

Personality and Social Psychology Bulletin

<http://psp.sagepub.com/>

Are Social Value Orientations Expressed Automatically? Decision Making in the Dictator Game

Gert Cornelissen, Siegfried Dewitte and Luk Warlop

Pers Soc Psychol Bull 2011 37: 1080 originally published online 25 April 2011

DOI: 10.1177/0146167211405996

The online version of this article can be found at:

<http://psp.sagepub.com/content/37/8/1080>

Published by:



<http://www.sagepublications.com>

On behalf of:



<http://www.sagepub.com>
Society for Personality and Social Psychology

Additional services and information for *Personality and Social Psychology Bulletin* can be found at:

Email Alerts: <http://psp.sagepub.com/cgi/alerts>


Subscriptions: <http://psp.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations: <http://psp.sagepub.com/content/37/8/1080.refs.html>

Are Social Value Orientations Expressed Automatically? Decision Making in the Dictator Game

Personality and Social
Psychology Bulletin
37(8) 1080–1090
© 2011 by the Society for
Personality and Social Psychology, Inc
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0146167211405996
http://psp.sagepub.com


Gert Cornelissen¹, Siegfried Dewitte², and Luk Warlop²

Abstract

Drawing on the social intuitionist model, the authors studied the hypothesis that social value orientations are expressed automatically in behavior. They compared spontaneous and more deliberated decisions in the dictator game and confirmed that social values determine behavior when responses are based on the automatic system. By means of both mediation and experimental analyses, the authors further demonstrate that the automatic expression of social value orientations is mediated by perceptions of interpersonal closeness. A reasoning process can subsequently override these automatic responses and disconnect decisions from perceptions of interpersonal closeness. This results in lower levels of other-regarding behavior, at least for prosocials.

Keywords

dictator game, social dilemma, dual processes, social value orientation, interpersonal closeness

Received September 7, 2010; revision accepted February 22, 2011

Airline safety instructions recommend passengers, in the case of a drop in cabin pressure, to put their own oxygen masks on first, before assisting other people. This makes sense, since it may take too much time for a helpful person to put a fellow passenger's mask in place, resulting in both losing consciousness. Securing one's own oxygen intake first allows one to assist others afterward. From the perspective of standard economic models of behavior, this seems like a strange and redundant recommendation. Under the assumption of self-interest, people should not fail to choose that course of action that maximizes personal utility (i.e., survival) in a moment of danger, without instructions telling them so. The fact that this line is part of the FAA-approved script anyway suggests that in some circumstances it may be a spontaneous response to help others, even at a personal cost.

Now imagine traveling by subway. As the train approaches a station and is about to open its doors, you see a pickpocket fish a woman's wallet out of her purse and walk away. What do you do? Do you bother chasing the thief to recover the wallet, do you yell to alert the victim and bystanders, or do you do nothing at all? Previous research suggests that if you intervene, you will most likely do so immediately. After a moment of hesitation, the likelihood that you will respond at all decreases dramatically (Tykocinski & Pittman, 1998). This is difficult to reconcile with a rational perspective on prosocial behavior. A rational agent's default decision is noncooperation. The decision to help requires a cognitive

operation in which one considers the potential benefit of doing so. Therefore, the likelihood of helping should not decrease over time but remain low, or increase.

In this article we propose and test a different model of prosocial versus self-interested behavior. We test the idea that chronically accessible values to pursue the interest of others or the self are expressed automatically in behavior. The model we propose is consistent with the observations in the above scenarios. According to dual process models, decisions either are based on automatic responses to a situation or, if the decision maker has sufficient cognitive resources and time at his or her disposal and is sufficiently motivated, are based on an additional reasoning process (Chen & Chaiken, 1999; Kahneman, 2003; Sloman, 1996).¹ We argue that chronically accessible values to pursue the interest of others or the self, as captured by the social value orientation (SVO) construct, are expressed automatically in behavior. In other words, we propose that SVO represents interindividual differences in automatic responses in social dilemma situations.

¹Universitat Pompeu Fabra, Barcelona, Spain

²Katholieke Universiteit Leuven, Leuven, Belgium

Corresponding Author:

Gert Cornelissen, Universitat Pompeu Fabra, Department of Economics and Business, Barcelona, Spain
Email: Gert.Cornelissen@upf.edu

We also argue that the spontaneous expression of SVO operates via perceptions of interpersonal closeness. Some people perceive others as close to them and automatically tend to take their interest into account. Other people perceive others as more distant and, as a result, care for themselves primarily. We suggest that when decisions are based on a reasoning process, levels of other-regarding behavior tend to decline, compared to decisions based on automatic judgments. The decision context we study in this article is one in which there is outcome dependence but no outcome interdependence. This means that a decision maker influences the outcomes of himself or herself and of one or more others involved, but the other(s) have no power to influence the outcome of the decision maker. Both scenarios described above share this characteristic. We study behavior in a dictator game (DG) as a simulation of such a context.

Are Social Value Orientations Expressed Automatically?

The conception of man as solely driven by self-interest, *homo economicus* (e.g., Luce & Raiffa, 1957), has been challenged repeatedly over the past 40 years (e.g., Fehr & Fischbacher, 2003; Henrich et al., 1991). Most researchers now accept the existence of prosocial motives, such as pursuing the interests of the collective or seeking equality in resource distributions (Mansbridge, 1990; Sober & Wilson, 1998; Van Lange, 1999). Messick and McClintock (1968; McClintock, 1972) proposed the SVO construct to describe individual differences in the extent to which people take others' outcomes into account when making decisions. SVO refers to a relatively stable preference for a particular pattern of outcome distributions between the self and others. Typically, two major orientations are distinguished (McClintock, 1972; Van Lange & Liebrand, 1991). Prosocials prefer to maximize joint outcomes and maximize equality in outcomes. Proselfs prefer to maximize their personal outcomes either absolutely (individualists) or relatively (competitors). SVO has been shown to predict levels of cooperation when the individual interest is in conflict with the group interest (i.e., social dilemmas), such as traveling by public transport versus taking one's own car to reduce road congestion (Van Lange, Van Vugt, Meertens, & Ruiters, 1998), willingness to pursue the goals of an organization one belongs to at a personal cost (Nauta, De Dreu, & van der Vaart, 2002), willingness to sacrifice in close relationships (Van Lange, Agnew, Harinck, & Steemers, 1997), helping behavior (McClintock & Allison, 1989), and intentions to behave proenvironmentally (Gärbling, Fujii, Gärbling, & Jakobsson, 2003). However, other studies have demonstrated that SVO does not always determine behavior and have identified factors that moderate whether SVOs are expressed in interpersonal dilemmas, such as whether decisions are made by leaders or followers (van Dijk & De Cremer, 2006), the strength of situational norms (de Kwaadsteniet, van Dijk, Wit, & De Cremer, 2006), or whether

a receiver has the power to punish the allocator (van Dijk, De Cremer, & Handgraaf, 2004). As De Cremer and Van Lange (2001) have noted, past research has contributed much to our understanding of how prosocials and proselfs differ in their interpretations of and reactions to others in social dilemmas, but relatively little attention has been devoted to the motivational mechanisms underlying differences in behavior of both groups. One of the goals of this article is to improve our understanding of the mechanism by which one's SVO is expressed.

According to the integrative model of SVO (Van Lange, 1999), prosocials cooperate more than proselfs because they value the total group outcome and equality in outcomes. Economic models assume that self-interest is a fundamental motive in human behavior. This would imply that taking others' outcomes into account requires the execution of some cognitive operation that assesses the benefits of behaving cooperatively and a degree of self-control to resist the temptation to maximize individual gains. We studied whether this assumption holds or whether for some (i.e., prosocials) choosing to achieve a certain level of equality is an automatically expressed preference. Specifically, we test our hypothesis that SVOs represent primary judgments regarding appropriate behavior in situations characterized by a conflict of interest.

The social intuitionist model (Haidt, 2001) states that moral decisions, like the choice between cooperation and defection, are generally the result of quick, automatic evaluations or intuitions. These spontaneous responses are shaped by social and cultural influences that become internalized during the course of personality development. The role of a thinking process is largely restricted to formulating post hoc justifications for a judgment that is based on one's feelings about what is considered right or wrong. Drawing on the social intuitionist model, we suggest that SVOs represent interindividual differences in spontaneous moral judgments. These are quick, automatic judgments in dilemma situations, triggering a tendency either to cooperate (prosocials) or to defect (proselfs). We test this hypothesis in Studies 1, 2b, and 3.

Social Value Orientations and Interpersonal Closeness

Biologists have suggested that one mechanism through which cooperative tendencies have evolved is based on the fact that promoting reproductive success of genetically related individuals benefits the proliferation of shared genes (Hamilton, 1964). The degree of shared genes cannot be detected directly, so organisms have to rely on cues that are associated with genetic commonality (Krebs, 1991), such as kinship, friendship, similarity, and familiarity (Cunningham, 1986; Rushton, Russell, & Wells, 1984). This suggests that humans tend to be more cooperative with those whom they consider to be close to them. Work on social discounting supports this idea (Jones & Rachlin, 2006; Rachlin & Raineri, 1992): People are less willing to forgo a fixed amount of money to benefit

the other, when social distance between themselves and the other increases. In addition, Aron, Aron, Tudor, and Nelson (1991) found that people's decisions in a resource allocation task were more fair when their relationship with the interaction partner was closer. In the context of DGs, Burnham (2003) found that dictators donate higher amounts when they see a photo of the receiver prior to their decision and interpreted that "in certain settings, the ability to identify a recipient (or victim) is an effective proxy for a close relationship" (p. 141). Utz (2004) asked participants to indicate which goals they pursued when making decisions in a give-some dilemma. As expected, she found that prosocials are less motivated to maximize their own but more motivated to maximize others' gains than proselfs. Interestingly, by activating different types of self-construal it was possible to temporarily override the goals participants pursue. Participants whose interdependent self was activated were less concerned with maximizing their own gain and more with their interaction partner's outcomes than participants whose independent self was activated. Insofar as there is a relationship between self-construal and perceived social distance, these results suggest that perceived interpersonal closeness might be a mediator for the effects of SVO, affecting the likelihood that decision makers will be concerned about the other person's well-being.

Another line of research suggests that SVO might be related to perceived closeness because of its relationship with attachment styles (Van Lange, De Bruin, Otten, & Joireman, 1997). Prosocials are more likely to have experienced secure attachments with their primary caregivers. Those are associated with a greater ease of getting close to others. Insecure attachments lead individuals to perceive reluctance of others to get close to them (Ainsworth, Blehar, Waters, & Wall, 1978).

Based on this evidence we suggest that (a) SVO is related to chronic differences in perceived psychological distance with others and (b) this perceived psychological distance explains why prosocials and proselfs differ in the extent to which they take others' outcomes into account. More specifically, we suggest that prosocials chronically perceive "others" to be closer to them and that this causes higher levels of cooperative behavior, compared to proselfs, at least when the decision is spontaneous. In Studies 2a, 2b, and 3 we test this hypothesis. We do so by means of both mediation analyses and experimental design. As far as we are aware, we are the first to investigate the relationship between SVO and perceived closeness.

Study 1

In a first study, we tested our hypothesis that SVOs are expressed automatically in behavior. We observed prosocials' and proselfs' behavior in a DG and compared automatic decisions, isolated by introducing a cognitive load manipulation (e.g., Shiv & Fedorikhin, 1999), to decisions

made in a situation in which participants had the chance to deliberate. When choices are based on automatic judgments, we expect more cooperative behavior from prosocials than from proselfs. We also have two reasons to expect that dictators tend to become more selfish when they have the chance to deliberate. First, previous research indicates that self-interested motives are very salient when contemplating a decision in a social dilemma situation (Roch, Lane, Samuelson, Allison, & Dent, 2000). This implies that dictators are very sensitive to justifications that allow them to deviate from the distribution proposed by their automatic system and give in to self-serving temptations (see also Mazar, Amir, & Ariely, 2008). Second, previous research has shown that in social dilemmas, individuals' behavior is determined by both their social values and their expectations about what other people would do in a similar situation (Smeesters, Warlop, Van Avermaet, Corneille, & Yzerbyt, 2003; Van Lange & Kuhlman, 1994). Both the search for justifications and expectations of others' behavior are likely to be affected by what Miller (1999) named "the norm of self-interest." In Western cultures a norm prevails that says that self-interest ought to be a powerful determinant of behavior. Dictators might argue internally that it is appropriate to comply with this norm or might use it as a justification for selfish decisions. Alternatively, awareness of this norm may lead players to expect that others would behave selfishly in the role of the dictator. When they expect selfish behavior of others in a social dilemma, prosocials tend to override their initial cooperative inclination to match that expected behavior (e.g., Kelley & Stahelski, 1970). In the current study we verify whether our prediction that contemplation results in more selfish behavior is correct. Note that such contemplation requires cognitive elaboration on the decision situation and can occur only when the dictator has sufficient cognitive resources at his or her disposal. In short, we predict that when prosocials have the opportunity to reason, levels of other-regarding behavior will be lower than when they are based on the automatic system. Proselfs are unlikely to find reasons to increase their level of other-regarding behavior when contemplating their choice, so we predict that they will act equally self-interested, regardless of whether they are cognitively distracted or not.

Method

Participants and design. Participants were 160 undergraduate students (64 male, 96 female) who participated in partial fulfillment of a course requirement. The experimental design included two between-subjects factors. We measured SVO (prosocial vs. proself) and manipulated cognitive distraction (distraction vs. no distraction). We measured cooperative behavior by counting the number of coins participants allocated to the receiver in a DG.

Procedure and materials. Participants came to the lab in groups of eight and were seated individually in front of a

computer screen in semiclosed cubicles. After a short introduction to the procedure they were expected to follow in the next hour, they completed the DG. Participants learned that they were to keep any money they gained from this transaction. They were explained that they would be randomly paired with an interaction partner. Although the instructions indicated that random drawing would decide which of both partners would be the dictator and who would be the receiver, all participants were assigned to play the role of dictator. In fact, participants were not paired, but all played with a computer program. Before mentioning whether the participants would be dictator or receiver and before specifying the amount of money they would be playing for, we administered the cognitive distraction manipulation. Subsequently, participants received five coins of € .20 and were asked to decide on the allocation of these resources between themselves and their interaction partner. We kept the size of the endowment low because prior research has demonstrated that dictators' decisions are relatively insensitive to the size of the endowment. What seems to matter are differences in relative gains rather than in absolute gains (Carpenter, Verhoogen, & Burks, 2005; Forsythe, Horowitz, Savin, & Sefton, 1994). Then, after 25 minutes of unrelated filler tasks, they completed the Ring Measure of Social Values.

Cognitive distraction manipulation. Before playing the DG, half of the participants were instructed to memorize a random seven digit number (5684524); the others remembered an easier, structured sequence of seven digits (1234567). The number remained on the screen for 8 seconds. Keeping a random number active in working memory taxes cognitive resources and thereby prevents active contemplation of the decision. Memorizing the structured sequence is not effortful, allowing for remaining reasoning capacity. After playing the DG, participants were asked to reproduce the number they had memorized. The data of one participant who failed to reproduce the number correctly were discarded.

Ring Measure of Social Values. We measured SVO using the Ring Measure of Social Values (Liebrand, 1984). This measure contains 24 items, each representing two imaginary money distributions between the self and another person. Participants were asked for each item to indicate which distribution they preferred. They were instructed to imagine that they played with an anonymous person who received the same questions and that individual outcomes were determined by the choices that both players made. Amounts of money can be positive or negative. Distributions are selected from a circle in the own–other outcome plane defined by two orthogonal dimensions. One represents the outcomes for the self and the other represents outcomes for the other. The center of the circle coincides with the origin of the outcome plane (of which the coordinates are €0 for the self and €0 for the other), and its radius is €150. On the circle 24 equidistant points are selected. Each point represents a distribution between the self and the other. Each item in the measure contains two such points, which are located adjacent on the

circle. An example of an item is a choice between Alternative A, €130 for the self and €75 for the other, and Alternative B, €145 for the self and €39 for the other. After making the 24 choices, we calculated the total amount of money allocated to the self and the total amount of money allocated to the other. These two numbers 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 vector in the outcome plane. Each vector reflects a unique pattern of choices. Based on their choices, participants are classified according to their SVO. Participants with vectors falling between 22.5° and 112.5° are classified as prosocials, and participants with orientation vectors falling between 292.5° (or –67.5°) and 22.5° are classified as proselves. Of 159 participants, there are 80 prosocials, 70 proselves, 4 are unidentified, and 5 have a low consistency score and are also discarded. The SVO of 4 participants (2.52%) could not be identified because they had an orientation vector of exactly 22.5° or because the vector was out of range (more than 112.5°). The Ring Measure data also allow calculating the length of each vector, which is an index for the consistency with which the SVO is manifested (Hertel & Fiedler, 1998). A maximal consistency score implies that the participant's preferred orientation on the Ring Measure remains consistent across all trials (Liebrand, 1984). The consistency score is expressed as a percentage representing the ratio of the length of a vector, compared to the maximal length a vector can have. Usually, only the data of those participants with a consistency index higher than 60% are retained for analysis (Liebrand, 1984; Smeesters et al., 2003). Five participants (3.13%) had a consistency score lower than 60% and were discarded from further analysis.

Results

Analyses were performed on remaining 150 participants (70 prosocials and 80 proselves). An ANOVA revealed a significant main effect of SVO on the number of coins allocated to the receiver, $F(1, 146) = 7.92, p < .01$. Prosocials ($M = 2.15, SD = 0.96$) allocated more to the receiver than proselves ($M = 1.68, SD = 1.08$). We did not find a main effect of cognitive distraction, $F < 1$. The main effect of SVO was, however, qualified by a significant interaction effect of SVO and cognitive distraction, $F(1, 146) = 7.10, p < .01$. As expected, we found a significant effect of SVO when participants were distracted and made automatic decisions, $F(1, 146) = 14.52, p < .01$, with prosocials ($M = 2.45, SD = 0.95$) allocating more coins to the receiver than proselves ($M = 1.53, SD = 0.97$). When participants were not distracted, we did not observe differences between prosocials ($M = 1.85, SD = 0.91$) and proselves ($M = 1.83, SD = 1.20; F < 1$). From the other perspective, when not distracted, prosocials allocated significantly fewer coins to the other than in the condition where they were cognitively distracted, $F(1, 146) = 5.91, p < .01$. Donations of

proselfs did not differ between the distraction and the no distraction conditions, $F(1, 146) = 1.69, p = .20$.

Discussion

The results of this study support our hypothesis that SVOs are expressed automatically in decisions in the DG. When participants were cognitively distracted and based their decisions on automatic judgments, prosocials were more generous than proselfs. In the condition in which participants had the chance to deliberate, however, prosocials seemed to override this initial inclination and reduced their level of generosity. When they were not distracted, they allocated as few coins to the receiver as did proselfs.

Study 2

As we discussed above, we propose that perceived interpersonal closeness mediates the automatic expression of SVO in behavior. We tested this hypothesis in two parts (Study 2a and Study 2b). In Study 2a, we verified whether prosocials and proselfs indeed chronically differ regarding how close they perceive "other people" to be to them. To that end, we measured participants' SVO and asked them to indicate how close they perceived their relationship to be with the interaction partner they had to imagine playing with in the Ring Measure. In a second step, we tested the mediation hypothesis itself (Study 2b).

Study 2a

Method

Participants and procedure. Participants were 108 undergraduate students (59 male, 49 female) who participated in partial fulfillment of a course requirement. They came to the lab in groups of 5 to 8 and were seated individually in front of a computer screen in semiclosed cubicles. First they completed the Ring Measure of Social Values and a measure of interpersonal closeness. The order of both measures was counterbalanced. This took about 10 to 15 minutes, after which they continued with other tasks unrelated to this study.

Inclusion of Other in the Self Scale. We measured interpersonal closeness using the Inclusion of Other in the Self Scale (IOS Scale; Aron, Aron, & Smollan, 1992). This is a single-item, pictorial measure of closeness. In the IOS Scale, respondents select the picture that describes their relationship with an interaction partner best, from a set of Venn-like diagrams, each representing different degrees of overlap of two circles. One circle represents the self (S), and the other represents the other person (O). The figures are designed so that the degree of overlap progresses linearly, creating a seven-step, interval-level scale. The anchors are, at one end, two circles that touch each other but do not overlap and, at the other end, two circles overlapping

completely. The order in which the Ring Measure and the IOS Scale were administered was counterbalanced. In both cases, we first presented the instructions for the Ring Measure, including the information that participants had to imagine playing with an anonymous person who received the same items. Then, half the participants completed the IOS Scale first, in which case they were asked to describe their relation with the person with whom *they were about to interact*. The other half indicated, after completing the Ring Measure, how they perceived their relationship with the partner with whom *they just interacted*. We did not find any effect of the position of both measures, so it is not considered in further analyses.

Results and Discussion

Of the 108 participants, 29 (26.85%) could be identified as prosocials and 71 (65.74%) could be identified as proselfs. Such a skewed distribution is not uncommon (Liebrand & McClintock, 1988; Sheldon, Arndt, & Houser-Marko, 2003). The SVO of 4 participants (3.70%) could not be identified because they had an orientation vector of exactly 22.5° or because the vector was out of range. Data of 4 additional participants (3.70%) were discarded from further analysis because their consistency score was lower than 60%.

We conducted an ANOVA to verify whether prosocials and proselfs have a different perception of the closeness of their relationship with the anonymous interaction partner in the Ring Measure. Results indicated this is the case, $F(1, 98) = 18.32, p < .01$. Prosocials indicated to feel closer ($M = 4.52, SD = 1.30$) than proselfs ($M = 2.99, SD = 1.74$). We also controlled for gender effects, but did not find a main effect, $F(1, 95) < 1$, or an interaction effect of gender and SVO, $F(1, 95) < 1$. An alternative, continuous measure for SVO consists of using the vector angle associated with a participant's answer profile in the Ring Measure. Higher numbers indicate a larger concern for the payoffs of the interaction partner. We calculated the correlation between this vector angle and closeness. That correlation was significant, $r(100) = .48, p < .01$, indicating again that perceiving an interaction partner as closer to the self is associated with a higher concern for the other's outcomes. In this study we confirmed that SVO is indeed associated with chronic differences in perceived interpersonal closeness with an anonymous interaction partner. Prosocials perceive the social distance between themselves and unknown others as smaller than proselfs.

Study 2b

The goal of this study was twofold. First, we expected to replicate the findings of Study 1, and second, we tested our hypothesis that the automatic expression of SVOs is mediated by perceived interpersonal closeness. To do so, we ran

a design that was identical to Study 1 and included a measure for perceived interpersonal closeness.

Method

Participants and design. Participants were 109 undergraduate students (36 male, 73 female) who participated in partial fulfillment of a course requirement. The experimental design was identical to that of Study 1. This time we also measured interpersonal closeness, using the IOS Scale.

Procedure and materials. Participants came to the lab in groups of eight and were seated individually in front of a computer screen in semiclosed cubicles. After a short introduction to the procedure they were expected to follow in the next hour, they completed the DG. The only difference between this game and the one in Study 1 is that participants now received 11 coins of €10 instead of 5 coins of €20 to increase potential variance in behavior. The manipulation of cognitive distraction was identical to the one in Study 1. After choosing the number of coins allocated to the receiver, participants were asked to indicate how close they perceived their relationship with the receiver to be, using the IOS Scale. After 25 minutes of unrelated filler tasks, respondents completed the Ring Measure of Social Values.

Results

Of the 109 participants, 36 could be identified as prosocial (33.03%) and 73 as proself (66.97%). Data of 5 participants (4.59%) were discarded from further analysis because their consistency score was lower than 60%, and data of 2 additional participants were discarded for failing to reproduce the correct number they were asked to memorize (1.83%). This way, 102 observations (34 prosocial, 68 proself) remained for further analysis.

Gender was not related to perceived closeness, $F(1, 100) = 1.19, p = .28$. Replicating Study 2a, an ANOVA revealed that SVO was related to perceived interpersonal closeness, $F(1, 98) = 23.99, p < .01$ (see Figure 1). Prosocials indicated feeling closer to the unknown interaction partner ($M = 5.47, SD = 1.26$) than did proselfs ($M = 3.88, SD = 1.72$). There was no main effect of distraction on perceived closeness, $F(1, 98) = 1.88, p = .17$, and the interaction effect of SVO and distraction was not significant either, $F(1, 98) = 1.40, p = .24$. Furthermore, we replicated the interaction effect of Study 1, $F(1, 98) = 5.50, p < .02$ (see Figure 2). When distracted, prosocials ($M = 5.50, SD = 0.89$) allocated more coins to the receiver than proselfs ($M = 3.56, SD = 2.87$), $F(1, 98) = 6.88, p < .01$. In the no distraction condition, we did not find a difference between prosocials ($M = 3.78, SD = 2.21$) and proselfs ($M = 4.22, SD = 2.51; F < 1$). Prosocials allocated fewer coins to the receiver when they were not distracted, compared to the distraction condition, $F(1, 98) = 4.31, p < .04$. Donations of proselfs did not differ between distraction conditions, $F(1, 98) = 1.27, p = .26$. There were

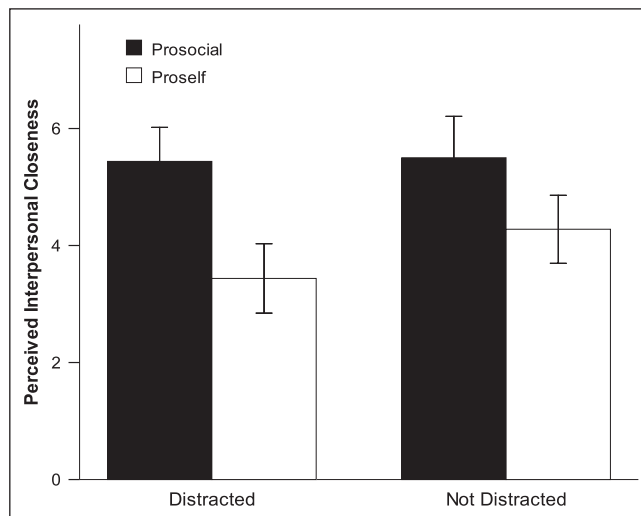


Figure 1. The relationship between social value orientation and perceived interpersonal closeness (Study 2b)

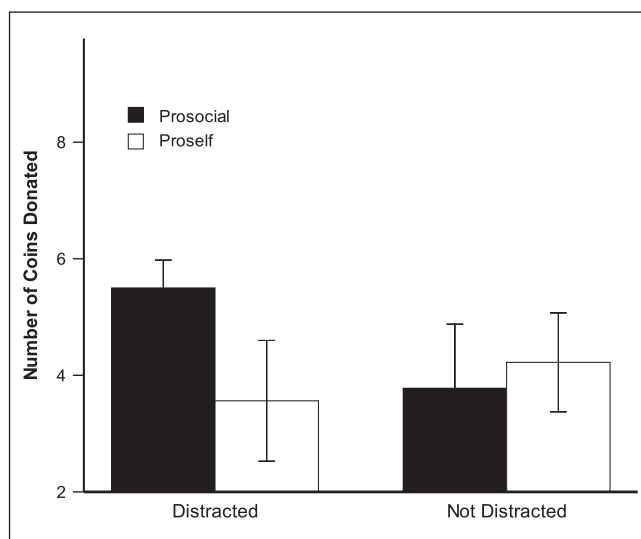


Figure 2. The effect of social value orientation and distraction on decision making in the dictator game (Study 2b)

no main effects of SVO, $F(1, 98) = 2.16, p = .15$, nor of distraction, $F(1, 98) = 1.09, p = .30$.

To verify our hypothesis that interpersonal closeness mediates the effect of SVO on donations in the distraction condition but not in the no distraction condition, we used a bootstrapping procedure developed by Preacher, Rucker, and Hayes (2005).² The ordinary least squares regression model indicated that SVO (with 0 for prosocials and 1 for proselfs) was related to interpersonal closeness, $t(100) = -4.77, p < .01$. The interaction effect of closeness and distraction on number of coins allocated to the receiver was significant,

$t(97) = -3.22, p < .01$. In the distraction condition, the bootstrapped estimate of the indirect effect of SVO on number of coins donated, via interpersonal closeness, was significant ($Z = -2.90, p < .01$). The correlation between perceived interpersonal closeness and number of coins donated was significant as well, $r(48) = .54, p < .01$. In the no distraction condition, the indirect effect was not significant ($Z = 0.45, p = .66$). In this case, perceived interpersonal closeness was not related to the number of coins donated, $r(54) = -.06, p = .65$.

Discussion

We provided support for our hypothesis that the automatic expression of SVO is at least partly the result of a differential perception of the closeness of one's relationship with an anonymous interaction partner. When we provoked automatic decisions in the interdependence situation by imposing a cognitive distraction, participants expressed their SVO. The effect was mediated by the perceived interpersonal closeness. However, when dictators had the chance to contemplate their decision, prosocials behaved less generously than when deciding automatically and behaved similar to proselves. In this condition perceived closeness was not related to the number of coins passed through.

Study 3

In this study we wanted to provide additional evidence for our hypothesis that perceived interpersonal closeness influences donation behavior in the DG, but only when the decision is based on an automatic judgment (i.e., when distracted). In Study 2b we measured SVO and showed that its influence on decision making is mediated by perceived interpersonal closeness, at least when choices are not deliberated. However, it remains possible that perceived interpersonal closeness is only a proxy for the process that links SVO to donation behavior (Spencer, Zanna, & Fong, 2005). To further corroborate the causal role of closeness, we manipulated it. We did so by identifying the receiver in a DG as a person who was either similar or dissimilar to the dictator with respect to the daily activities he or she engages in. We expect participants to feel closer to people who have a similar lifestyle. Furthermore, we predict that manipulated interpersonal closeness should influence donation amounts only when the possibility of deliberating is constrained and choices are made automatically. If participants have the chance to deliberate, we expect those who feel close to the receiver to cooperate less, compared to when they make automatic decisions. Therefore, we predict an interaction effect between manipulated closeness and cognitive distraction, analogous to the interaction effects between SVO and cognitive distraction in Studies 1 and 2b.

Method

Participants and design. The participants were 171 undergraduate students (44 male, 127 female). They were paid €6 for participating for 1 hour in a series of studies. The experimental design included two between-subjects factors: perceived interpersonal closeness (distant vs. close) and cognitive distraction (distraction vs. no distraction).

Procedure and materials. Participants came to the lab in groups of eight and were seated individually in front of a computer screen in semiclosed cubicles. After a short introduction, they completed a 15-item questionnaire. Items probed how often participants engaged in certain leisure and other activities, such as how often they watch the news, go to the movies, go shopping, buy CDs, and engage in sports and how much they spend monthly using their cell phone. After 15 minutes of filler tasks, participants played a DG. Instructions were mostly identical to the ones used in Study 2b, apart from the identification of the interaction partner. Instead of being explained that they would play with a randomly chosen participant in the same session, they learned that they would play with that participant whose answers on the 15-item questionnaire resembled their own response profile most (close condition) or least (distant condition). Cognitive distraction was manipulated in the same way as in previous studies. All participants correctly reproduced the number they were asked to memorize.

Results

We conducted a 2 (closeness) by 2 (cognitive distraction) ANOVA on the number of coins donated to the receiver. We found a main effect of the closeness manipulation ($M_{\text{close}} = 4.49, SD = 1.77, M_{\text{distant}} = 3.90, SD = 1.74, F(1, 167) = 6.78, p < .01$, but not of cognitive distraction, $F(1, 167) = 2.67, p = .10$. This main effect was qualified by a significant interaction, showing the same pattern as those in Study 1 and 2b, $F(1, 167) = 7.18, p < .01$. In the distraction condition, we found a significant effect of the closeness manipulation, $F(1, 165) = 12.89, p < .01$. Those in the close condition ($M = 5.14, SD = 1.46$) allocated more coins to the receiver than those in the distant condition ($M = 3.74, SD = 1.85$). In the no distraction condition, there was no effect of closeness ($M_{\text{close}} = 4.00, SD = 1.83, M_{\text{distant}} = 4.02, SD = 1.66; F < 1$). Those in the close condition allocated significantly fewer coins to the receiver when they had the chance to deliberate their decision than when they were distracted, $F(1, 165) = 9.26, p < .01$. We found no effect of distraction on participants in the distant condition, $F < 1$.

Discussion

This study provides additional evidence for our hypothesis that perceived interpersonal closeness mediates the automatic expression of SVO on behavior in interdependence

situations, by establishing the causal role played by closeness perceptions. Manipulating interpersonal closeness influenced allocation decisions in a DG when decisions were based on automatic judgments. Those who perceived the other as closer allocated more resources to the receiver. When participants had the chance to deliberate, the effect of the closeness manipulation disappeared, as did the effect of SVO in Studies 1 and 2b. This means that not only internalized long-term values (e.g., SVO) but also momentarily manipulated perceptions of the interaction partners can influence behavior automatically.

General Discussion

We tested the hypothesis that SVO, as a measure of chronically accessible goals to pursue the interest of others or the self, is expressed automatically in behavior. A first study suggested that this is indeed the case. In a DG, when decisions were made automatically, prosocials allocated more resources to the receiver than did proselves. When cognitive resources were not taxed, prosocials reduced their generosity to the level of proselves, whose behavior did not change. We replicated these results in Study 2b. In addition, we hypothesized that perceived interpersonal closeness is a mediator for the automatic expression of SVO. In Study 2a we established that there is a relationship between both. Prosocials perceive random other people to be closer to them than proselves. In Study 2b we confirmed that the automatic expression of SVO on allocation decisions is mediated by the perceived interpersonal closeness of the interaction partner. In Study 3 we further corroborated the causal role of closeness by manipulating it and replicating the pattern of results of Studies 1 and 2b. To our knowledge, these are the first studies to establish the relationship between SVO and interpersonal closeness and its mediating role in determining prosocial behavior.

Generalization to Other Social Dilemma Situations

Our data suggest that people's other-regarding or self-regarding values, as measured by SVO, are expressed automatically in decisions in the DG. One could wonder whether our findings would generalize to real-life situations. We would argue that they would, for several reasons. First, prior research has provided ample empirical evidence showing that SVO predicts cooperative choices in many life domains (Gärling et al., 2003; McClintock & Allison, 1989; Nauta et al., 2002; Van Lange, Agnew, et al., 1997). Second, it has been argued that in most daily situations a large number of stimuli compete for our limited cognitive resources, and behavior is therefore often executed rather automatically (e.g., Bargh & Chartrand, 1999; Gilbert & Osborne, 1989). In addition, many social dilemma situations require very quick decisions, which promotes automatic decision making.

The decision whether to stop and talk to a street campaigner who, you know, will ask for a charity donation and the decision to comply with a request for a favor from a colleague are usually made in a split second, precluding an extensive reasoning process. Third, the transparent nature of gains and losses in the DG might artificially stimulate contemplation of the decision at hand. In real-life situations, payoff structures might be less transparent, discouraging an analysis in terms of costs and benefits. For these reasons we think that SVO, as a measure of cooperative values, does influence our behavior in a considerable number of real-life situations. This does not mean that our findings in the DG generalize to every context. Emphasizing three characteristics of the DG may help to conjecture in which situations our model would hold. First, in the DG, there is no commonly agreed on standard for what would constitute fair behavior. Although we would suggest that the same is true for many real-life situations, our model might not fit situations in which such fairness standards are available. If a group of friends habitually splits the bill after an evening out, it is clear what each person's fair contribution would be. In such a situation, people are likely to override dispositional tendencies and follow the group norm (de Kwaadsteniet et al., 2006). Second, in the DG, the personal material benefit of allocating money to the receiver is zero. Pursuing the interest of others does not yield personal gains. In situations of interdependence, like in an ultimatum game or prisoner's dilemma game, an individual's outcomes are dependent on what other players do. In those games, or the real-life situations that resemble them, it may be in a person's self-interest to behave cooperatively for strategic reasons. The cooperative act may set off reciprocal acts that benefit both individuals. In such a situation, our model would not hold. Instead, we would predict cognitive elaboration to lead to higher levels of cooperative behavior. Helping my neighbor jump-start his car might ensure a reciprocal act when my own battery is dead. Third, we assumed that social norms exist that prescribe selfish behavior. When we asked our participants how many coins they *expected other dictators to allocate to the receiver*, on average their answer was 3.78 out of 11 coins. Giving 34% of one's endowment to an unknown other can hardly be called strict selfishness. It is a smaller amount, however, than what prosocials and those who feel close to the receiver spontaneously decided to give. Therefore, we can expect that in a situation where social norms or expectations exist that most people do behave in the interest of others, contemplating one's decision might actually increase, and not decrease, other-regarding behavior. In such situations where the group norm refers to high levels of cooperative behavior, our model would not hold.

In short, we suggest that our model may be valid for the many daily life contexts that de facto share these characteristics with the DG: the absence of an objective indicator of appropriate behavior, a negligible personal material benefit of cooperation, and the absence of a social norm prescribing

prosocial behavior. Of course, there are contexts in which not all these features are present. Previous research has documented situations in which other dual process models involving SVO are applied.

Other Dual Process Models of Other-Regarding Behavior

For example, Roch et al. (2000) found that in resource games, participants automatically anchor on their fair share, and when they contemplate their decisions, they become more selfish. Unfortunately the data do not allow for a comparison of the size of this selfish adjustment by prosocials and proselves, although proselves expressed more motivated thought toward deviating from their fair share. As we indicated before, the "fair share" constitutes a clear group norm. When it is clear what that fair share is, behavior will likely match it, for both prosocials and proselves. In a resource game, one's fair share is obvious: the size of the resource divided by the number of players. There is also a strong group norm to take not more from the shared resource than the fair share. This suggests that the salience and transparency of the cooperative norm will determine whether individual chronic values will be expressed under cognitive load.

Another pattern is found in van den Bos, Peters, Bobocel, and Ybema (2006). In their studies, participants indicated how satisfying a given, personally advantageous, resource distribution was. They report that people judge advantageous inequity to be more satisfying when judgments are made automatically than when they are based on a thinking process. They concluded that evaluating an advantageous outcome positively is automatic, whereas taking fairness concerns into account requires a reasoning process. Several differences between the decision situations in van den Bos et al. and ours may be responsible for the alternative decision-making process. A very important difference is that in the DG, participants have to make active decisions regarding resource allocations, whereas in van den Bos et al.'s procedure, participants had to judge satisfaction with given distributions. These two judgments are likely to activate different mental concepts and different types of evaluations. Participants in our studies had to take responsibility for the resource allocation they decided on, whereas the participants in the van den Bos study had no power over the decision. If one has no power over a decision, one cannot be held accountable for a certain resource allocation, not by others nor by the self. In this case, one's self-perception "as a fair person" is not threatened when the allocation is unfair. We agree with van den Bos et al. that future research should further specify models related to people's implicit preferences and the effect of a reasoning process. It should search for the nature of the moderators and characteristics of a context that determine which model predicts behavior in a certain social dilemma situation better. We have indicated the three characteristics that are likely to be essential for our model to apply.

Limitations and Future Research

Our data suggest that when people's automatic responses are prosocial, contemplating a decision in a social dilemma situation is likely to promote more self-interested behavior. It is not clear, however, what exactly happens during the contemplation process and why it leads to more selfish choices. Possibly, what takes place is motivated reasoning. When dictators have sufficient cognitive resources to deliberate their decisions, they may make a case for pursuing self-serving temptations without damaging their self-concept as a fair individual, which overrides the effects of closeness and, by extension, SVO. Alternatively, it is possible that dictators, when deliberating their choice, do not find a justification to allocate a substantial amount to the receiver. Perhaps their adherence to the norm of self-interest prevents prosocials from following their first inclination. If this is true, then prosocials might decide to be more generous if a cue is available that would justify them to do so (Holmes, Miller, & Lerner, 2002). Third, cognitive activity may be devoted to forming expectations of what others would do in a similar situation. Subsequently, they match those expectations. When choices are made spontaneously, on the other hand, prosocials do not take these expectations into account (or, more exactly, do not form such expectations) and base their decisions on their SVO. As a result, they allocate a larger amount to the receiver. In fact, several of these accounts could be valid and operate in parallel. Another limitation was the fact that the size of the endowment that dictators divided was rather small in our studies. Future research should verify whether the current model holds over a range of endowment sizes.

Considering the common assumption that many of the judgments and decisions we make are automatic (e.g., Bargh & Chartrand, 1999), and our finding that other-regarding goals may be expressed automatically, from a public policy perspective it might be interesting to study how the promotion of other values can lead to them being automatically expressed in behavior. Many individuals struggle to pursue long-term self-interested goals, such as being fit and healthy, or other-regarding goals, such as protecting the environment or making ethical decisions, in the presence of tempting alternatives (such as fatty food or cheap but polluting consumer products). If adopted values over time get to be expressed automatically (just like other-regarding preferences for prosocials), it may become much easier for people to pursue their long-term goals, as it would no longer be necessary to perform effortful control strategies to do so. In that case, the harmful alternatives would simply not be considered or would be considered unattractive. If the expression of long-term goals remains the task of our reasoning system, we are condemned to a struggle of resisting temptations through self-control. It is likely, however, that both systems are involved. Adopting a new value might be like learning to drive a car. Initially, it is under the control of our reasoning

system, but after training the execution migrates to the automatic system (Dewitte, Bruyneel, & Geyskens, 2009). Future research might help us understand these issues and make suggestions on how to pursue long-term goals successfully.

Acknowledgments

For helpful feedback on previous drafts, we are grateful to associate editor Heejung Kim and two anonymous reviewers.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by KULeuven University Grant OT/07/13, Spanish Ministry of Science and Innovation Grant ECO2008-01768, and Belgian Science Policy Grant CP/15.

Notes

1. In the remainder of the article, we use the formulation “automatic decisions” to refer to “decisions based on automatic responses.”
2. We used this procedure instead of the mediation test proposed by Baron and Kenny (1986) because it allows us to test the predicted mediated moderation directly.

References

- Ainsworth, M., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of Other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*, 596-612.
- Aron, A., Aron, E. N., Tudor, M., & Nelson, G. (1991). Close relationships as including other in the self. *Journal of Personality and Social Psychology*, *60*, 241-253.
- Bargh, J. A., & Chartrand, T. L. (1999). The unbearable automaticity of being. *American Psychologist*, *54*, 462-479.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173-1182.
- Burnham, T. C. (2003). Engineering altruism: A theoretical and experimental investigation of anonymity and gift giving. *Journal of Economic Behavior & Organization*, *50*, 133-144.
- Carpenter, J., Verhoogen, E., & Burks, S. (2005). The effect of stakes in distribution experiments. *Economics Letters*, *86*, 393-398.
- Chen, S., & Chaiken, S. (1999). The heuristic-systematic model in its broader context. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 73-96). New York, NY: Guilford.
- Cunningham, M. R. (1986). Levites and brother’s keepers: A sociobiological perspective on prosocial behavior. *Humboldt Journal of Social Relations*, *13*, 35-67.
- De Cremer, D., & Van Lange, P. A. M. (2001). Why prosocials exhibit greater cooperation than proselves: The roles of social responsibility and reciprocity. *European Journal of Personality*, *15*(S1), S5-S18.
- de Kwaadsteniet, E. W., van Dijk, E., Wit, A., & De Cremer, D. (2006). Social dilemmas as strong versus weak situations: Social value orientations and tacit coordination under resource size uncertainty. *Journal of Experimental Social Psychology*, *42*, 509-516.
- Dewitte, S., Bruyneel, S., & Geyskens, K. (2009). Self-regulating enhances self-regulation in subsequent consumer decisions involving similar response conflicts. *Journal of Consumer Research*, *36*, 394-405.
- Fehr, E., & Fischbacher, U. (2003). The nature of human altruism. *Nature*, *425*(6960), 785-791.
- Forsythe, R., Horowitz, J. L., Savin, N. E., & Sefton, M. (1994). Fairness in simple bargaining experiments. *Games and Economic Behavior*, *6*, 347-369.
- Gärling, T., Fujii, S., Gärling, A., & Jakobsson, C. (2003). Moderating effects of social value orientation on determinants of proenvironmental behavior intention. *Journal of Environmental Psychology*, *23*, 1-9.
- Gilbert, D. T., & Osborne, R. E. (1989). Thinking backward: Some curable and incurable consequences of cognitive busyness. *Journal of Personality and Social Psychology*, *57*, 940-949.
- Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review*, *108*, 814-834.
- Hamilton, W. D. (1964). The genetical evolution of social behaviour. I. *Journal of Theoretical Biology*, *7*, 1-16.
- Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., & McElreath, R. (1991). In search of homo economicus: Behavioral experiments in 15 small-scale societies. *American Economics Review*, *91*, 73-78.
- Hertel, G., & Fiedler, K. (1998). Fair and dependent versus egoistic and free: Effects of semantic and evaluative priming on the “Ring Measure of Social Values.” *European Journal of Social Psychology*, *28*, 49-70.
- Holmes, J. G., Miller, D. T., & Lerner, M. J. (2002). Committing altruism under the cloak of self-interest: The exchange fiction. *Journal of Experimental Social Psychology*, *38*, 144-151.
- Jones, B., & Rachlin, H. (2006). Social discounting. *Psychological Science*, *17*, 283-286.
- Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, *58*, 697-720.
- Kelley, H. H., & Stahelski, A. J. (1970). Social interaction basis of cooperators’ and competitors’ beliefs about others. *Journal of Personality and Social Psychology*, *16*, 66-91.
- Krebs, D. L. (1991). Altruism and egoism: A false dichotomy? *Psychological Inquiry*, *2*, 137-139.
- Liebrand, W. B. G. (1984). The effect of social motives, communication and group size on behaviour in a N-person multi-stage mixed motive game. *European Journal of Personality*, *14*, 139-364.

- Liebrand, W. B. G., & McClintock, C. G. (1988). The Ring Measure of Social Values: A computerized procedure for assessing individual differences in information processing and social value orientation. *European Journal of Personality*, 2, 217-230.
- Luce, R. D., & Raiffa, H. (1957). *Games and decisions: Introduction and critical survey*. New York, NY: Wiley.
- Mansbridge, J. J. (1990). *Beyond self-interest*. Chicago, IL: University of Chicago Press.
- Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of Marketing Research*, 45, 633-644.
- McClintock, C. G. (1972). Social motivation—A set of propositions. *Behavioral Science*, 17, 438-454.
- McClintock, C. G., & Allison, S. T. (1989). Social value orientation and helping behavior. *Journal of Applied Social Psychology*, 19, 353-362.
- Messick, D. M., & McClintock, C. G. (1968). Motivational bases of choice in experimental games. *Journal of Experimental Social Psychology*, 4, 1-25.
- Miller, D. T. (1999). The norm of self-interest. *American Psychologist*, 54, 1053-1060.
- Nauta, A., De Dreu, C. K. W., & van der Vaart, T. (2002). Social value orientation, organizational goal concerns and interdepartmental problem-solving behavior. *Journal of Organizational Behavior*, 23, 199-213.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2005). *Suggested procedures for addressing moderated mediation hypotheses* (Unpublished working paper). Chapel Hill: University of North Carolina at Chapel Hill.
- Rachlin, H., & Raineri, A. (1992). Irrationality, impulsiveness, and selfishness as discount reversal effects. In G. Loewenstein & J. Elster (Eds.), *Choice over time* (pp. 93-118). New York, NY: Russell Sage.
- Roch, S. G., Lane, J. A. S., Samuelson, C. D., Allison, S. T., & Dent, J. L. (2000). Cognitive load and the equality heuristic: A two-stage model of resource overconsumption in small groups. *Organizational Behavior and Human Decision Processes*, 83, 185-212.
- Rushton, J. P., Russell, R. J. H., & Wells, P. A. (1984). Genetic similarity theory: Beyond kin selection. *Behavior Genetics*, 14, 179-193.
- Sheldon, K. M., Arndt, J., & Houser-Marko, L. (2003). In search of the organismic valuing process: The human tendency to move towards beneficial goal choices. *Journal of Personality*, 71, 835-869.
- Shiv, B., & Fedorikhin, A. (1999). Heart and mind in conflict: The interplay of affect and cognition in consumer decision making. *Journal of Consumer Research*, 26, 278-292.
- Sloman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin*, 119, 3-22.
- Smeesters, D., Warlop, L., Van Avermaet, E., Corneille, O., & Yzerbyt, V. (2003). Do not prime hawks with doves: The interplay of construct activation and consistency of social value orientation on cooperative behavior. *Journal of Personality and Social Psychology*, 84, 972-987.
- Sober, E., & Wilson, D. S. (1998). *Unto others: The evolution and psychology of unselfish behavior*. Cambridge, MA: Harvard University Press.
- Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, 89, 845-851.
- Tykowski, O. E., & Pittman, T. S. (1998). The consequences of doing nothing: Inaction inertia as avoidance of anticipated counterfactual regret. *Journal of Personality and Social Psychology*, 75, 607-616.
- Utz, S. (2004). Self-construal and cooperation: Is the interdependent self more cooperative than the independent self? *Self and Identity*, 3, 177-190.
- van den Bos, K., Peters, S. L., Bobocel, D. R., & Ybema, J. F. (2006). On preferences and doing the right thing: Satisfaction with advantageous inequity when cognitive processing is limited. *Journal of Experimental Social Psychology*, 42, 273-289.
- van Dijk, E., & De Cremer, D. (2006). Self-benefiting in the allocation of scarce resources: Leader-follower effects and the moderating effect of social value orientations. *Personality and Social Psychology Bulletin*, 32, 1352-1361.
- van Dijk, E., De Cremer, D., & Handgraaf, M. J. J. (2004). Social value orientations and the strategic use of fairness in ultimatum bargaining. *Journal of Experimental Social Psychology*, 40, 697-707.
- Van Lange, P. A. M. (1999). The pursuit of joint outcomes and equality in outcomes: An integrative model of social value orientation. *Journal of Personality and Social Psychology*, 77, 337-349.
- Van Lange, P. A. M., Agnew, C. R., Harinck, F., & Steemers, G. E. M. (1997). From game theory to real life: How social value orientation affects willingness to sacrifice in ongoing close relationships. *Journal of Personality and Social Psychology*, 73, 1330-1344.
- Van Lange, P. A. M., De Bruin, E. M. N., Otten, W., & Joireman, J. A. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology*, 73, 733-746.
- Van Lange, P. A. M., & Kuhlman, M. D. (1994). Social value orientations and impressions of partner's honesty and intelligence: A test of the might versus morality effect. *Journal of Personality and Social Psychology*, 67, 126-141.
- Van Lange, P. A. M., & Liebrand, W. B. G. (1991). Social value orientation and intelligence: A test of the goal prescribes rationality principle. *European Journal of Social Psychology*, 21, 273-292.
- Van Lange, P. A. M., Van Vugt, M., Meertens, R. M., & Ruiters, R. A. C. (1998). A social dilemma analysis of commuting preferences: The roles of social value orientation and trust. *Journal of Applied Social Psychology*, 28, 796-820.