2.95	3.38	3.65	3.30	2.91	3.00
z								
M	2.29	1.53	4.25	2.17	−1.30	0.38	3.08	1.78
SD	4.93	3.77	3.64	3.74	5.32	4.23	4.31	3.24

other were also more likely to misrepresent their outcomes so that those appeared negative when the other got zero and higher than the other's outcome when the latter was positive. This misrepresentation may be strategically wise, because it may tempt the competitive other to make a decision that results in good rather than bad outcomes to the participant.

There were no significant effects for task structure. This suggests that participants in the incomplete-information condition assumed their outcomes were negatively correlated with those of their counterpart (i.e., the values they provided did not differ from those given in the zero-sum and the variable-sum conditions), which is consistent with negotiation studies showing that negotiators make a "fixed-pie assumption" (Thompson & Hastie, 1990). Although some authors have speculated that the fixed-pie-assumption may be confined to negotiation settings (e.g., Pruitt, 1990), our results suggest that the fixed-pie assumption is also made in the type of situations studied here. For our current purposes it is important that task structure had no effect on either the amount or the direction of deceit. In the following experiments, we therefore decided to focus on the zero-sum task.

Experiment 2

Although the results of Experiment 1 show that people are especially likely to use deception when dealing with a competitive other, it remains unclear why. In general, noncooperative behavior is predominantly motivated by greed, by fear of exploitation, or by both (Coombs, 1973). In the information provision game, both fear and greed play a role because the counterpart makes choices that boost or harm the participant's outcomes. In Experiment 1, we did indeed observe more deception toward a competitive rather than a cooperative other. This suggests that fear of exploitation is an important reason for misleading a competitive other. However, facing a competitive other in itself may elicit greed, and we need to examine whether fear, greed, or both can explain the tendency to mislead a competitive other.

Research into motives underlying punishment has suggested some additional reasons for lying and deception. Carlsmith, Darley, and Robinson (2002) distinguished between deterrence and just deserts as motives for punishing harm doers. *Deterrence* refers to the desire to prevent or curb future crimes and seems closely linked to fear of exploitation. The notion of *just deserts* refers to the desire to pay back harm doers for past crimes and appears to be conceptually unrelated to both fear and greed. The just deserts motive seems to play a role in social decision making. People who violate justice principles face sanctions, even by those whose outcomes are not affected by these violations (Fehr & Gächter, 2002; Folger & Skarlicki, 2001). People who have been deceived punish their counterpart even when this is costly (Boles et al., 2000). In the context of social dilemma research, Price, Cosmides, and Tooby (2002) reasoned that for collective action to evolve, some mechanism must eliminate the advantage free riders have over contributors. They proposed *punitive sentiment*, "a desire that the target of the sentiment is harmed" (p. 206), as an anti-free-rider device.

Altogether, three possible motivations—fear, greed, and punitive sentiment—may explain deception in the case of a competitive other. The goal of Experiment 2 was to examine which (combination of) motivation(s) explains the provision of accurate and inaccurate information to a competitive other. As in prior research on fear and greed (e.g., Bruins, Liebrand, & Wilke, 1989; Van Lange, Liebrand, & Kuhlman, 1990), the presence or absence of fear and greed was manipulated by making the other's decision either consequential or not for one's own outcomes. When the other's decision is consequential for one's own outcomes, lying and deception may be motivated by a desire to mislead the other into making decisions that benefit oneself the most (i.e., greed) or a desire to mislead the other into making decisions that damage one's own outcomes the least (i.e., fear). We used questionnaire items and mediation tests to examine whether the effects are due to fear, greed, or both. Similarly, the presence of punitive sentiment was manipulated by making the decision either consequential or not for the opponent's outcomes. When the decision has no consequences for the opponent's outcomes, lying and deception can hardly be motivated by punitive sentiment. Put differently, if more lying and deception are observed when the decision is consequential for the opponent's outcomes, then lying and deception are likely to be due to punitive sentiment. Again, we used questionnaire items and mediation tests to examine whether punitive sentiment explains possible effects.

Method

Participants and design. Seventy-seven students at the University of Amsterdam (38 women and 39 men) were randomly assigned to three experimental conditions in which the other's decision was consequential to the participant's outcomes only, to the opponent's outcomes only, or to both players' outcomes (note that the last condition is a replication of the task used in Experiment 1). Dependent variables were the provision of accurate and inaccurate information; self-reported fear, greed, and punitive sentiment; and manipulation checks. Participants received 15 guilders (approximately $6 US) for participation.

Procedure and independent variables. The procedure was the same as in the competitive-other condition in Experiment 1, with a few changes to manipulate whether or not the decision was consequential for the outcomes of the participant and the opponent. Whether the other's decision was consequential for the participant's or the opponent's outcome was manipulated independently by making the participant's own outcome and the opponent's outcome either relevant or irrelevant to one's chances of winning an attractive prize. We announced a lottery in which 3 participants would win a voucher of 50 guilders each (approximately $20 US), and one's chances of winning were either dependent on or independent of the outcome of the decision game. Depending on the experimental condition, participants were told either that each point gained in the decision game was worth one lottery ticket to themselves and/or the decision maker, or that the participant and/or the decision maker would get a random number (between 0 and 8) of lottery tickets regardless of the outcome of the decision game. Thus, in some conditions the outcome of the decision game had consequences for the participant's and/or the opponent's chances of winning additional cash, whereas in other conditions it had no consequences whatsoever. We further emphasized that only the information provider knew how lottery tickets could be obtained and that this information would not be shared with the decision maker. Consequently, the decision maker was believed to be unaware of the fact that his or her decision would affect his or her (and the participant's) chances of winning additional cash.

In the consequential-to-participant condition, the other's decision was consequential to the participant but not to the opponent. Participants were told that they would receive one lottery ticket for each point they gained in the decision game, whereas the opponent would receive a random number of tickets. In this condition, we assumed that both fear and greed would be relevant motives, whereas punitive sentiment would not. In the

consequential-to-opponent condition, the other's decision was consequential to the opponent but not to the participant. Participants were told that they would get a random number of lottery tickets, whereas the opponent would receive one lottery ticket for each point he or she gained in the decision game. In this condition, we assumed that punitive sentiment would be a relevant motive, unlike fear and greed. In the consequential-to-both condition, the other's decision was consequential to both players. Participants were told that they and the opponent would each receive one lottery ticket for each point gained in the decision game. In this condition, we assumed that fear, greed, and punitive sentiment would all be relevant motives.

Dependent measures. The measures for accurate information and inaccurate information were the same as in Experiment 1. Honesty ("I tried to be honest"), fear ("I tried to avoid being exploited"), greed ("I aimed to enhance my own outcome"), and punitive sentiment ("I wanted to teach the other a lesson") were all assessed on a 5-point scale (1 = *not at all*, 5 = *very much*). As a manipulation check, participants rated their impression of the other as in Experiment 1 and indicated how the lottery tickets were to be allocated to themselves (0 = *randomly*, 1 = *according to their outcome*) and to their opponent (0 = *randomly*, 1 = *according to his or her outcome*). Participants were then debriefed and paid.

Results

Manipulation checks. Nine participants answered one or both manipulation checks about the allocation of lottery tickets incorrectly and were excluded from the sample. All analyses are based on the remaining 68 participants. As intended, participants rated the other as competitive. Ratings were above the scale mean ($M = 4.40$, $SD = 0.74$), $t(67) = 15.66$, $p < .01$, and were not influenced by condition, $F(2, 65) < 1$.

Descriptive statistics. Table 4 shows that the desire to be honest was positively correlated with giving accurate information and negatively correlated with giving inaccurate information. Fear was positively correlated with giving inaccurate information and negatively correlated with giving accurate information. Greed was negatively correlated with giving accurate information and positively correlated with giving inaccurate information. Punitive sentiment was negatively correlated with giving accurate information and positively (but not significantly) correlated with giving inaccurate information. Finally, fear and greed were not correlated, but fear and punitive sentiment were moderately correlated.

Motives for lying and deception. To examine whether experimental condition influenced fear, greed, and punitive sentiment, we conducted three separate ANOVAs with condition as independent variable and motive as dependent variable. The effect of condition on fear was in the expected direction, $F(2, 65) = 3.06$, $p < .09$. When the decision was consequential for their outcome (i.e., in the consequential-to-participant and the consequential-to-both condition), participants indicated that fear was a motive because they answered above the scale mean: $M = 3.81$, $SD = 1.13$, $t(25) = 3.64$, $p < .01$, and $M = 3.84$, $SD = 1.17$, $t(18) = 3.15$, $p < .01$, respectively. When the decision was not consequential for their outcome (i.e., in the consequential-to-opponent condition), participants indicated less fear ($M = 3.17$, $SD = 1.50$) than in the other two conditions, $t(66) = 2.00$, $p < .05$.

A main effect of condition on greed showed that when the decision was consequential for their outcome (i.e., in the consequential-to-participant and the consequential-to-both condition), participants reported higher levels of greed ($M = 4.46$, $SD = 0.81$, and $M = 4.47$, $SD = 0.96$) than when it was not consequential for their outcome (i.e., in the consequential-to-opponent condition ($M = 2.96$, $SD = 1.93$), $F(2, 65) = 14.44$, $p < .01$. A Duncan test ($p < .05$) showed that the former two differed from the latter condition, but not from each other.

There was no main effect of condition on punitive sentiment, $F(2, 65) < 1$, *ns* (overall $M = 2.81$, $SD = 1.38$). Together, these results show that condition influenced fear and greed but not punitive sentiment. We return to this in the discussion section.

Provision of accurate and inaccurate information. The amount of accurate and inaccurate information was analyzed in a 3 (condition) × 2 (information: accurate vs. inaccurate) ANOVA with the last factor as a within-participants variable. A main effect of information showed that participants gave more inaccurate ($M = 4.10$, $SD = 1.98$) than accurate ($M = 1.07$, $SD = 1.54$) information, $F(1, 65) = 67.93$, $p < .01$. This makes sense, because in all conditions the other was competitive, and the means are indeed similar to those in the competitive-other condition of Experiment 1.

Results further revealed an interaction of information with condition, $F(2, 65) = 4.99$, $p < .01$. Table 5 shows that participants gave more accurate information and less inaccurate information when the decision was inconsequential rather than consequential for the participant's outcomes. Moreover, participants provided less accurate and more inaccurate information when the decision was consequential for both players' outcomes than when it was consequential only for the participant's outcomes. This is consistent with the idea that fear and greed motivate the provision of accurate and inaccurate information.

Tests for mediation. Experimental manipulations influenced fear and greed and the provision of accurate and inaccurate information. Because fear and greed were also correlated with the provision of accurate and inaccurate information, both fear and

Table 4
Means, Standard Deviations, and Correlations of the Main Dependent Variables in Experiment 2

Variable	*M*	*SD*	1	2	3	4	5	6
1. Honesty	2.02	1.11	—	−.20†	−.22†	−.01	.37**	−.38**
2. Fear of exploitation	3.60	1.29		—	.19	.38**	−.35**	.17
3. Greed	3.96	1.30			—	.04	−.47**	.45**
4. Punitive sentiment	2.81	1.38				—	−.25*	.18
5. Accurate information	1.07	1.54					—	−.74**
6. Inaccurate information	4.01	1.98						—

† $p < .10$. * $p < .05$. ** $p < .01$.

Table 5
Amount of Accurate and Inaccurate Information as a Function of Experimental Condition, Experiment 2

	Decision is consequential to		
Information	Opponent only	Participant only	Both
Accurate			
M	1.70_a	1.08_b	0.32_c
SD	1.87	1.49	0.58
Inaccurate			
M	3.39_a	4.04_b	5.05_c
SD	2.13	2.03	1.31

Note. Means within one row not sharing the same subscript differ at $p < .05$, according to Duncan *t* tests.

greed qualify as potential mediators between condition and the provision of accurate and inaccurate information. However, mediation also requires that the effect of the manipulations on the provision of accurate and inaccurate information is reduced when the mediator is taken into account and that the reduction in regression weight from simple to multiple regression is significant (Kenny, Kashy, & Bolger, 1998). To verify whether the additional requirements hold up for fear and greed, we performed two regression analyses per motive, one with accurate information and one with inaccurate information as dependent variable, each time using dummy-coded condition as the independent variable (dummy coded as 1 when the decision was consequential to the participants—i.e., the consequential-to-participant and the consequential-to-both condition—and as −2 when it was not consequential for the participant's outcome—i.e., the consequential-to-opponent condition). From the different approaches to establish mediation (e.g., MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), the Kenny et al. (1998) approach has been shown to be the most likely to miss real effects, but it is also very unlikely to commit a Type I error.

A regression analysis with the provision of accurate information as dependent variable, dummy-coded condition as independent variable, and fear as mediator revealed that the originally significant effect of condition ($\beta = -.29$), $t(66) = -2.47$, $p = .02$, dropped slightly ($\beta = -.22$), $t(66) = -1.89$, $p = .06$. The reduction in regression weight from simple to multiple regression was marginally significant according to Sobel test ($Z = -1.66$, $p < .10$). A similar regression analysis with the provision of inaccurate information as dependent variable revealed that the originally significant effect of condition ($\beta = .26$), $t(66) = 2.18$, $p = .03$, remained almost unaffected ($\beta = .23$), $t(66) = 1.88$, $p = .06$. Indeed, the reduction in regression weight from simple to multiple regression was not significant ($Z < 1$). Thus, results suggest that fear may partially mediate the effect of condition on the provision of accurate information and does not mediate the effect of condition on the provision of inaccurate information.

A regression analysis with provision of accurate information as dependent variable, dummy-coded condition as independent variable, and greed as mediator revealed that the originally significant effect of condition ($\beta = -.29$), $t(66) = -2.47$, $p = .02$, dropped substantially ($\beta = -.05$), $t(66) = -0.34$, *ns.* The reduction in regression weight from simple to multiple regression was significant according to Sobel test ($Z = -2.83$, $p < .01$). A similar regression analysis with the provision of inaccurate information as dependent variable revealed that the originally significant effect of condition ($\beta = .26$), $t(66) = 2.18$, $p = .03$, dropped substantially ($\beta = .02$), $t(66) = 0.11$, *ns.* The reduction in regression weight from simple to multiple regression was significant ($Z = 2.79$, $p = .01$). These results show that greed mediates the effects of condition on the provision of both accurate and inaccurate information.

Direction of deceit. The information provided in each of the six cells was submitted to a 3 (condition) × 2 (issue: A vs. B) × 3 (level: x vs. y vs. z) ANOVA, with the last two variables as within-participants factors. Question marks were regarded as missing data, which led to the exclusion of 14 participants. Results only revealed a main effect of level, $F(2, 40) = 10.71$, $p < .01$, showing that participants pretended that Level x was the most valuable ($M = 5.35$, $SD = 5.35$), that Level y was intermediate ($M = 1.28$, $SD = 3.54$), and that Level z was the least valuable ($M = -1.85$, $SD = 5.93$).

We examined the number of participants who pretended to get negative outcomes on Level z as a function of condition. For Issues A and B, condition had no effects, both $\chi^2(2, N = 68) < 1.37$, $ps > .50$. Consistent with the competitive-other condition of Experiment 1, 24 and 25 participants (35% and 37%) suggested they received negative outcomes in Cell zA and zB, respectively. We then examined the number of participants suggesting their outcomes exceeded those of the other on Level x (see Table 4). Again, for Issues A and B, condition had no effects, both $\chi^2(2, N = 68) < 4.40$, $ps > .12$. Consistent with the competitive-other condition of Experiment 1, 27 and 40 participants (40% and 59%) suggested their outcomes exceeded those of the other in Cells xA and xB, respectively. These results support Hypothesis 2, because they show that when dealing with a competitive other, people suggest that they receive negative outcomes when the other gets zero and that their positive outcomes exceed the others' positive outcomes.

Discussion of Experiment 2 and Introduction to Experiment 3

Experiment 2 showed that giving accurate information was mediated by greed and perhaps also by fear of exploitation. Giving inaccurate information was motivated by greed only. Punitive sentiment, though negatively correlated with accurate information, did not mediate the effects of experimental conditions. Measurement issues may account for the weak results regarding punitive sentiment. Indeed, single-item measures were used, and although meaningful correlations between these measures and with accurate and inaccurate information were found, it cannot be excluded that some measures were not very good.

Punitive sentiment may exist in some people more than in others: Selfish individuals who are concerned with own outcomes tolerate others who are selfish more than prosocial individuals who are concerned with fairness and collective welfare. Selfish individuals tend to behave noncooperatively, whereas prosocial individuals tend to trust others and approach them in a cooperative way (Pruitt & Kimmel, 1977; Van Lange, 1999). When the other is competitive, however, prosocial individuals tend to "overassimilate" and respond even more competitively than selfish individuals (e.g., Kelley & Stahelski, 1970; Van Lange, 1992). Overassimila-

tion may be based on punitive sentiment and the moralistic desire to "teach the other a lesson" (Price et al., 2002; Van Lange, 1992). In Experiment 2, punitive sentiment was indeed negatively correlated with the provision of accurate information.

Drawing a parallel with the overassimilation effect observed in social dilemmas, we thus hypothesize that compared with selfish individuals, prosocials will be more accurate toward a cooperative other and more inaccurate toward a competitive other—Hypothesis 3.

Initial evidence for this hypothesis comes from a negotiation study. O'Connor and Carnevale (1997) found more misrepresentation when both members of a negotiating dyad had a prosocial goal (i.e., maximize joint outcomes) rather than a selfish goal (i.e., maximize personal outcomes). However, because dyad members in this study received the same goal instructions, their findings may reflect (a) a main effect of the other's cooperative or competitive goals (our Hypothesis 1); (b) a main effect of the participant's prosocial versus selfish orientation (O'Connor & Carnevale's, 1997, hypothesis); or (c) an interaction between the participant's value orientation and the other's cooperative versus competitive goal (our Hypothesis 3).

Experiment 3

Method

Participants and design. One hundred fifty students (92 women and 58 men) at the University of Amsterdam participated and received 20 guilders (approximately $8 US). The design was a 2 (social value orientation: prosocial vs. selfish) × 3 (other's motivation: cooperative, competitive, unknown) between-participants factorial, with the information provided as main dependent variable.

Procedure and measurement of social value orientation. The procedure was the same as in Experiment 1, except that prior to the experiment we measured social value orientation using the decomposed game method developed by Kuhlman and Marshello (1975). This method has good construct validity (Van Lange, 1999), internal consistency (e.g., Liebrand & Van Run, 1985), and test–retest reliability (Kuhlman, Camac, & Cunha, 1986). In nine triple-dominance games, participants have to choose between Options A, B, and C. In one game, for example, Option A pays 550 points to oneself and 500 points to an unknown other, Option B pays 500 points to oneself and 100 points to the other, and Option C pays 500 points to both oneself and the unknown other. Option A represents the individualistic choice, because one receives more points (550) than in Options B or C (both 500 points). Option B represents the competitive choice, because it provides a greater advantage over the other's outcomes (500 − 100 = 400) than either Option A (550 − 300 = 250) or Option C (500 − 500 = 0). Finally, Option C corresponds to a prosocial choice because it provides equality and a larger joint outcome (500 + 500 = 1,000) than either Option A (550 + 300 = 850) or Option B (500 + 100 = 600).

Participants who made at least six consistent choices were classified as prosocial (n = 59; 39%), individualistic (n = 66; 44%), or competitive (n = 8; 5%). We excluded 17 unclassifiable participants (11%), who chose inconsistently. This distribution is consistent with earlier research (e.g., De Dreu & Van Lange, 1995; Liebrand & Van Run, 1985; Van Lange & Kuhlman, 1994). Following this work, we combined competitive and individualistic participants into a broader category labeled "selfish." After the decomposed game measure and a 10-min filler task, participants went on with the same procedure as in Experiment 1.

Dependent measures. Dependent measures were the same as in Experiment 1.

Results

Manipulation check. A 3 (other's motivation) × 2 (social value orientation) ANOVA showed that a competitive other was rated as significantly more competitive (M = 4.00, SD = 1.11) than both a cooperative (M = 2.63, SD = 1.23) and an unknown (M = 3.00, SD = 0.96) other, $F(2, 127) = 16.83$, $p < .01$. A Duncan test ($p < .05$) revealed that the latter two conditions differed from the first but not from each other.

Provision of accurate and inaccurate information. The amounts of accurate and inaccurate information were entered into a 3 (other's motivation) × 2 (social value orientation) × 2 (information: accurate vs. inaccurate) ANOVA, with the last factor within participants. A main effect for information showed that participants gave more inaccurate (M = 3.32, SD = 2.19) than accurate (M = 1.99, SD = 2.07) information, $F(1, 127) = 18.07$, $p < .01$. This effect was qualified by an interaction between information and other's motivation, $F(2, 127) = 16.63$, $p < .01$. As predicted in Hypothesis 1, participants gave least accurate and most inaccurate information to a competitive other, more accurate information to an unknown other, and most accurate and least inaccurate information to a cooperative other (see Table 6).

The predicted three-way interaction between information, other's motivation, and social value orientation, $F(2, 127) = 3.46$, $p < .05$, showed that compared with selfish participants, prosocial

Table 6
Amount of Accurate and Inaccurate Information as a Function of Social Value Orientation and Other's Motivation, Experiment 3

	Other's motivation					
	Prosocial			Selfish		
Information	Cooperative	Competitive	Unknown	Cooperative	Competitive	Unknown
Accurate						
M	3.90_{a}	0.50_{d}	1.82_{bc}	2.44_{b}	1.11_{c}	1.95_{bc}
SD	2.34	1.10	2.02	2.06	1.09	1.96
Inaccurate						
M	1.67_{d}	4.63_{a}	3.59_{abc}	2.89_{c}	4.22_{ab}	3.10_{bc}
SD	2.31	1.75	2.15	2.14	1.45	2.22

Note. Means within one row not sharing the same subscript differ at $p < .05$, according to Duncan t tests.

participants gave more accurate information to a cooperative other and less accurate information to a competitive other. Furthermore, compared with selfish participants, prosocial participants gave less inaccurate information to a cooperative other and, though not significantly so, more inaccurate information to a competitive other (means and standard deviations are shown in Table 6). These results support Hypothesis 3.

Direction of deceit. As in Experiment 1, we analyzed the information participants gave in the six cells in a 3 (other's motivation) × 2 (social value orientation) × 2 (Issue A vs. Issue B) × 3 (Level x vs. y vs. z) ANOVA with the last two factors within participants. Question marks were treated as missing values, which led to the exclusion of 40 participants.

A main effect of issue showed that participants correctly stated that they got more points on Issue A than on Issue B ($M = 1.87$, $SD = 2.70$ vs. $M = 0.68$, $SD = 2.33$), $F(1, 87) = 49.24$, $p < .01$. As in Experiment 1, an interaction between issue and level, $F(2, 174) = 3.75$, $p < .01$, showed that participants accurately stated that Cell zA was worth more than Cell zB, $t(92) = 5.45$, $p < .01$, and that Cell yA was worth more than Cell yB, $t(92) = 5.67$, $p < .01$, but that Cell xA was worth just as little as Cell xB, $t(92) = 0.85$, *ns.* Means and standard deviations are shown in Table 7.

An interaction between level and other's motivation, $F(6, 174) = 17.59$, $p < .01$, indicated that on Levels x, y, and z, respectively, the information given to cooperative others increased from $M_x = -2.01$ to $M_y = 1.20$ to $M_z = 2.79$. The information given to competitive others, however, decreased from $M_x = 5.70$ to $M_y = 1.32$ to $M_z = -2.14$ (*SD*s are 4.68, 1.93, and 2.34; and 4.63, 4.12, 5.03, respectively). This pattern is very similar to the one found in Experiment 1 (see Figure 3) and provides additional support for Hypothesis 2.

An interaction between issue, level, and other's motivation further qualifies this finding, $F(4, 174) = 9.82$, $p < .01$. Means are shown in Table 7. With cooperative or unknown others, participants truthfully stated that Level z was of a high value and that Cell zA was of higher value than Cell zB, $t(37) = 9.28$, $p < .01$, and $t(26) = 2.68$, $p < .02$, for the cooperative and unknown other conditions, respectively. With competitive others, however, participants pretended that Level z was of a low value, with Cell zA not differing from Cell zB, $t(27) = 0.32$, *ns,* and that Level x was of high value, with Cell xA being more valuable than Cell xB, $t(27) = 5.49$, $p < .01$.

We also examined the number of participants who pretended to get negative outcomes on Level z as a function of other's motivation and social value orientation. For Cell zA, a logistic regression with other's motivation, social value orientation, and their interaction as independent variables only showed a significant effect of other's motivation ($B = 3.21$, $p < .01$). Fewer people with a cooperative (1 out of 48; 2%) or an unknown (3 out of 42; 7%) counterpart than people with a competitive counterpart (15 out of 43; 35%) suggested they received negative outcomes. A similar pattern was found for Cell zB ($B = 2.28$, $p < .01$): Fewer people with a cooperative (3 out of 48; 6%) or an unknown (3 out of 42; 7%) counterpart than people with a competitive counterpart (17 out of 43; 40%) suggested they received negative outcomes.

We finally examined the number of participants suggesting their outcomes exceeded those of the other on Level x (see Table 1) as a function of other's motivation and social value orientation. For Cell xA, logistic regression only showed a significant effect for other's motivation ($B = 3.94$, $p < .02$). Fewer people with a cooperative (1 out of 48; 2%) or an unknown (9 out of 42; 21%) counterpart than people with a competitive counterpart (21 out of 43; 49%) suggested their outcomes exceeded those of the other. A similar pattern was found for Cell xB ($B = 3.27$, $p < .01$): Fewer people with a cooperative (2 out of 48; 4%) or an unknown (11 out of 42; 26%) counterpart than people with a competitive counterpart (23 out of 43; 54%) suggested their outcomes exceeded those of the other.

All in all, these results provide new support for Hypothesis 2: People with a competitive counterpart are more likely to misrepresent their outcomes as negative when the other gets zero and as exceeding the other's positive outcomes. Social value orientation did not qualify this general pattern.

Discussion of Experiment 3 and Introduction of Experiment 4

Experiment 3 replicates and extends Experiments 1 and 2. As predicted in Hypothesis 1, we found that individuals with a cooperative other were most likely to give accurate information and

Table 7
Information Provided in Each Cell as a Function of Other's Motivation, Experiment 3

			Other's motivation					
	Total ($N = 93$)		Cooperative ($n = 38$)		Competitive ($n = 28$)		Unknown ($n = 27$)	
Level	Issue A	Issue B	Issue A	Issue B	Issue A	Issue B	Issue A	Issue B
x								
M	1.31	0.95	−2.68	−1.34	7.03	4.36	1.00	0.63
SD	7.04	5.69	5.87	4.67	4.58	4.52	6.78	6.48
y								
M	1.89	0.78	1.97	0.42	1.57	1.07	2.11	1.00
SD	3.02	2.57	2.32	1.65	4.61	3.91	1.55	1.82
z								
M	2.42	0.31	4.39	1.18	−2.04	−2.25	4.26	1.74
SD	5.57	4.12	3.05	1.98	6.04	4.53	5.32	4.78

least likely to give inaccurate information, whereas the reverse holds for individuals with a competitive other. As predicted in Hypothesis 3, and indicative of an overassimilation effect, this pattern was stronger for prosocial than for selfish individuals.

Results for the direction of deceit once again supported Hypothesis 2. Individuals with a cooperative other truthfully presented the situation as involving opposed interests, whereas individuals with a competitive other misrepresented their outcomes as negative when the other's outcome was zero and as exceeding the other's outcomes when these were positive. Social value orientation did not influence this pattern, suggesting that prosocial and selfish individuals do not differ in their strategic misrepresentation.

Because the information provision game is abstract and context free, the reader may wonder whether behavior in this game is informative about strategic misrepresentation in daily settings. In Experiment 4 we replicated Experiment 3 in a different setting with a different scenario (i.e., the sale of one's used car) and tested Hypotheses 1 and 3 once again. Second, because the use of psychology undergraduates in the first three experiments could be seen as a limitation, we sampled participants from the general population in Experiment 4.

Experiment 4

Method

Experimenters, participants, and design. Five graduate-level psychology students at the University of Amsterdam addressed people at random in a busy marketplace and on a commuter train and asked them to fill out a questionnaire in return for a chance of winning €20 in a lottery (approximately $18 US). About 40% of the people approached participated (N = 179). The most frequently mentioned reasons not to participate were not being able to read Dutch or having no time. Fifty-seven percent (n = 101) of the participants were men, and the mean age was 25 (range between 19 and 59). Although 18% (n = 33) were not of Dutch nationality, all participants were fluent in Dutch. Participants were assigned at random to one of the three conditions (other's motivation: competitive, cooperative, or unknown). Social value orientation was included as a post hoc blocking factor. Main dependent variables were the likelihood of presenting accurate and inaccurate information.

Procedure and materials. Participants were asked to fill out a questionnaire about "decision making while purchasing goods and services." To provide the participants with some privacy but to still be able to assist should something be unclear, the experimenters left them alone for a while but remained nearby. After about 10–15 min, the experimenter collected the materials, explained the purpose of the study, and separately wrote down the participant's name and address for the lottery.

The questionnaire began with an assessment of social value orientation using a paper-and-pencil version of the decomposed game method used in Experiment 3. Twenty-eight percent of the participants (n = 51) were prosocially motivated, 17% (n = 30) were competitively motivated, 42% (n = 75) were individualistically motivated, and 13% (n = 23) could not be classified. The relatively low percentage of prosocials (28%) is not inconsistent with previous research (e.g., De Dreu & McCusker, 1997; Dehue, McClintock, & Liebrand, 1993) and does not suggest a preponderance of helpful people with a prosocial orientation. As in Experiment 3, we combined competitive and individualistic motivations into the overarching category "selfish."

Participants then imagined that they would try to sell their car. They read an advertisement they had allegedly placed in the newspaper (i.e., information available to the buyer as well) and were given some information about the car that was not mentioned in the advertisement (i.e., not available to the buyer) and created opportunity for deception and misrepresentation. They read that because the odometer had been replaced, the actual mileage of the car was higher than displayed on the new odometer, that the gearshift was working but would have to be replaced soon, that they did not care for the radio and intended to leave it in the car, and that they wanted to keep the car for a few more weeks before actually selling it.

Manipulation of other's motivation. Participants were asked to imagine meeting a prospective buyer they recollected from a party some time ago, who himself (all scenarios involved a male buyer), however, would not recognize them. In the cooperative-other condition, they read that they remembered the buyer as a pleasant and warm person who was interested in other people and seemed to care about other people's well-being. In the competitive-other condition, participants read that they remembered him as an unpleasant and cold person who was interested only in himself and did not appear to care about other people's well-being at all. In the unknown-other condition, participants read that though they remembered having met the person before, they could not remember any details about him.

Dependent variables. Participants read four brief scenarios. In each scenario, the buyer inquires about a feature he was unaware of prior to the meeting. Participants rated the likelihood (1 = *very unlikely*, 5 = *very likely*) of providing accurate information and of reacting with an active lie. In the first scenario, the buyer mentions the mileage. Participants rated the likelihood of telling the buyer that (a) the odometer had been replaced and the actual mileage was higher (*first accurate information*) and (b) the mileage, though indeed low, was correct (*first active lying*). In the second scenario, the buyer inquires about the condition of the gearshift. Participants rated the likelihood of telling the buyer that (a) the gearshift needed to be replaced soon (*second accurate information*) and (b) the gearshift was fine (*second active lying*). In the third scenario, the buyer asks if he could buy the radio. Participants rated the likelihood of telling the buyer that (a) the radio would stay in the car anyway (*third accurate information*) and (b) he would have to pay a higher price for it (*third active lying*). In the fourth scenario, the buyer asks if he could take over the car not earlier than 1 month from the date of purchase. Participants rated the likelihood of saying (a) that they actually preferred to keep the car for 1 more month (*fourth accurate information*) and (b) that keeping it was problematic and the buyer should pay more in return (*fourth active lying*).

Having indicated their responses to the four scenarios, respondents rated the other party's competitiveness. In several instruction checks, crucial aspects of the scenarios were repeated and participants were asked to indicate whether the statement was true or false. Finally, age, gender, and nationality were requested, and, to control for negotiation experience, participants were asked how often they negotiated at work (1 = *hardly ever*, 5 = *very often*) and how often they had sold a car in the past 10 years.

Results

Treatment of the data and manipulation checks. Seven respondents had to be removed from the sample because of missing values, 13 others were removed because they answered one or more instruction checks incorrectly, and another 23 respondents were removed because they could not be classified as either prosocial or selfish. All analyses were based on the data of 136 participants. Demographic variables had no effects whatsoever.

A 3 (other's motivation) × 2 (social value orientation) ANOVA showed that the buyer was seen as more cooperative in the cooperative-other (M = 1.95, SD = 0.97) than in the competitive-other (M = 2.52, SD = 1.31) condition, $F(2, 127) = 4.15$, $p < .02$. In the unknown-other condition, ratings were intermediate (M = 2.12, SD = 0.87) and did not differ from the other conditions according to a Duncan test ($p < .05$). A main effect of social value orientation showed that prosocial participants rated the buyer as

more cooperative ($M = 2.67$, $SD = 1.20$) than did selfish participants ($M = 2.00$, $SD = 0.96$), $F(1, 127) = 13.22$, $p < .01$.

Provision of accurate and inaccurate information. Providing accurate information and active lying were entered as dependent variables into a 3 (other's motivation) × 2 (social value orientation) × 4 (scenario) × 2 (information: accurate information vs. active lying) ANOVA. A main effect of the within-participants factor information revealed that overall, participants thought they were more likely to provide accurate information than to engage in active lying ($M = 3.16$, $SD = 1.02$ vs. $M = 2.37$, $SD = 0.87$); $F(1, 130) = 27.40$, $p < .01$. A main effect of scenario, $F(3, 128) = 26.51$, and an interaction of scenario with information, $F(3, 128) = 9.22$ (both ps $< .01$), indicated that in the third scenario (selling the radio instead of giving it away), both active lying and providing accurate information were rated as more likely than in the other scenarios and that in the fourth scenario (charging money for handing the car over some weeks later), lying was rated more likely than in the other three scenarios.

Of greater theoretical importance is the interaction between information and other's motivation, $F(2, 130) = 18.89$, $p < .01$. Participants rated themselves more likely to give accurate information to a cooperative than to a competitive other ($M = 3.59$, $SD = 0.97$ vs. $M = 2.58$, $SD = 0.81$), $t(82) = 5.19$, $p < .01$, with an unknown other in between ($M = 3.24$, $SD = 0.98$). Participants also rated themselves more likely to lie to a competitive than a cooperative buyer ($M = 2.79$, $SD = 0.95$ vs. $M = 2.02$, $SD = 0.59$), $t(68) = -4.45$, $p < .01$, with an unknown buyer falling in between ($M = 2.36$, $SD = 0.87$). This pattern of results supports Hypothesis 1 and validates the results of Experiments 1–3.

Finally, we found an interaction between information, social value orientation, and other's motivation, $F(2, 130) = 5.90$, $p < .01$. Table 8 shows that collapsed over scenario, prosocial individuals gave more accurate information to a cooperative buyer than did selfish individuals. To a competitive buyer, however, prosocial individuals gave less accurate information than did selfish individuals. This effect reflects the overassimilation effect predicted in Hypothesis 3 and validates the findings of Experiment 3. Prosocial and selfish individuals did not differ in their behavior toward an unknown buyer.

General Discussion

In this study, we developed and used the information provision game to examine when, how, and why people engage in deception and strategic misrepresentation in social decision making. In a nutshell, our results show that (a) individuals engage in more lying and deception when dealing with a competitive rather than a cooperative counterpart; (b) deception is positively correlated with fear of exploitation and with greed, whereas withholding accurate information is positively correlated with fear of exploitation, greed, and punitive sentiment; (c) individuals deceive a competitive other out of greed and withhold accurate information out of fear of exploitation and greed; (d) compared with selfish individuals, those with a prosocial orientation are more honest toward a cooperative other and more deceitful toward a competitive other; and (e) regardless of their social value orientation, individuals deceive a competitive other so that their gains and losses appear bigger than other's gains and losses, respectively.

Theoretical Implications

Our focus on motives underlying strategic misrepresentation was inspired by goal expectation theory (Pruitt & Kimmel, 1977) and interdependence theory (Kelley & Thibaut, 1978; Rusbult & Van Lange, 1996, 2003). Both theories largely focus on cooperative and competitive choice behavior in the context of classic experimental games like the prisoner's dilemma game (for extensions to other situations such as negotiation and close relationships, see, e.g., De Dreu & Van Lange, 1995; Van Lange, Agnew, Harinck, & Steemers, 1997). The key prediction is that individuals become cooperative when they have cooperative goals and expect their counterpart to have cooperative goals too. Our results are consistent with this general prediction and extend the theory to the domain of lying and deception. That is, on the basis of our experimental results we can conclude that compared with selfish individuals, prosocial individuals provide more truthful information when their counterpart is cooperative. Consistent with the overassimilation effect (Kelley & Stahelski, 1970; Van Lange, 1992), prosocial individuals also provide more inaccurate information than selfish ones when the counterpart is competitive. This

Table 8
Amount of Accurate and Inaccurate Information as a Function of Social Value Orientation and Other's Motivation, Experiment 4

	Other's motivation					
	Prosocial			Selfish		
Information	Cooperative ($n = 11$)	Competitive ($n = 11$)	Unknown ($n = 17$)	Cooperative ($n = 31$)	Competitive ($n = 31$)	Unknown ($n = 35$)
Accurate						
M	4.02_{d}	2.11_{a}	3.50_{cd}	3.44_{cd}	2.74_{b}	3.11_{bc}
SD	0.89	0.90	0.85	0.97	0.71	1.02
Inaccurate						
M	2.02_{a}	3.23_{c}	1.88_{a}	2.02_{a}	2.64_{b}	2.59_{b}
SD	0.49	0.93	0.71	0.63	0.92	0.86

Note. Means within one row not sharing the same subscript differ at $p < .05$, according to Duncan t tests.

set of results indicates that some key features of goal-expectation and interdependence theory also apply to other types of behavior besides only cooperative and noncooperative choices.

Consistent with both goal expectation theory and interdependence theory, we obtained strong evidence that deceiving a competitive other is motivated by a desire to do better oneself (greed) and some evidence that it is partially mediated by fear of exploitation (marginally significant). It is interesting to note that greed mediated withholding accurate information as well as giving inaccurate information. Fear, in contrast, appeared to motivate only withholding accurate information and was not related to giving inaccurate information. In other words, our results suggest that greed motivates a reduction in cooperative behavior and an increase in competitive behavior, whereas fear only motivates a reduction in cooperative behavior. This may indicate that fear of exploitation activates avoidance tendencies and a desire to escape the situation, whereas greed activates approach tendencies. This seems intuitively appealing, but research is needed to examine this issue. Also, this result suggests that being honest and being deceitful are not the endpoints of one and the same continuum. Rather, they appear to be different types of behavior that can be motivated by the same or by different goals.

Taking account of recent theory and research, we proposed punitive sentiment as a third possible motive underlying deception (Price et al., 2002; see also Fehr & Gächter, 2002; Folger & Skarlicki, 2001). In Experiment 2, we found that lying and deception were positively correlated with punitive sentiment, but we were unsuccessful in inducing various levels of punitive sentiment. However, Experiments 3 and 4 revealed the so-called overassimilation effect, that is, the tendency for prosocial individuals to be even more competitive (i.e., deceitful) toward competitive others than selfish individuals are (Kelley & Stahelski, 1970; Van Lange, 1992). The overassimilation effect is usually explained by arguing that prosocial individuals try to teach the competitive other a lesson, an explanation strongly compatible with the punitive sentiment motive studied in Experiment 2. Results could have been stronger—the test for mediation in Experiment 2 failed, the construct was measured with one item only, and the measure was not included in Experiments 3 and 4. Nevertheless, results suggest that lying and deception can be motivated by the desire to punish the other for observed or expected wrongdoing. Future research could examine this issue in more detail.

In past work on strategic misrepresentation (e.g., Boles et al., 2000; Murnighan et al., 1999; Schweitzer & Croson, 1999), decision makers are often assumed to be motivated to maximize own profit (e.g., Boles et al., 2000; Kagel & Roth, 1995). Current findings contradict this assumption at least to some extent in that they show that lying and deception are influenced by social value orientation as well as by other's cooperative or competitive motivation. The influence of social value orientation indicates that individuals are motivated by other considerations than their immediate self-interest (for a discussion, see Rusbult & Van Lange, 1996). The influence of the other's cooperative or competitive motivation is particularly troublesome for the behavioral decision approach, because self-interest dictates as much misrepresentation when the other is cooperative as when the other is competitive. Immediate self-interest cannot explain why individuals in a one-shot mixed-motive situation are open and honest when they believe their counterpart is cooperative (see also Paese & Gilin, 2000).

In contrast to previous research on lying and deception in social decision making, the current study allowed us not only to examine the extent to which individuals misrepresent their preferences and priorities but also the direction in which they try to mislead their counterpart. Experiments 1 and 3 showed that when dealing with a cooperative other, participants provided information that (accurately) indicated they and their counterpart were in an opposed-interest situation. Perhaps facing a cooperative other triggers a cooperative mind-set that directs the participant toward honesty and cooperative behavior (Burnham et al., 2000). This results in the provision of accurate information and, by default, in a description of the situation as one involving opposed interests.

When dealing with a competitive other, participants (inaccurately) indicated that their own outcomes were negative when the other got zero and higher than the other's outcomes when these were positive (see also Figure 3). Indeed, given that the other pursues a competitive goal and seeks to maximize relative advantage, the smart choice is to suggest that one's loss is bigger than the other's loss and that one's gain exceeds the other's gain. If this misrepresentation is successful, and if the other does indeed seek relative advantage, he or she should accept the loss because this will apparently give him or her a relative advantage (choosing the gain instead will apparently give him or her a relative disadvantage). If the misrepresentation is unsuccessful, the competitive counterpart will most likely choose the gain, something the counterpart would have done anyway had the participant provided accurate information.

The Information Provision Game

Our conclusions largely derive from the newly developed information provision game. The game was modeled after the dictator game (Camerer & Thaler, 1995, Van Dijk & Vermunt, 2000) and resembles the social interaction situation where one party has to decide whether to provide the other with information about one's preferences and priorities. The game allowed us to examine both the amount and direction of deceit. This is, we believe, an important advance over earlier studies on lying and deception, which were only able to code whether lying or deception occurred or not.

Two questions require an answer. First, the reader may wonder whether findings obtained by means of this new game generalize to other settings. We believe they do, because the findings of Experiment 3 were replicated in Experiment 4 with a more conventional paradigm. Results were also consistent with studies using face-to-face negotiation tasks (e.g., Murnighan et al., 1999; O'Connor & Carnevale, 1997). Second, one could argue that participants could easily guess the hypotheses and try to conform to the experimenter's expectations. Although demand characteristics may explain some of the results, it is unlikely that participants accurately anticipated the overassimilation effect found in Experiments 3 and 4. It seems equally unlikely that participants guessed our hypothesis about the direction of deceit, which was confirmed in Experiments 1–3. Nevertheless, some features of the information provision game may have facilitated deception. The setting rules out negative long-term effects of lying (cf. Boles et al., 2000), participants do not have to fear that others may detect their lies by noticing telltale incongruous facial expressions (Drolet &

Morris, 2000), and participants could see their lack of decision power as a justification for lying (Deutsch, 2000). Obviously, these features may affect the overall base rate of deception but not the specific effects of the experimental manipulations. The fact that we replicated the key findings of Experiments 1 and 3 with a more traditional methodology in Experiment 4 suggests that the effects of the experimental manipulations are valid and reliable. Moreover, the features just noted can be easily altered, for example to study lying and deception as a function of visual access, decision power, concern for long-term relationships, or concern with reputation.

Summary and Conclusions

Most work on lying and deception has been concerned with the human ability or inability to convincingly deceive others (e.g., DePaulo et al., 2003; Vrij et al., 2001). This study approached deception from a different angle and examined when and why people engage in deception and strategic misrepresentation. Two main conclusions can be drawn. First, individuals are less honest and engage in more deception when their counterpart is competitive rather than cooperative. This tendency is due to greed and perhaps to fear of exploitation and is stronger for prosocial than for selfish individuals. Second, individuals facing a competitive other engage in sophisticated forms of strategic misrepresentation that may trick competitive others into doing exactly the opposite of what they want—they will end up curtailing their own outcomes and helping the participant to get better outcomes.

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