

Do Not Prime Hawks With Doves: The Interplay of Construct Activation and Consistency of Social Value Orientation on Cooperative Behavior

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Low and high consistent pro-socials and pro-selfs were primed with neutral, morality, or might concepts in mixed-motive situations. The authors expected participants' social value orientation to influence cooperative behavior among (a) high consistent individuals in all prime conditions and (b) low consistent individuals in the neutral prime condition only. The authors also expected the primes to influence cooperative behavior more among low than high consistent individuals. Four experiments using supra-liminal (Experiments 1, 2, and 4) or subliminal (Experiment 3) priming and 2-person (Experiments 1–3) or *N*-person (Experiment 4) social dilemmas partially supported these initial predictions. One intriguing exception was that morality primes reduced cooperation among high consistent pro-selfs. Experiments 2–4 allowed testing for the potential role of expectations in shaping participants' cooperative behavior.

In interdependence dilemmas, individuals are faced with a conflicting choice between the collective interest and self-interest. Individuals' outcomes in these dilemmas do not only depend on their own choices but also on the choices of others. An individual is often tempted to make a noncooperative, self-interested choice because it yields higher personal outcomes than a cooperative, collectively interested choice, irrespective of what others might do.

However, if all interested parties choose to pursue their self-interests, they are all worse off than if they had acted in a cooperative manner (Dawes, 1980). Therefore, mutual cooperative behavior is better for all parties than mutual defection.

An abundant stream of research has demonstrated that *social value orientation* (i.e., a specific preference for various own–other outcome distributions; McClintock, 1972; Messick & McClintock, 1968) strongly influences cooperative behavior in mixed-motive situations (e.g., Kramer, McClintock, & Messick, 1986; Van Lange & Liebrand, 1989; Van Vugt, Meertens, & Van Lange, 1995). Some other research, however, has demonstrated that cooperative behavior could also be influenced by subtle situational cues such as primes (e.g., Hertel & Fiedler, 1994, 1998). These could even override the influence of social value orientation, which is often assumed to be a stable disposition (Dehue, McClintock, & Liebrand, 1993; Kuhlman, Camac, & Cunha, 1986; McClintock, 1972). According to Van Lange (2000; Van Lange, Agnew, Harinck, & Steemers, 1997), cooperative behavior in mixed-motive interdependence situations is best predicted by a Disposition \times Situation interaction, such that the influence of social value orientation on cooperative behavior should be larger in situations lacking relevant situational cues than in situations with relevant, even subtle, situational cues (such as primes).

Our objective was to extend and test this perspective. We predicted that the specific Disposition \times Situation data pattern would depend on the consistency of one's social value orientation. Hertel and Fiedler (1998) showed that individuals with a high

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consistent social value orientation are less susceptible to priming influences than individuals with a low consistent social value orientation. We tested our view by unobtrusively confronting our participants with either morality-trait primes or with might-trait primes.

Dispositional Influences on Cooperative Behavior: The Role of Social Value Orientation

A dispositional variable that has received substantial attention in many studies on cooperative behavior in mixed-motive situations is social value orientation. Typically, three kinds of orientations have been identified (derived from, among others, Allison & Messick, 1990; Griesinger & Livingston, 1973; MacCrimmon & Messick, 1976; McClintock, 1972; Messick & McClintock, 1968): (a) a *pro-social orientation* (i.e., maximizing joint outcomes and maximizing equality in outcomes; see Van Lange, 1999), (b) an *individualistic orientation* (i.e., maximizing own outcomes with little or no consideration about others' outcomes), and (c) a *competitive orientation* (i.e., maximizing own outcomes relative to others' outcomes). The latter two orientations are often combined as a group of pro-self orientations because they are both oriented toward maximizing own outcomes either in an absolute manner (individualism) or in a relative manner (competition; see Van Lange & Liebrand, 1989, 1991a, 1991b).

Social value orientation has been found to reliably predict cooperative behavior in all kinds of mixed-motive situations (e.g., De Dreu & Van Lange, 1995; Kramer et al., 1986; Kuhlman & Marshello, 1975; Liebrand & Van Run, 1985; McClintock & Allison, 1989; Van Lange & Liebrand, 1989; Van Vugt et al., 1995). Individuals with a pro-social orientation (called *pro-socials*) always tend to behave more cooperatively than individuals with a pro-self orientation (called *pro-selfs*).

Social value orientation is not only linked to differences in behavior but also to differences in how the behavior of others is perceived. Pro-socials tend to judge another person's behavior in terms of morality: Someone who behaves in a cooperative manner will be judged as a moral and honest person, whereas someone who behaves in a noncooperative manner will be judged as immoral and dishonest. Pro-selfs tend to judge another person's behavior more in terms of might-competence: Someone who acts cooperatively will be judged as weak and unintelligent, whereas someone who acts noncooperatively will be judged as strong and competent. This difference in the way pro-socials versus pro-selfs judge other individuals' behavior is called the *might-versus-morality* phenomenon (e.g., Liebrand, Jansen, Rijken, & Suhre, 1986; McClintock & Liebrand, 1988; Sattler & Kerr, 1991; Van Lange & Kuhlman, 1994).

Situational Influences on Cooperative Behavior: The Role of Primes

Cooperative behavior may also be contingent on situation-specific cues such as personality information about the partner (De Bruin & Van Lange, 1999) or specific features of an interpersonal-relationship-like level of commitment or satisfaction (e.g., Van Lange, Rusbult, et al., 1997; Wieselquist, Rusbult, Foster, & Agnew, 1999). However, research has demonstrated that cooperative behavior might also become influenced by more subtle

situational influences such as priming (Herr, 1986; Hertel & Fiedler, 1994, 1998; Hertel & Kerr, 2001; Neuberg, 1988). For instance, priming with adjectives related to morality made individuals behave more cooperatively in a dilemma game than did priming with adjectives related to might (Hertel & Fiedler, 1994).

In the social psychological literature, priming has already proved to have powerful influences on individuals' perceptions and behavior. When a person is ambiguously described, primed knowledge can be used to disambiguate the blurry impression of this person. Higgins, Rholes, and Jones (1997) demonstrated that priming participants with either positive or negative traits caused impressions of an ambiguously described target person to shift in a trait-consistent manner without the participants being aware of the influence (for other demonstrations, see Bargh & Pietromonaco, 1982; Bargh & Thein, 1985; for reviews, see Bargh, 1994; Wyer & Srull, 1989). Furthermore, priming traits and stereotypes has also been found to affect individuals' behavior. Bargh, Chen, and Burrows (1996) demonstrated that participants primed with traits related to rudeness interrupted a conversation much faster than participants primed with traits related to politeness. Participants primed with an elderly stereotype walked more slowly down a hallway than control participants (Bargh et al., 1996). Many other studies corroborated these automatic priming effects on behavior (e.g., Dijksterhuis, Aarts, Bargh, & Van Knippenberg, 2000; Dijksterhuis & Corneille, 2001; Dijksterhuis & Van Knippenberg, 1998; for reviews, see Bargh & Ferguson, 2000; Dijksterhuis & Bargh, 2001; Wheeler & Petty, 2001). Priming effects on behavior are often explained via associative links between mentally represented concepts, such as traits and stereotypes, and behavioral responses (Bargh et al., 1996; Dijksterhuis et al., 2000; for a more detailed discussion of priming mechanisms, see Bargh, 1997; Bargh & Ferguson, 2000; Wheeler & Petty, 2001).

If behavioral responses to situations are represented mentally, the mere occurrence of relevant situational cues could automatically activate the representation of these behavioral responses (Bargh et al., 1996). Therefore, we believe that cooperative behavioral responses could also become automatically activated by relevant situational cues. Indeed, because participants regularly encounter situations of noncorrespondent outcomes, cooperative or noncooperative behavior may become automatically associated with situational cues (Van Lange, 2000; Van Lange, Rusbult, et al., 1997; Wieselquist et al., 1999). Because morality is strongly associated with cooperative behavioral responses and might with noncooperative behavioral responses (Liebrand et al., 1986; Sattler & Kerr, 1991), priming the concept of morality should enhance cooperative behavior, and priming the concept of might should enhance noncooperative behavior.¹

¹ Recently, Utz, Ouwerkerk, and Van Lange (2001) argued that priming competence, which is an aspect of might, could have different associations for noncompetitive and competitive individuals. A competence prime was assumed to elicit cooperative behavior for noncompetitive individuals and noncooperative behavior for competitive individuals. The interest of our research, however, was to prime might rather than competence. Might is a much broader concept, of which competence is just one aspect; might also involves aspects like power and potency. As indicated by previous research (Liebrand et al., 1986; Sattler & Kerr, 1991), might is associated with noncooperative behavioral responses.

The Combined Role of Social Value Orientation and Primes

To be sure, one should not expect behavior to be influenced in an additive manner by individuals' social value orientation or primes. Indeed, Van Lange (2000) argued that it would be dysfunctional for individuals to always approach interdependent others in the same manner. He suggested that social value orientation should only have a sizeable influence in ambiguous situations. Because mixed-motive situations are ambiguous by definition, lacking relevant cues to guide cooperative behavior, dispositional influences should likely affect social interaction. However, relevant situational influences such as primes may disambiguate situations by activating preferences and behavioral responses associated with the primes. Under such circumstances, dispositional influences should be weaker and, instead, individuals should be more susceptible to situational influences.²

Thus, comparing ambiguous with disambiguated situations, one should expect a Disposition \times Situation data pattern to emerge (Van Lange, 2000; see also Van Lange, Agnew, et al., 1997), with stronger influences of social value orientation in a neutral priming condition (i.e., the ambiguous situation) than in conditions with relevant situational influences such as morality or might primes (i.e., disambiguated situations).

Individual Differences in Susceptibility to Priming: The Role of Consistency of Social Value Orientation

In a recent study, Hertel and Fiedler (1998) argued that susceptibility to priming in mixed-motive situations may well depend on the consistency of one's social value orientation. Participants were confronted with morality-related trait primes and might-related trait primes. The effect of priming was assessed on allocation behavior in the Ring Measure of Social Values (Ring Measure; Liebrand, 1984). The Ring Measure assesses a person's social value orientation and the consistency of that social value orientation (e.g., Liebrand, 1984; Liebrand & McClintock, 1988). This measure is a computerized technique presenting individuals a series of decision trials, with each trial consisting of a pair of options describing different allocations of gains or losses to the self versus another person. Individuals have to indicate on each trial which distribution they prefer. A maximal consistency score is obtained when the participant's preferred orientation on the Ring Measure remains consistent across all trials (Liebrand, 1984). This score decreases when participants follow another orientation on some trials. Hertel and Fiedler (1998) argued that consistency of choices in the Ring Measure refers to the strength of each individual's social value orientation, with a *high consistent* social value orientation (i.e., a social value orientation with a high consistency score) reflecting a stronger disposition than a *low consistent* social value orientation (i.e., a social value orientation with a lower consistency score).

Hertel and Fiedler (1998) found that only low consistent individuals were highly susceptible to the primes. Specifically, the behavior of these individuals assimilated to the primes, with more cooperative decisions in conditions with morality-related trait primes and less cooperative decisions in conditions with might-related trait primes. Hertel and Fiedler (1998) argued that a low consistent individual's social value orientation is not strong

enough to resist priming influences. High consistent individuals were less influenced by the priming procedure, supposedly because in their case priming influences were overridden by strong individual dispositions.

On the basis of the findings of Hertel and Fiedler (1998), we would expect the consistency of an individual's social value orientation to moderate the Disposition \times Situation pattern proposed by Van Lange (2000). That is, the social value orientation of low consistent individuals should influence their behavior when the situation remains ambiguous, that is, when the neutral primes are presented, but low consistent individuals should otherwise be susceptible to the primes when the primed construct helps disambiguate the situation. In contrast, high consistent individuals should remain impervious to the nature of the primes, and only their social value orientation should regulate their behavior.

The Present Experiments

Building on the work by Hertel and Fiedler (1998), we decided to further examine the combined impact of dispositional and situational factors on people's cooperative behavior. We conducted four experiments to test the interaction between social value orientation (pro-social vs. pro-self), the consistency of a social value orientation (high vs. low) and priming (morality vs. neutral vs. might). These experiments all had the same structure. In a first phase, we measured each participant's social value orientation and the consistency of that orientation. In a second phase, we confronted participants with morality primes, neutral primes, or might primes using supraliminal or subliminal priming techniques (Bargh, 1997; Bargh & Chartrand, 2000). Finally, we observed the priming effects on cooperative behavior in one-trial mixed-motive games.

Experiment 1

Some features of this study deserve attention. First of all, unlike Hertel and Fiedler (1998), we conducted the Ring Measure (Liebrand, 1984) as a measure of social value orientation and consistency of this orientation before the priming phase. Indeed, because Hertel and Fiedler (1998) did not use a standardized technique for measuring social value orientation before the priming phase, their results do not allow specific predictions for pro-socials and pro-selfs separately, and it may be assumed that the impact of primes was similar for both pro-socials and pro-selfs. Second, we used a one-trial simultaneous two-person give-some game (e.g., Van Lange & Kuhlman, 1994). Participants had to make one choice without having any information about their partner. We wanted to observe priming effects as purely as possible, and we wanted to rule out that our participants used their partner's choice as a basis for making their own choice.

The heart of our predictions concerned a three-way interaction involving participants' social value orientation, its consistency, and the behavioral direction suggested by the primes. We expected

² The notion of ambiguous versus disambiguated situations refers to the notion of *weak* versus *strong* situations (Snyder & Ickes, 1985; see also Van Lange, 2000). Dispositional influences should be large in weak situations, whereas situational influences should be large in strong situations.

to find the interaction between social value orientation and primes only for low consistent individuals. Because high consistent individuals should be impervious to the nature of the primes, we predicted only a main effect of social value orientation for these individuals.

In other words, we expected a main effect of primes on cooperative behavior for low consistent individuals and predicted morality primes to elicit more cooperative behavior than neutral primes, and might primes to elicit less cooperative behavior than neutral primes (Hypothesis 1). We hoped to find the effect of social value orientation on cooperative behavior to be significant in the neutral priming condition only. Specifically, low consistent pro-socials were expected to behave more cooperatively than low consistent pro-selfs only in the neutral priming condition (Hypothesis 2). In contrast, high consistent pro-socials should behave more cooperatively than high consistent pro-selfs in all priming conditions (Hypothesis 3).

Method

Participants and design. The participants were 203 undergraduates at the Katholieke Universiteit Leuven who participated as a partial fulfillment of course requirements. All were native Dutch speakers. The experimental design included three between-participants factors. These three factors were social value orientation (pro-social vs. pro-self), consistency (high vs. low), and primes (morality vs. neutral vs. might). The dependent variable was participants' cooperative behavior in a prisoner's dilemma game.

Procedure and materials. Participants came to the laboratory in groups of 8 people on average. On entering the laboratory, participants were welcomed by a male experimenter. They were told that they would participate in a number of unrelated experiments and were brought to individual soundproof cubicles. They were requested to perform a sequence of four tasks: (a) the Ring Measure; (b) a filler task; (c) the task involving the priming procedure; and (d) a simultaneous, single-trial prisoner's dilemma task. After participants completed all these tasks, they were requested to fill out a postexperimental questionnaire probing for their suspicions about the experimental procedures. Finally, they were thanked for their participation and debriefed.

Measuring social value orientation and consistency. The experiment started by assessing the social value orientation of each participant along with the consistency of that social value orientation, using the Ring Measure (Liebrand, 1984). The participants were confronted with 24 choice trials. Each trial presents a pair of imaginary money distributions between the self and another person. The distributed amounts of money for the self and for the other person can be either positive or negative. An example of a pair is the choice between Alternative A: 1,450 Belgian francs (BEF) for the self and 300 BEF for the other; and Alternative B: 1,500 BEF and 0 BEF for the other.³ The 24 pairs of outcomes lie on a circle in the own–other outcome plane defined by two orthogonal dimensions: a horizontal dimension representing the outcomes for the self and a vertical dimension representing the outcomes for the other person. Specific own–other outcomes are defined as points in the plane. The center of the circle coincides with the origin of the outcome plane, that is, the origin denotes 0 BEF for the self and 0 BEF for the other person. The radius of the circle is 1,500 BEF. Each pair consists of two equidistant own–other outcome distributions that are located next to each other on the circle. For each of the 24 pairs, participants were instructed to choose their most preferred alternative.

After the participants made all their 24 choices, we calculated the total amount of money allocated to the self and the total amount of money allocated to the other person. These two totals can be represented as coordinates on the horizontal (*own outcomes*) and vertical (*other's outcomes*) axis, defining a single point in the plane. This point provides an

estimate of the direction of the participant's orientation vector in the outcome plane. The vector represents the participant's social value orientation. Each orientation reflects a unique pattern of choices. Participants are classified on the Ring Measure as making choices consistent with one of the orientations. Participants with orientation vectors falling between 22.5° and 112.5° were classified as pro-socials, and participants with orientation vectors falling between 292.5° (or –67.5°) and 22.5° were classified as pro-selfs. Of the 203 participants, 101 could be identified as pro-socials, and 98 could be identified as pro-selfs. Four participants could not be identified because they had an orientation vector of exactly 22.5°.

We used the Ring Measure not only to determine each participant's social value orientation but also to determine the consistency of each orientation. We decided to label participants who obtained a consistency score of at least 90% as individuals with a high consistent social value orientation and participants who obtained a consistency score of at most 85% as individuals with a low consistent social value orientation. We did not perform a common median split on the consistency scores because we wanted to create a clear distinction between participants who displayed a very high consistency score and participants who yielded a lower consistency score. We obtained an even sharper distinction by omitting participants who fell in between our two criteria (i.e., between 85% and 90%). The average level of consistency was 88.3%. Of the remaining 199 participants, 110 could be labeled as high consistent individuals and 86 could be labeled as low consistent individuals.⁴ Three additional participants were discarded from the analysis because they exhibited a consistency score between 85% and 90% or because they had a consistency score that was less than 60%. This means that a total of 196 participants remained for the analysis. Fifty-three participants were classified as high consistent pro-socials, 45 were classified as low consistent pro-socials, 57 were classified as high consistent pro-selfs, and 41 were classified as low consistent pro-selfs.⁵

After completing the Ring Measure, all participants took part in a filler experiment that took 15 min. Participants had to categorize several objects into different color categories (e.g., a banana into the yellow category) and were later asked how many objects they could remember.

Priming manipulation. We used the Scrambled Sentence Test (Srull & Wyer, 1979) as a supraliminal priming technique. The task was introduced to the participants as a "language skill" test. We used 30 items, each requiring the participant to form a grammatically correct sentence with four of five words presented in a scrambled order. Prime words were embedded in 15 of the 30 items. We created three versions of the Scrambled Sentence Test, each with 15 different prime words. The words used in the morality and might priming conditions were retained from a pretest in which students had to indicate for a larger set of words which items were associated with morality or might. Only words that had positive connotations to the relevant constructs, according to the students, were selected. A first version used words related to morality⁶ (*honest, constructive, supportive, trustworthy, helpful, tolerant, sincere, fair, cooperative, honorable, caring, forthcoming, empathic, friendly, and collaborative*). A second version used words related to might (*assertive, independent, strong, powerful, autonomous, winning, self-reliant, self-assured, persistent, dominant,*

³ At the time we conducted this experiment, the Euro was not yet introduced in the countries of the European Union, and the experiment was conducted with Belgian francs as currency. 1 Euro = 40.34 BEF.

⁴ In fact, a median split resulted in nearly the same distribution of participants across high and low consistency categories (for all four experiments). Moreover, different analyses using median split and a priori criteria revealed the same pattern of results.

⁵ For all four experiments, individualists and competitors were equally distributed across low and high consistent pro-selfs.

⁶ In this and following experiments the prime words were presented in Dutch. Here we present the closest possible English translation.

resolute, striving, goal-directed, determined, and smart). A third version consisted of words that were all neutral and unrelated to any relevant behavioral response in a mixed-motive game (e.g., curved, silent, wide, oval).

Measuring cooperation in a one-trial simultaneous two-person give-some game. Next, participants were asked to participate in an ostensibly unrelated decision task. The mixed-motive game was taken from prior research (e.g., Van Lange, 1999, Study 3; Van Lange & Kuhlman, 1994). Each participant was told that he or she was paired with another participant in the laboratory. Each participant was given four chips and was told that the partner also received four chips. They had to imagine that each chip had a value of 10 BEF to themselves and a value of 20 BEF to the partner. Participants had to decide how many chips (none, one, two, three, or four) they would give to the partner. They were told that the partner also had to decide how many chips he or she would give to the participant. Each chip the participant would receive from the partner would also be worth 20 BEF. Maximal cooperation was to give four chips and maximal noncooperation was to give zero chips.⁷ Participants did not receive any information about the partner. The task did not involve monetary payoffs; participants had to imagine that each chip represented a specific amount of money. All participants understood the task structure. After participants made their decision, they were requested to fill out a postexperimental questionnaire, which probed their suspicion about any relatedness among tasks and on the priming procedure (see funneled debriefing procedure described in Bargh & Chartrand, 2000). Participants were asked whether they noticed anything unusual about the words or any particular pattern or theme to the words in the Scrambled Sentence Test. None of the participants deciphered any relationship among words in the priming task. Also, none of the participants indicated any suspicion of a relationship between the priming task and the subsequent prisoner's dilemma game. Finally, students were thanked for their participation and debriefed.

Results

A 2 (social value orientation: pro-social vs. pro-self) \times 2 (consistency: high vs. low) \times 3 (primes: morality vs. neutral vs. might) between-participants analysis of variance (ANOVA) was conducted on cooperative behavior. This analysis revealed the presence of two significant main effects. First, we obtained a main effect of social value orientation, $F(1, 184) = 23.10, p < .01$. Pro-socials ($M = 2.16, SD = 1.24$) showed more cooperation than pro-selfs ($M = 1.48, SD = 1.17$). Second, a main effect of primes, $F(2, 184) = 36.50, p < .01$, revealed that morality primes ($M = 2.48, SD = 1.23$) produced significantly more cooperation than neutral primes ($M = 1.95, SD = 1.10$), which in turn produced significantly more cooperation than might primes ($M = 1.04, SD = 0.99$).

Furthermore, we obtained a significant three-way interaction between social value orientation, consistency, and primes, $F(2, 184) = 6.99, p < .01$. The means for this three-way interaction are shown in Figure 1. To further analyze this interaction, we conducted separate 2 (social value orientation: pro-social vs. pro-self) \times 3 (primes: morality vs. neutral vs. might) between-participants ANOVAs for low consistent participants and for high consistent participants.

For the low consistent participants, the analysis only revealed the presence of a significant main effect of primes, $F(1, 80) = 28.85, p < .01$. As predicted by Hypothesis 1, morality primes ($M = 2.90, SD = 0.74$) elicited greater cooperation than neutral primes ($M = 1.86, SD = 1.03$), $F(2, 80) = 16.71, p < .01$, whereas might primes ($M = 0.99, SD = 1.12$) elicited less cooperation than neutral primes, $F(1, 80) = 11.17, p < .01$. To test

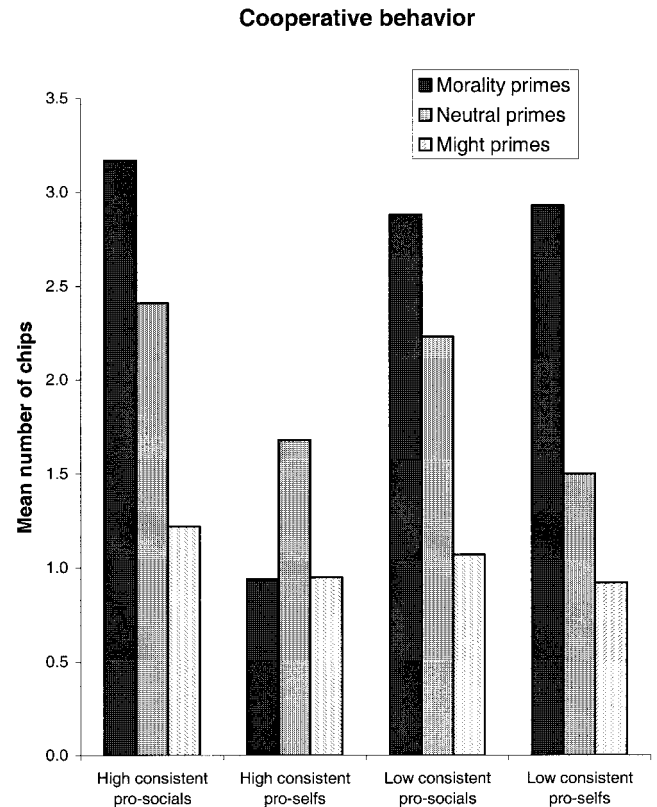


Figure 1. Mean cooperative behavior as a function of social value orientation, consistency, and primes (Experiment 1)

Hypothesis 2, we calculated a planned comparison between low consistent pro-socials and low consistent pro-selfs in the neutral priming condition. This marginally significant contrast revealed that low consistent pro-socials exhibited more cooperative behavior than low consistent pro-selfs in the neutral priming condition ($M = 2.23, SD = 0.93$ vs. $M = 1.50, SD = 1.02$), $F(1, 80) = 3.87, p < .06$. Additional planned comparisons revealed no significant differences between low consistent pro-socials and low consistent pro-selfs in the morality priming condition ($M = 2.88, SD = 0.78$ and $M = 2.92, SD = 0.73$), $F(1, 80) < 1, ns$, and in the might priming condition ($M = 1.06, SD = 1.22$ and $M = 0.92, SD = 1.04$), $F(1, 80) < 1, ns$. Hypotheses 1 and 2 were supported.

For high consistent participants, the analysis unexpectedly revealed two significant main effects. First, we obtained the predicted main effect of social value orientation, $F(1, 104) = 32.99, p < .01$. High consistent pro-socials ($M = 2.26, SD = 1.24$) displayed greater cooperation than high consistent pro-selfs ($M = 1.19, SD = 1.04$). Second, the analysis also showed a main effect of primes, $F(2, 104) = 12.07, p < .01$. Might primes ($M = 1.08, SD = 0.91$) elicited significantly less cooperation than morality primes ($M = 2.05, SD = 1.43$) and neutral primes ($M = 2.04, SD = 1.16$). These main effects were qualified by a significant two-way interaction between social value orientation

⁷ We never used words like *cooperation*, *noncooperation*, *pro-social*, or *pro-self* in the instructions.

and primes, $F(2, 104) = 9.92, p < .01$. Post hoc comparisons using Tukey's honestly significant difference indicated that high consistent pro-socials cooperated more than high consistent pro-selfs in the neutral priming condition ($M = 2.41, SD = 1.17$ vs. $M = 1.68, SD = 1.05$) and in the morality priming condition ($M = 3.16, SD = 0.86$ vs. $M = 0.94, SD = 0.94$) but not in the might priming condition ($M = 1.22, SD = 0.81$ and $M = 0.95, SD = 1.00$). Post hoc comparisons also revealed that high consistent pro-socials showed greater cooperation in the morality priming condition ($M = 3.16, SD = 0.86$) than in the neutral priming condition ($M = 2.41, SD = 1.17$) and less cooperation in the might priming condition ($M = 1.22, SD = 0.81$) than in the neutral priming condition. Additional post hoc comparisons indicated that high consistent pro-selfs showed less cooperation in the morality priming condition ($M = 0.94, SD = 0.94$) and in the might priming condition ($M = 0.95, SD = 1.00$) than in the neutral priming condition ($M = 1.68, SD = 1.05$). There was no significant difference between high consistent pro-selfs in the morality priming condition and those in the might priming condition. These results disconfirmed Hypothesis 3.

Discussion

The results of Experiment 1 only partially supported our predictions. The data pattern of low consistent individuals clearly showed that social value orientation only affected cooperative behavior in the neutral priming condition and not in the morality and might priming conditions. Furthermore, cooperative behavior of low consistent individuals shifted in prime-consistent directions. Our predictions for high consistent individuals were not supported. Instead of only a main effect of social value orientation, we obtained an interaction of social value orientation with primes, which indicated that, in contrast to Hertel and Fiedler (1998), high consistent individuals were in fact sensitive to the primes. High consistent pro-socials' cooperative behavior clearly assimilated to the primes. High consistent pro-selfs' behavior, however, assimilated to the primes in the might priming condition only. Indeed, high consistent pro-selfs actually behaved less cooperatively in the morality than in the neutral priming condition!

How can we explain why high consistent pro-selfs exhibited the same degree of (non)cooperative behavior in might and morality priming conditions? Because morality primes can be associated with cooperative behavior, how can we then explain why morality primes directly lead high consistent pro-selfs to behave selfishly? An explanation may be offered by referring to earlier work by Herr (1986; see also Neuberg, 1988). Herr suggested that in mixed-motive interdependence situations, beliefs about partner's cooperation likely play a central role in connecting primes with cooperative behavior. It might be that in Experiment 1, our participants engaged in some sort of spontaneous expectation formation process. Previous social dilemma research has already demonstrated that expectations of partner's cooperation serves as an important ingredient in an individual's decision (e.g., De Bruin & Van Lange, 1999; Kuhlman & Wimberley, 1976; Van Lange & Kuhlman, 1994). Interdependence theory and related perspectives (Kelley & Thibaut, 1978; McClintock, Kramer, & Keil, 1984; Messick & Cook, 1983) also state that cooperative behavior may be shaped by expectations or beliefs regarding pro-social intentions and behavior by the partner. Research also has indicated that

the extent to which expectations serve as an ingredient for behaving in dilemmas may depend on one's social value orientation. Pro-socials are found to follow a "behavioral assimilation" principle (Kelley & Stahelski, 1970). These individuals desire reciprocity: They act cooperatively as long as they expect the other to cooperate but act selfishly if they expect the other to be a noncooperative individual. Pro-selfs are less guided by considerations of reciprocity and rather exhibit tendencies to exploit cooperative behavior of interdependent others. Thus, because forming expectations of partner's cooperation seems to be a dominant cognitive activity preceding cooperative decision-making, priming with morality or might could influence the expectation process instead of directly activating behavioral responses.

Building on this analysis, we suggest that participants in Experiment 1 engaged in some expectation formation process and that the resulting expectations were influenced by the presence of the primes. In the neutral priming condition, lacking relevant cues to guide their behavior, participants may have been influenced in their expectations by their social value orientation. Kuhlman and Wimberley (1976) indeed found that pro-socials expected more cooperation from other individuals than pro-selfs in an ambiguous mixed-motive setting. In situations with relevant cues (e.g., the morality and might priming conditions), individuals have relied on the nature of the primes to form expectations. Because morality features are associated with cooperative persons (Deutsch, 1982; Liebrand et al., 1986; Van Lange & Kuhlman, 1994), they could have caused participants to expect a high degree of cooperation from the partner. Might features, being linked to noncooperative persons (Liebrand et al., 1986; Sattler & Kerr, 1991; Van Lange & Liebrand, 1989), could have induced participants to expect a low degree of cooperation from the partner. In turn, these expectations regarding the level of partner's cooperation may have triggered the specific behavioral tendencies we observed.

The above rationale can account for the fact that high consistent pro-socials as well as low consistent individuals showed behavioral assimilation to the primes (Kelley & Stahelski, 1970). More importantly, such an explanation also clarifies why high consistent pro-selfs did not always show behavioral assimilation. As a matter of fact, they acted in a noncooperative manner in the neutral priming condition and played more competitively after exposure to might primes. However, they also played less cooperatively after seeing morality primes. If morality primes led these individuals to perceive their partner as a cooperative person, then their noncooperative reaction could be typified as "exploitation." In other words, because high consistent pro-selfs likely judge cooperative others as rather weak and exploitable, they are tempted to adopt a noncooperative strategy.

Our next experiments were undertaken to test the intriguing hypothesis that expectations are spontaneously formed in a mixed-motive situation. We predicted that social value orientation and primes would influence participants' expectations of their partner's cooperation, depending on the ambiguity of the situation. Also, we hypothesized that these expectations would be used by participants to determine their cooperative behavior. We expected the manner in which such expectations would serve as an ingredient for cooperative decision making would be moderated by the pro-social/pro-self direction and consistency of a social value orientation.

Experiment 2

The discussion of Experiment 1 suggests that social value orientation and primes will both contribute to shaping participants' expectations about their partners. Specifically, we hypothesized a main effect of priming on expectations of partner's cooperation: Morality primes should elicit more expected cooperation of the partner than neutral primes, and might primes should elicit less expected cooperation of the partner than neutral primes. We also predicted a main effect of social value orientation on expectations of partner's cooperation: Pro-socials should expect more cooperation from their partners than pro-selfs. Finally, we predicted that the impact of social value orientation would be smaller in the morality and might priming conditions than in the neutral priming condition.

We expected quite a different pattern to emerge for participants' cooperative behavior. Consistent with Experiment 1, we expected morality primes to induce more cooperation than neutral or might primes among all participants but high consistent pro-self individuals. This prediction relied on the intuition that high consistent pro-selfs would take advantage of a partner seen as cooperative. In line with this reasoning, we also predicted the correlation between expectations and cooperative behavior to be positive in all conditions except for high consistent pro-selfs in the morality priming condition, for which we predicted the correlation would be negative.

Method

Participants and design. In total, 193 students at the Katholieke Universiteit Leuven participated in the experiment as partial fulfillment of course requirements. All were native Dutch speakers. The experimental design included the same three between-participants factors as in Experiment 1. We assessed each participant's expectations of partner's cooperation and cooperative behavior.

Procedure and materials. The procedure was identical to the procedure in Experiment 1 except for the assessment of participants' expectations of partner's cooperation. The experiment started by assessing each participant's social value orientation and consistency. Of the 193 participants, 98 could be identified as pro-socials, and 94 could be identified as pro-selfs. One participant could not be identified because of an orientation vector of exactly 22.5°. The average level of consistency was 85.6%. Of the remaining 192 participants, 98 could be labeled as high consistent individuals, and 88 could be labeled as low consistent individuals. Six additional participants were discarded from the analysis because they exhibited a consistency score between 85% and 90% or because they had a consistency score that was less than 60%. This means that a total of 186 participants remained for the analyses. Fifty participants were classified as high consistent pro-socials, 45 as low consistent pro-socials, 48 as high consistent pro-selfs, and 43 as low consistent pro-selfs.

After completing the filler task, participants were randomly assigned to one of three priming conditions (morality vs. neutral vs. might primes). Immediately after resolving the 30 sentences of the Scrambled Sentence Test, participants took part in the same fictitious two-person give-some game as in Experiment 1. In addition to the procedure of Experiment 1, we asked each participant the following question: "How many chips do you expect the other will give to you?" One half of the participants received this question before making their own decision. For the other half, the order was reversed.⁸ All participants understood the task structure. Afterward, participants also had to fill out the same postexperimental questionnaire as in Experiment 1. This questionnaire revealed that none of the participants indicated any suspicion on the priming procedure or any relatedness among

the different tasks of the experiment. Finally, after making their decisions, participants were thanked for their participation and debriefed.

Results

Expectations of partner's cooperation. We conducted a 2 (social value orientation: pro-social vs. pro-self) \times 2 (consistency: high vs. low) \times 3 (primes: morality vs. neutral vs. might) between-participants ANOVA on expectations of partner's cooperation. This analysis revealed two significant main effects. We obtained the predicted main effect of primes, $F(2, 174) = 61.39, p < .01$. Planned comparisons revealed that morality primes ($M = 2.93, SD = 0.82$) elicited higher expectations of partner's cooperation than neutral primes ($M = 2.26, SD = 0.81$), $F(1, 174) = 20.86, p < .01$, and that might primes ($M = 1.30, SD = 0.85$) elicited lower expectations of partner's cooperation than neutral primes, $F(1, 174) = 41.64, p < .01$. There was also a significant main effect of social value orientation, $F(1, 174) = 7.74, p < .01$, which revealed that pro-socials ($M = 2.33, SD = 0.95$) expected significantly more cooperation from their partners than pro-selfs ($M = 1.99, SD = 1.14$). A planned comparison revealed that there was a significant difference between pro-socials and pro-selfs at the neutral priming level ($M = 2.56, SD = 0.75$ vs. $M = 1.96, SD = 0.76$), $F(1, 174) = 8.08, p < .01$. No such difference emerged at the morality priming level ($M = 2.96, SD = 0.73$ and $M = 2.90, SD = 0.90$), $F(1, 174) < 1, ns$, and only a marginally significant difference was found at the might priming level ($M = 1.48, SD = 0.67$ and $M = 1.13, SD = 0.97$), $F(1, 174) = 2.84, p < .10$. The difference between pro-socials and pro-selfs was significantly larger at the neutral priming level than at the morality priming level, $t(123) = 3.89, p < .001$, and than at the might priming level, $t(122) = 1.74, p < .05$. The difference between pro-socials and pro-selfs was also larger at the might priming level than at the morality priming level, $t(121) = 2.09, p < .05$.

Cooperative behavior. We conducted a 2 (social value orientation: pro-social vs. pro-self) \times 2 (consistency: high vs. low) \times 3 (primes: morality vs. neutral vs. might) between-participants ANOVA on cooperative behavior in the give-some task. This analysis revealed the presence of two significant main effects. First, a main effect of social value orientation, $F(1, 174) = 35.59, p < .01$, indicated that pro-socials ($M = 2.22, SD = 1.23$) cooperated more than pro-selfs ($M = 1.38, SD = 1.14$). Second, a main effect of primes, $F(2, 174) = 30.99, p < .01$, revealed that morality primes ($M = 2.37, SD = 1.41$) elicited significantly more cooperative behavior than neutral primes ($M = 1.98, SD = 1.13$), whereas might primes ($M = 1.06, SD = 0.79$) elicited significantly less cooperative behavior than neutral primes.

Turning to the key prediction of the present study, we also replicated the three-way interaction between social value orientation, consistency, and primes, $F(2, 174) = 9.72, p < .01$. The means of this interaction, together with the expectation means, are represented in Figure 2. To analyze this interaction in a more focused way, we broke down the sum of squares associated with the priming effect into two orthogonal a priori Helmert contrasts. The first contrast (C1) compared the morality priming condition

⁸ We found no effects of different expectation-choice orders in Experiments 2, 3, and 4. Therefore, this factor is excluded from further reporting.

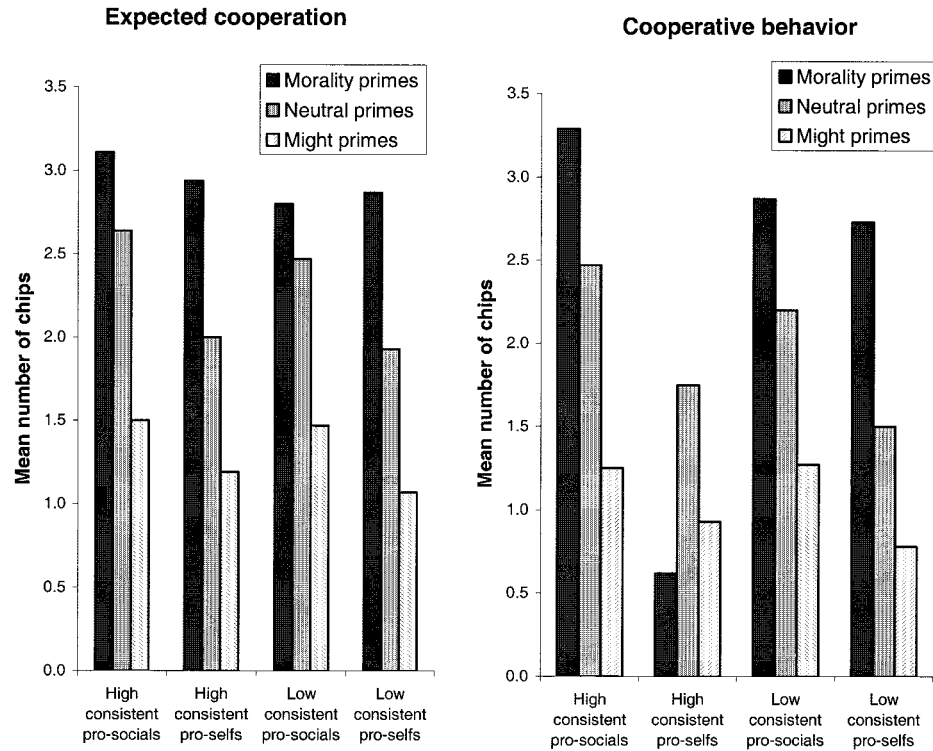


Figure 2. Mean expectations of partners' cooperation (left panel) and mean cooperative behavior (right panel) as a function of social value orientation, consistency, and primes (Experiment 2).

with the neutral and might priming conditions. The second contrast (C2) compared the neutral priming condition with the might priming condition. We then examined whether C1 and C2 varied as a function of the interaction between social value orientation and consistency. We expected C1 to be moderated by this interaction but not C2.

C1 appeared to be significant, $F(1, 174) = 33.73, p < .01$. Participants in the morality priming condition ($M = 2.37, SD = 1.41$) behaved more cooperatively than participants in the neutral–might priming conditions ($M = 1.52, SD = 1.08$). The C2 contrast was also significant, $F(1, 174) = 28.50, p < .01$. Participants in the might priming condition ($M = 1.06, SD = 0.79$) behaved less cooperatively than participants in the neutral priming condition ($M = 1.98, SD = 1.13$). In line with our hypothesis, C1 varied as a function of the interaction between social value orientation and consistency, $F(1, 174) = 19.43, p < .01$. For high consistent pro-socials, low consistent pro-socials, and low consistent pro-selfs, cooperative behavior was higher in the morality priming condition ($M = 2.96, SD = 0.97$) than in the neutral–might priming conditions ($M = 1.41, SD = 1.11$), $t(136) = 7.17, p < .0001$. In contrast, cooperative behavior among the high consistent pro-selfs was even lower in the morality priming condition ($M = 0.63, SD = 0.95$) than in the other two priming conditions ($M = 1.35, SD = 0.96$), $t(46) = -2.43, p < .05$. As expected, C2 was not moderated by the interaction between social value orientation and consistency, $F(1, 174) < 1, ns$.

Relationship between expectations of partner's cooperation and cooperative behavior. Correlations were calculated to explore the relationship between expectations of partner's cooperation and

cooperative behavior. All correlations, except the correlation for high consistent pro-selfs in the neutral priming condition ($r = -.16, ns$), were significant. The correlation between expectations and behavior for high consistent pro-selfs in the morality priming condition was strongly negative ($r = -.81, p < .01$). All the other correlations were strongly positive and ranged between .58 and .93.

Discussion

With respect to participants' cooperative behavior, we replicated the results of Experiment 1. Moreover, we extended the results of Experiment 1 by showing that social value orientation and primes combined to influence participants' expectations of partner's cooperation. Specifically, the effect of social value orientation on expectations was only significant at the neutral priming level but not at the morality priming level or the might priming level. In these conditions, primes simply overrode the dispositional influences on expectations.

A remarkable finding is that expectations of partner's cooperation assimilated to the primes for all participants. This highlights an important result of our study: Whereas expectations held by high consistent pro-selfs assimilated to morality primes, their behavior did not. The corroborating strong negative correlation between the expectations and the behavior of high consistent pro-selfs indicated that the more high consistent pro-selfs believed their partner to be cooperative the more they exploited him or her.

High consistent pro-socials and the low consistent individuals (i.e., low consistent pro-socials and low consistent pro-selfs) dis-

played strong positive correlations between expectations of partner's cooperation and cooperative behavior. This confirms that for these individuals expectations are an important ingredient for regulating behavioral assimilation.⁹ High consistent pro-selfs in the neutral priming conditions are less affected by expectations and generally behaved in a noncooperative manner. High consistent pro-selfs are more affected by expectations in the morality and might priming conditions. The strong negative correlation in the morality priming condition and the strong positive correlation in the might priming condition showed that these individuals were strongly inclined to, respectively, exploit cooperative others and compete with noncooperative others.

The results of Experiment 2 thus provide encouraging support for our explanation of the results of Experiment 1 in terms of an expectation formation process. In the remaining experiments, we investigated whether this pattern could also be replicated when subliminal rather than supraliminal priming was used (Experiment 3) and when an *N*-person dilemma game was proposed (Experiment 4).

Experiment 3

In Experiment 3 we wanted to investigate whether the priming effects on expectations of partner's behavior could also be obtained in a context that relies on unconscious priming. This would dispel possible doubts about the impact of demand characteristics and the conscious or strategic nature of the obtained priming effects (Bargh & Chartrand, 2000). We tried to replicate the results of Experiment 2 using subliminal priming. Compared with Experiment 2, we omitted the neutral primes and only used morality and might primes.

Method

Participants and design. One hundred forty students at the Katholieke Universiteit Leuven participated in the experiment in partial fulfillment of course requirements. Two participants were not native Dutch speakers, and they were excluded from all subsequent analyses. The experimental design included three between-participants factors: social value orientation (pro-social vs. pro-self), consistency (high vs. low), and primes (morality vs. might). As in Experiment 2, we assessed each participant's expectation of partner's cooperation and cooperative behavior in a two-person prisoner's dilemma game.

Procedure and materials. We followed the same procedure as in previous experiments. Of the 138 participants, 64 could be identified as pro-socials, and 68 could be identified as pro-selfs. Six participants could not be identified because of an orientation vector of exactly 22.5°. The average level of consistency was 86.1%. Of the remaining 132 participants, 67 were labeled as high consistent individuals, and 61 were labeled as low consistent individuals. Four additional participants were discarded from the analysis because they exhibited a consistency score between 85% and 90% or because they had a consistency score that was less than 60%. A total of 128 participants remained for the analyses. Thirty-two participants were classified as high consistent pro-socials, 30 participants as low consistent pro-socials, 35 participants as high consistent pro-selfs, and 31 participants as low consistent pro-selfs.

After performing the filler task, participants were exposed to subliminal primes. They were randomly assigned to one of two priming conditions (morality vs. might primes). They were seated in front of a computer screen and received instructions for a lexical decision task: A series of letter strings was going to be presented on the screen, and participants had to indicate after each presentation of a letter string whether this string was an

existing word or not. The participants were informed that each presentation would be very brief. The lexical decision task started with 6 practice trials, followed by 30 experimental trials. On each trial, a fixation point first appeared on the computer screen. Participants had to press the "2" key to start the presentation of a letter string. This letter string remained on the screen for 27 ms and was immediately replaced by a mask ("XQFBZRMQWGBX"), which remained on the screen for 225 ms. After each trial, participants faced a blank screen and were asked to indicate their decision by pressing a key on the keyboard ("1" for an existing word, "3" for a nonword). Once the answer was given, a new fixation point appeared on the screen after a 1,500-ms pause. The same morality and might primes as in Experiments 1 and 2 were used. All these words were used once. Hence, the 30 experimental trials consisted of 15 prime words and 15 nonwords. The 6 practice trials and the 30 experimental trials were randomized for each participant.

After participants completed the lexical decision task, they took part in the same fictitious two-person give-some game as in Experiments 1 and 2. Counterbalanced with the question about their own choice, we also asked each participant about his or her expectations of their partner's cooperation. All participants understood the task structure. After the experiment, participants were probed for awareness of the priming stimuli. As expected, participants could not retrieve any of the presented primes. Also, none of the participants revealed suspicion about any relatedness between the priming procedure and the prisoner's dilemma game. Finally, after making their decisions, participants were thanked for their participation and debriefed.

Results and Discussion

Expectations of partner's cooperation. A 2 (social value orientation: pro-social vs. pro-self) \times 2 (consistency: high vs. low) \times 2 (primes: morality vs. might) between-participants ANOVA on expectations of partner's cooperation was conducted. This analysis revealed the presence of two significant main effects. First of all, a main effect of social value orientation, $F(1, 120) = 8.32, p < .01$, indicated that pro-socials ($M = 2.01, SD = 1.32$) had higher expectations of partner's cooperation than pro-selfs ($M = 1.59, SD = 1.08$). Second, a main effect of primes, $F(1, 120) = 126.05, p < .01$, revealed that morality primes ($M = 2.63, SD = 0.97$) elicited higher expectations of partner's cooperation than might primes ($M = 0.97, SD = 0.81$).

Cooperative behavior. We conducted a 2 (social value orientation: pro-social vs. pro-self) \times 2 (consistency: high vs. low) \times 2 (primes: morality vs. might) between-participants ANOVA on cooperative behavior. This analysis revealed three significant main

⁹ Correlations were calculated with the assumption that expectations of partner's cooperation influenced cooperative behavior. Behavior may in part influence expectations, but two arguments are against this. First, we counterbalanced the order of assessing expectations and behavior. There was no order effect. Making a choice did not influence the formation of expectations. Second, and more important, high consistent pro-selfs in the morality priming condition showed a high degree of expected cooperation while they acted in a noncooperative manner. If one assumes individuals using their own behavior as a basis for forming expectations, then one should expect that high consistent pro-selfs used their own noncooperative behavior in the morality priming condition to form noncooperative expectations of their partner. Instead, these individuals had strong cooperative expectations of their partner's cooperation. Therefore, we assume that because all individuals' expectations assimilated to the primes, expectations of partner's cooperation had a much stronger impact on cooperative behavior than vice versa.

effects. We obtained a main effect of social value orientation, $F(1, 120) = 27.30, p < .0001$. Pro-socials ($M = 1.95, SD = 1.32$) displayed more cooperation than pro-selfs ($M = 1.14, SD = 1.11$). Second, a main effect of consistency, $F(1, 120) = 7.01, p < .01$, revealed that low consistent participants ($M = 1.75, SD = 1.28$) displayed more cooperative behavior than high consistent participants ($M = 1.34, SD = 1.24$). Primes showed a third significant main effect, $F(1, 120) = 81.89, p < .001$, indicating that morality primes ($M = 2.24, SD = 1.35$) elicited more cooperative behavior than might primes ($M = 0.85, SD = 0.78$).

There was also a significant three-way interaction between social value orientation, consistency, and primes, $F(1, 120) = 18.43, p < .01$. Figure 3 presents the means of this interaction, together with the expectation means. Subsequent analyses revealed that for high consistent pro-selfs cooperative behavior did not differ between the morality priming condition ($M = 0.65, SD = 0.60$) and the might priming condition ($M = 0.78, SD = 1.05$), $t(33) < 1, ns$. For all other individuals (i.e., high consistent pro-socials, low consistent pro-socials, and low consistent pro-selfs), cooperative behavior was higher in the morality priming condition ($M = 2.77, SD = 0.64$) than in the might priming condition ($M = 0.87, SD = 0.83$), $t(91) = 9.67, p < .01$.

Relationship between expectations of partner's cooperation and cooperative behavior. As in Experiment 2, we calculated correlations between expectations of partner's cooperation and own behavior. All these correlations were statistically significant. The correlation between expectations and behavior for high consistent pro-selfs in the morality priming condition was strongly negative

($r = -.74, p < .01$). All the other correlations were strongly positive and ranged between .66 and .89.

In Experiment 3, we again obtained evidence showing that expectations of partner's cooperation assimilated to the primes, even if participants were unaware of the priming influence. Low consistent pro-selfs showed strong behavioral assimilation to beliefs of the partner, as did both groups of pro-socials. High consistent pro-selfs, however, displayed the same degree of cooperative behavior in the morality and might priming conditions. The strong correlations showed that expectations of partner's cooperation were an important ingredient in their decisions, either to compete with a noncooperative partner (positive correlation) or to exploit a cooperative partner (negative correlation).

Experiment 4

In Experiment 4, we tried to obtain further support for the idea that expectations are spontaneously formed and play an important role in mixed-motive interdependence situations. To obtain evidence whether this phenomenon generalizes beyond a two-person game, we conducted a study in an N -person mixed-motive game context. Apparently, forming expectations of partner's cooperation happens to be a dominant cognitive activity in a two-person game and could therefore become influenced by the priming procedure (see also Herr, 1986; Neuberg, 1988). However, with an increasing number of people involved in a game, expectations might become harder to form and might play a lesser role than in a two-person game. In the present experiment, we examined whether individuals

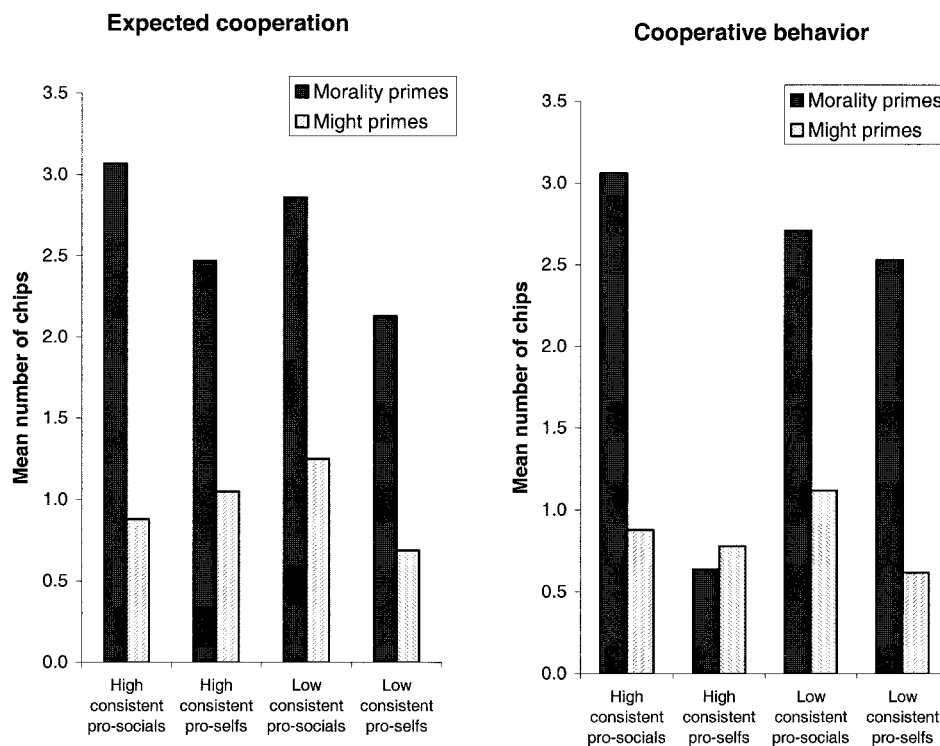


Figure 3. Mean expectations of partner's cooperation (left panel) and mean cooperative behavior (right panel) as a function of social value orientation, consistency, and primes (Experiment 3).

in an N -person game also spontaneously form expectations of other persons' cooperation and whether cooperative behavior is strongly related to these expectations.

We told our participants that they would participate in a 10-person-divisible public-good game. Apart from the number of individuals involved in the game, there is another difference with the game used in previous experiments. In a 2-person game, one has to give to the partner and vice versa. Given chips are considered a loss. In the 10-person game, participants were told that they had to give to the group as a whole (the value of what they gave would be doubled). Afterward, the monetary value of the group total would be divided by the number of individuals involved in the game (i.e., 10). This means that every participant would be returned one fifth of the original value of their own chip(s) that have been given to the group. This game has every characteristic of a dilemma game (Dawes, 1980): Noncooperation always yields higher outcomes than cooperation, and mutual cooperation is always better than mutual noncooperation.

Method

Participants and design. One hundred sixty-seven students at the Katholieke Universiteit Leuven participated in the experiment in partial fulfillment of course requirements. All were native Dutch speakers. The experimental design included the same three between-participants factors as in Experiments 1 and 2. We also assessed each participant's expectations of partners' cooperation and cooperative behavior.

Procedure and materials. We followed the same procedure as in the previous experiments. Of the 167 participants, 86 could be identified as pro-socials, and 76 could be identified as pro-selfs. Five participants could not be identified because of an orientation vector of exactly 22.5°. The average level of consistency was 87.1%. Of the remaining 162 participants, 78 were labeled as high consistent individuals, and 77 were labeled as low consistent individuals. Seven additional participants were discarded from the analysis because they exhibited a consistency score between 85% and 90% or because they had a consistency score that was less than 60%. This means that a total of 155 participants remained for the analyses. Of those remaining participants, 40 were classified as high consistent pro-socials, 41 as low consistent pro-socials, 38 as high consistent pro-selfs, and 36 as low consistent pro-selfs.

After performing the filler task, participants were instructed to resolve the same Scrambled Sentence Test as in Experiments 1 and 2. Participants were randomly assigned to one of three priming conditions (morality vs. neutral vs. might primes). After completing the priming procedure, they took part in a one-trial simultaneous 10-person give-some game. Participants were informed that they were members of a 10-person group, but they would not receive any information about the identity of their fellow group members. All group members were given four chips, which could be used to invest. The chips they did not invest would accrue entirely to themselves. Each chip invested, however, would result in a group payoff of twice the value of that chip. The total group payoff would be divided equally among all group members. Participants were asked to imagine that each of their own chips had a value of 10 BEF to the initial owner and a value of 20 BEF to the group. Their task was to decide how many chips (none, one, two, three, or four) they would give to the group. Maximal cooperation was to give four chips and maximal noncooperation was to give zero chips. Participants were also told that all the other participants had to make the same decision. There were no monetary payoffs involved in this game. We also asked each participant about his or her expectations of the other members' cooperation ("How many chips do you think the other nine members will give collectively to the group?"), which was again counterbalanced with their own choice. All participants comprehended the task structure. Participants also did not indicate any suspicion on the

priming procedure or on any relatedness among the different tasks of the experiment. After making their decisions, participants were thanked for their participation and debriefed.

Results and Discussion

Expectations of partners' cooperation. A 2 (social value orientation: pro-social vs. pro-self) \times 2 (consistency: high vs. low) \times 3 (primes: morality vs. neutral vs. might) between-participants ANOVA on expectations of partners' cooperation was conducted. This analysis revealed two significant main effects. A main effect of social value orientation, $F(1, 143) = 12.31, p < .01$, indicated that pro-socials ($M = 21.11, SD = 6.76$) expected more cooperation of the other members than pro-selfs ($M = 18.60, SD = 6.59$). There was also a main effect of primes, $F(2, 143) = 95.37, p < .01$. Morality primes ($M = 25.76, SD = 4.68$) elicited higher expectations of partners' cooperation than neutral primes ($M = 20.21, SD = 5.69$), and might primes ($M = 13.60, SD = 3.11$) elicited lower expectations of partners' cooperation than neutral primes.

These two main effects were qualified by an interaction between social value orientation and primes, $F(2, 143) = 3.50, p < .05$. Planned comparisons clarified this two-way interaction by showing that pro-socials had higher expectations of their partners' cooperation than pro-selfs in the neutral priming condition ($M = 22.78, SD = 5.14$ vs. $M = 17.61, SD = 5.06$), $F(1, 143) = 17.27, p < .01$, and not in the morality priming condition ($M = 26.60, SD = 4.52$ vs. $M = 24.92, SD = 4.78$), $F(1, 143) = 1.90, ns$, or in the might priming condition ($M = 13.96, SD = 5.60$ vs. $M = 13.25, SD = 3.60$), $F(1, 143) < 1, ns$. Differences in means between pro-socials and pro-selfs were larger in the neutral priming condition than in the morality priming condition, $t(103) = 3.66, p < .01$, and in the might priming condition, $t(100) = 5.31, p < .01$. Differences in means between pro-socials and pro-selfs did not differ between the morality priming condition and the might priming condition, $t(101) = 1.14, ns$.

Cooperative behavior. A 2 (social value orientation: pro-social vs. pro-self) \times 2 (consistency: high vs. low) \times 3 (primes: morality vs. neutral vs. might) between-participants ANOVA was conducted on cooperative behavior in the 10-person game. We found three significant main effects. First of all, we obtained a main effect of social value orientation, $F(1, 143) = 51.54, p < .01$, which indicated that pro-socials ($M = 2.55, SD = 1.08$) cooperated more than pro-selfs ($M = 1.65, SD = 1.04$). Second, we obtained a main effect of consistency, $F(1, 143) = 9.22, p < .01$, showing that low consistent participants ($M = 2.29, SD = 1.05$) cooperated more than high consistent participants ($M = 1.91, SD = 1.22$). Third, we obtained a main effect of primes, $F(2, 143) = 45.74, p < .01$. Morality primes ($M = 2.73, SD = 1.21$) elicited significantly more cooperative behavior than neutral primes ($M = 2.29, SD = 1.00$), and might primes ($M = 1.29, SD = 0.68$) elicited significantly less cooperative behavior than neutral primes.

The three-way interaction between social value orientation, consistency, and primes reached a conventional level of significance, $F(2, 143) = 3.94, p < .05$. The means for this three-way interaction, together with the expectations means, are shown in Figure 4. We analyzed this interaction by breaking down the sum of squares

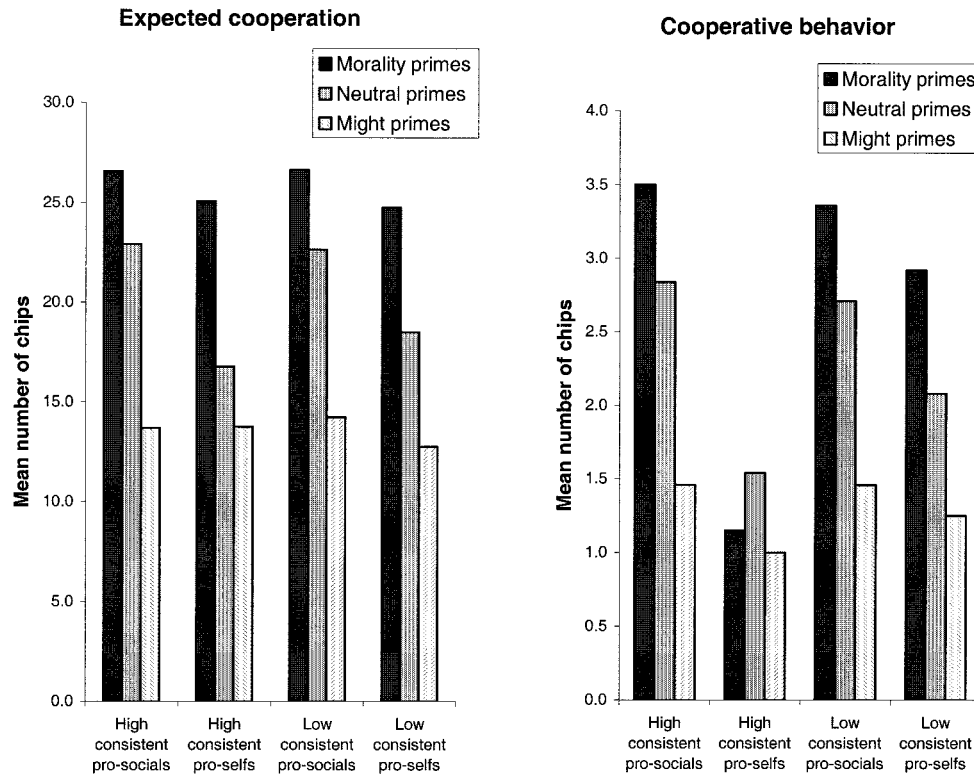


Figure 4. Mean expectations of partner's cooperation (left panel) and mean cooperative behavior (right panel) as a function of social value orientation, consistency, and primes (Experiment 4).

associated with the priming effect into two orthogonal a priori Helmert contrasts, as in Experiment 2. The first contrast (C1) compared the morality priming condition with the neutral and might priming conditions. The second contrast (C2) compared the neutral priming condition with the might priming condition. We then examined whether the interaction between social value orientation and consistency varied as a function of C1 and C2.

The C1 contrast was significant, $F(1, 143) = 50.36, p < .01$. Participants in the morality priming condition ($M = 2.73, SD = 1.21$) behaved more cooperatively than participants in the neutral–might priming conditions ($M = 1.79, SD = 0.99$). The C2 contrast was also significant, $F(1, 143) = 42.12, p < .01$. Participants in the might priming condition ($M = 1.29, SD = 0.68$) behaved less cooperatively than participants in the neutral priming condition ($M = 2.29, SD = 1.00$). In line with what we expected, the C1 contrast varied as a function of the interaction between social value orientation and consistency, $F(1, 143) = 7.45, p < .01$. For high consistent pro-socials, low consistent pro-socials, and low consistent pro-selfs, cooperative behavior was higher in the morality priming condition ($M = 3.26, SD = 1.02$) than in the neutral–might priming conditions ($M = 1.97, SD = 0.92$), $t(115) = 7.43, p < .01$. Cooperative behavior among the high consistent pro-selfs did not differ significantly between the morality priming condition ($M = 1.15, SD = 0.69$) and the neutral–might priming conditions ($M = 1.27, SD = 0.81$), $t(36) < 1, ns$. As expected, the C2 contrast did not vary as a function of the

interaction between social value orientation and consistency, $F(1, 143) < 1, ns$.

Relationship between expectations of partners' cooperation and cooperative behavior. Correlations between expectations and behavior were calculated and were all statistically significant. There was a negative expectation–behavior correlation for high consistent pro-selfs in the morality priming condition ($r = -.72, p < .01$). All the other expectation–behavior correlations were positive and ranged between .59 and .85.

The results of Experiment 4 clearly replicated those of Experiments 2 and 3. Individuals also spontaneously formed expectations in a 10-person game context. Social value orientation and primes jointly influenced expectations. In the morality and might priming conditions, expectations assimilated to the primes. Expectations–behavior correlations were strongly positive, except for high consistent pro-selfs in the morality priming condition, where a negative correlation was found.

General Discussion

On the Role of Expectations About the Partner

Previous research has found that both social value orientation and primes affect people's cooperative behavior. More recently, it was suggested that social interactions in mixed-motive settings reflect a Disposition \times Situation interaction (Van Lange, 2000; Van Lange, Agnew, et al., 1997), with dispositional influences

playing a larger role in ambiguous situations than in disambiguated situations. Building on the work by Hertel and Fiedler (1998), we predicted that the latter interaction would be more pronounced among low than high consistent individuals. The results showed that both low consistent pro-self and low consistent pro-social individuals assimilated their behavior toward the primes and that differences between these groups were obtained in the neutral priming condition only. We basically obtained the same patterns of decision data among the high consistent individuals, with the notable exception that high consistent pro-selfs contrasted their behavior away from the morality primes.

We suggested an interpretation of the latter finding in terms of an expectation formation process. We reasoned that the priming of morality concepts may have led high consistent pro-selfs to expect more cooperation from their partners and to exploit them as a result of this impression. Results of Experiments 2, 3, and 4 confirmed our reasoning. Expectations about the partner's cooperation were significantly influenced both by participants' social value orientation and the nature of the supraliminal (Experiments 2 and 4) or subliminal (Experiment 3) primes. However, although correlations between the expectation and cooperation measures were significantly positive in all conditions, they came out significantly negative for high consistent pro-selfs primed with morality related words. This is an important finding because it shows that high consistent pro-selfs became less cooperative as they expected more cooperation from their partner. It is noteworthy that the formation of expectations occurred in a very spontaneous manner in the present research. This can be illustrated by the fact that, although expectations were measured in Experiment 2 but not in Experiment 1, we obtained the same pattern of data in both experiments. Moreover, expectations were elicited in very unobtrusive ways in the present studies (see, e.g., Experiment 3, which used a subliminal priming technique).

As a whole, the present findings suggest that dispositional and situational influences may not directly affect people's cooperative behavior in mixed-motive interdependence situations. Rather, these factors may guide people's impressions about their partner, and these impressions may in turn determine people's behavioral options. This suggestion is perfectly in line with previous empirical and theoretical work (e.g., Kelley & Stahelski, 1970; Kelley & Thibaut, 1978; Kuhlman & Wimberley, 1976; Van Lange & Kuhlman, 1994), suggesting that expectations about the partner's cooperation is a crucial antecedent of cooperative decision making in mixed-motive situations.

Biased Perception

The fact that the present research evidenced behavioral contrastive effects following subliminal priming of traits may have important implications for research on automaticity. In that literature, there has been strong support for the view that subtle situational influences have a direct impact on social behavior without being mediated by impressions of the partner with whom one is interacting (Bargh, 1997; Bargh et al., 1996). Direct influences are assumed to operate via the activation of mentally represented traits, stereotypes, or goals (Bargh, 1997). Recently, it has been argued that some findings obtained within the automatic behavior framework may actually be explained by a *biased perception* principle (see Wheeler & Petty, 2001), which refers to a process

whereby the primes would influence behavior not in an automatic fashion but via the influence they would have on the appraisal of the situation. Our research suggests that biased perception processes may indeed sometimes account for what would otherwise appear as an automatic direct effect on behavior. The fact that the subliminal priming of morality concepts elicited increased cooperation among some participants but decreased cooperation among others provides strong support for this view.

It should be noted that the contrastive influence of the primes obtained for high consistent pro-selfs could not be accounted for by a correction-based process. This correction process is likely to emerge when an individual recognizes the potential of primes to bias behavioral responses (Strack, Schwarz, Bless, Kübler, & Wänke, 1993). Specifically, individuals who enjoy sufficient attentional resources sometimes overcorrect for the mental contamination of the primes in restoring the authenticity of their responses (e.g., Corneille, Vescio, & Judd, 2000; Martin, Seta, & Crelia, 1990; Moskowitz & Skurnik, 1999). In the present research, however, one may wonder how participants could have noticed the contaminating influence of the primes. If correction-based contrast effects have been occasionally reported in studies that relied on the classic Scrambled Sentence Test (Corneille et al., 2000; Moskowitz & Skurnik, 1999), they have not been reported in a study that relied on a subliminal priming task. In addition, one may also wonder why such a correction process would have emerged only after priming with morality concepts, only among high consistent pro-self individuals, and only at the behavioral level. One other possibility is that our morality traits appeared to be more extreme to high consistent pro-selfs than to other participants (because it has been established that extreme primes may sometimes function as a standard of comparison and as such also lead to contrastive judgments). However, recent research by Moskowitz and Skurnik (1999) showed that only extreme exemplars (and not extreme traits) should result in comparison-based contrast effects. In the present study, only traits were activated. For all these reasons, we strongly doubt that a contrast emerged in the present studies because of a correction for mental contamination or because of a comparison-based process. Rather, there are good reasons to think that the high consistent pro-selfs primed with the morality concepts took advantage of a partner who was appraised as particularly cooperative because of the influence of the prime.

Finally, we certainly do not mean to argue that social behavior is alien to automatic influences. Rather, the present research suggests that in some situations biased perception may be the best explanation for behavioral effects that would otherwise appear automatic. Recently, Wheeler and Petty (2001) also suggested that biased perception processes might offer a plausible explanation for some automatic behavior effects and that this explanation should thus be considered and assessed as a plausible alternative. We think future research should pay close attention to this possibility and should design experiments to determine conditions in which primes influence behavioral choices through direct automatic or through mediated processes.

Consistency of Social Value Orientation

Our studies also show that it will be important to consider consistency of social value orientation in future social value orientation research. Previous studies suggest that pro-selfs generally

behave in an individualistic manner. However, it has been proposed that pro-selfs start cooperating when they believe that the partner is a cooperative person and that his or her cooperativeness is due to moral, honest intentions (Van Lange & Kuhlman, 1994; Van Lange & Semin-Goossens, 1998). Our findings suggest that the latter effect may be obtained for low consistent pro-selfs only. Smeesters, Warlop, and Van Avermaet (2002) actually tested this reasoning in a sequential dilemma game by giving participants information about personality characteristics and cooperative intentions regarding their partner. Results showed that low consistent pro-selfs but not high consistent pro-selfs reciprocated the cooperative behavior of a moral person. Hence, pro-self individuals should not be expected to all behave in the same way: The consistency of one's social value orientation does make a difference.

Remarkable in our studies was that high and low consistent pro-socials and low consistent pro-selfs all behaved very similarly in the moral and might priming conditions: They all showed behavior assimilation. However, the absence of any differences is not that remarkable after all. It is clear that all these individuals will generally tend to behave less cooperatively when expecting a lack of cooperation from their partner (to avoid becoming exploited). Furthermore, it has been shown in the literature that most individuals tend to behave cooperatively when expecting cooperation from a moral partner (Van Lange & Kuhlman, 1994; Van Lange & Semin-Goossens, 1998). Our research demonstrated that only high consistent individuals cannot resist the temptation to exploit cooperative others. The fact that high and low consistent pro-socials and low consistent pro-selfs behaved similarly when confronted with a moral cooperative other or a mighty noncooperative other does not mean that these individuals will also behave similarly in situations characterized by other situational features. Recently, Smeesters et al. (2002) found that high consistent pro-socials tend to behave cooperatively in more types of unambiguous situations than low consistent individuals, who in turn tend to behave cooperatively in more types of unambiguous situations than high consistent pro-selfs.

Limitations and Future Research

Before closing, we point out some limitations of our research and future research issues. First of all, although our experimental design and results allow for strong inferences about the mediated nature of the priming effect on behavior, our studies did not examine the specific nature of the mediating process. Future research could examine whether and when the effects are mediated by spontaneous personality impressions versus mere behavioral expectations.

A second limitation is that social value orientation and consistency were assessed shortly before the prisoner's dilemma game, which might have induced demand characteristics. However, previous research showed that social value orientation, measured a substantial amount of time in advance, still affected behavior in the predicted ways (e.g., McClintock & Allison, 1989). Moreover, it should be noted that the observed interaction with unobtrusive priming argues against a demand explanation of our social value orientation results.

A third potential weakness of our experiments is that we used a hypothetical game setting lacking monetary payoffs. Therefore, it

would be fruitful to replicate the present work with more involving dilemma games.

Fourth, our results only hold to single-trial social interactions. Social interactions often comprise more than one confrontation. In that case, individuals are often provided with feedback about their partner's cooperation. This feedback information may then distort the initial beliefs about partner's cooperation, and people might use this information to determine their cooperative behavior. For instance, individuals might use specific norms or strategies (e.g., tit for tat) to deal with partner's cooperation in sequential games. Future research should investigate how long initial beliefs, influenced by social value orientation and primes, will last.

Finally, hawks primed with doves became more hawkish. This result may have far-reaching implications for those interested in encouraging pro-social behavior in broader societal contexts. Further research should therefore pay attention to the generalizability of our experimental game results to situations in which the interdependence as well as the payoffs from cooperation are often less salient.

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