A Matter of Time: Does the Impact of Social Value Orientation and Self-Efficacy on Contributions to Public Goods Depend on the Temporal Framing of the Dilemma?

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A Matter of Time: Does the Impact of Social Value Orientation and Self-Efficacy on Contributions to Public Goods Depend on the Temporal Framing of the Dilemma?

Abstract

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Much research indicates that social value orientation, a trait-level preference for self and other outcomes in interdependent situations, predicts cooperation in social dilemmas. Also, perceptions of self-efficacy relate to cooperation in social dilemmas, with low-efficacy predicting low cooperation. The current research predicts that a temporal perspective of a public goods dilemma moderates each of these effects in systematically different ways. Research on Construal Level Theory (CLT) suggests that decision information of distant future events are construed more abstractly than the same information regarding near future events. If distant future decisions facilitate abstract construal of information, then this information may be more readily compared to abstract reference values, such as social values. Also, if a near future perspective facilitates low-level construal of behavioral alternatives, then self-efficacy, which is a feasibility concern, should be more strongly related to cooperative intentions in such perspective, relative to a distant future perspective. The results failed to support both interaction hypotheses and will be discussed in the context of social dilemmas, values, self-efficacy, and CLT.

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Dedication

This dissertation is dedicated to my wonderful family; Gary, Sheryl, Matthew, Brianna, and April Balliet. Your love and support made this achievement possible.

INTRODUCTION

Imagine being called by National Public Radio (NPR) and asked to donate money to keep this public good available to all members of society. Often during these calls the representative asks for a pledge to donate a specified amount of money in the future, noting that a form will be sent in the mail to be retrieved at a later date, when the actual check will be signed and sent back to NPR. In this situation, dispositional social values can have an important role in determining a pledge to contribute (Stouten, De Cremer, & Van Dijk, 2005). However, would the decision differ if asked to donate the money immediately? And if so how? When asked to donate immediately, other more pragmatic considerations (e.g. self-efficacy) may play an important role in determining choice to contribute. The current research tests the notion that the temporal framing of contribution behaviors may have an important effect on when social values and self-efficacy influence contribution behaviors. Since public goods, such as NPR, are dependent on contributions from societal members, it is important for researchers to consider the many possible factors that affect contribution decisions.

Research on public good dilemmas and Construal Level Theory (CLT) suggest some preliminary ideas regarding how temporal framing of the dilemma systematically affects contribution decisions. For example, past research has shown that individual differences in *social value orientation* (SVO), a measure of concern for both self and others outcomes in interdependent social interactions (Messick & McClintock, 1968), is able to predict contribution to public goods (e.g., Stouten, De Cremer, & Van Dijk, 2005. cf. Parks, 1994), even when defection is objectively the most economical course of action (Komorita & Parks, 1996). Self-efficacy (i.e., an individual's perception of the likelihood that their behavior will affect the operation of NPR) also has a positive relationship with cooperative behavior (e.g., De Cremer & van Vugt, 1998; Kerr, 1992; Kerr & Kaufman-Gilliland, 1994). While much

research demonstrates that SVO and self-efficacy predict contributions to public goods, current research should identify the different decision contexts that moderate these effects. So, when do SVO and self-efficacy predict contributions?

Construal Level Theory (CLT) provides important implications for the effects of SVO and self-efficacy on contribution behavior (Trope & Lieberman, 2003). CLT claims that the temporal distance of an event systematically alters the decision making process. When deciding how to act in the distant future, individuals adopt an abstract higher-level construal of decision information that emphasizes desirability features of behavioral alternatives (i.e. what actions achieve my goals?). Conversely, a decision to act in a near future event promotes a concrete low-level construal of decision information that emphasizes feasibility aspects of behaviors (e.what can I actually accomplish?). Following this framework, it is predicted that SVO will have a stronger relationship with contribution decisions in a distant future framing of the contribution, since SVO is an abstract dispositional value that informs desirable ways of behaving. Self-efficacy, however, is predicted to have a stronger relation with contribution decisions in a near future framing of the contribution, since self-efficacy is by definition a feasibility concern (see Figure 1). Below, I review theory and research on social dilemmas, paying particular attention to the role of SVO and self-efficacy. Next, I outline construal level theory and research, and highlight the relevance of CLT within the social dilemma domain. Finally, based on this integration, I derive several hypotheses to be tested in a step-level public goods dilemma.

Social Dilemmas

Social dilemmas are situations in which individual interests conflict with collective interests (Komorita & Parks, 1996). Dawes (1980) outlines two defining attributes of social dilemmas: 1) self-interested actions result in a higher pay-off to the individual, no matter what others choose, and 2) all persons achieve less if everyone decides to act according to

self-interest. Examples of real-life social dilemmas include issues as diverse as conservation of natural resources, political involvement, use of public transportation, negotiation, international conflict, sacrifice in close relationships, and helping behavior. Due to the pervasiveness of social dilemmas, intense study of these phenomena in both the lab and field has occupied an obvious niche in the social sciences.

One type of social dilemma that has received a great deal of attention is the public goods dilemma (e.g. deciding to contribute to NPR). According to Komorita and Parks (1996), public goods have two defining attributes. First, the public good has a *jointness of supply*, meaning the good can never be depleted. Second, the public good has an *impossibility of exclusion*, which indicates that all members of society are allowed access to the public good, regardless of donation. A public goods dilemma also retains Dawes' (1980) criteria for social dilemmas. It is in the individual's best interest to contribute nothing and enjoy the public good at no cost. This phenomenon has been referred to as 'free-riding'. However, it is in society's best interest for at least enough people to contribute to the public good so it remains in existence. If all persons decide not to contribute, then no member of society has access to the public good. Researchers also identify several other types of social dilemmas. Examples include, take-some games (a situation when each individual has several behavioral options to consume an amount of common resource, but everyone is rewarded when individuals choose to consume less) and public goods dilemmas, often referred to as give-some games (a situation when individuals have multiple behavioral options to contribute to a common resource, and all individuals benefit most when each individual contributes). Social psychologists concerned with understanding cooperation in social dilemmas, such as in take-some games, give-some games, and public goods dilemmas, have focused on the role of person and situation factors. In this discussion, I focus specifically on the role of SVO and self-efficacy.

Social Value Orientation

Messick and McClintock (1968) proposed that a person's choices in interdependent relationships are guided by (1) his/her "social motivation" (currently referred to as social value orientation, or SVO) , (2) reactions to the actions of the interdependent partner, and (3) strategic attempts to influence the partner's actions. The primary focus of their article was on social motivation (SVO), defined in terms of the individual's concern (positive, neutral, negative) with his/her own outcomes in combination with his/her concern for the outcomes of the partner. Messick and McClintock argue that to measure SVO it is desirable to reduce (ideally, eliminate) the influence of reactive and strategic forces, so that choice behavior more directly reflects the individual's underlying motivation. To this end, they developed a method for the assessment of SVO , two features of which guide most research in this area to the present day. First, in this procedure, participants make a series of choices in "decomposed games" ,described in detail later in this dissertation. For now it is sufficient to say that decomposed games are simple models of social interdependence that (according to Messick and McClintock) emphasize the impact of one's choices on his/her own outcomes, and also the outcomes of the partner. Second, the participant makes his/her decomposed game choices in the absence of any information concerning the behavior of his/her partner, and with an understanding that the partner has no information regarding the participant's choices. This second, "no feedback" aspect of the procedure eliminates reactive and strategic influences. Using this procedure, Messick and McClintock demonstrate that three social motives appear to guide interdependent decision making: (1) Cooperation, or the motivation to maximize outcomes to both the participant and the partner, (2) Individualism, the motivation to maximize one's own outcomes with no concern for the partner's and (3) Competition, the motivation to maximize the algebraic difference between one's outcomes and those of the partner. In the discussion section of their paper, Messick and McClintock

suggest that people may differ in terms of the likelihood of being in Cooperative, Individualistic and Competitive motivational states, and provide some statistical evidence in support of the suggestion. For almost four decades now, the growing literature on stable individual differences in SVO demonstrates the prescience of their suggestion.

Griesinger and Livingston (1973), using a geometrical model, extended Messick and McClintock's (1968) original model, and identified 6 motives by considering individuals preferences of self and others outcomes in situations of social interdependence. Later, McClintock (1978) elaborated the geometric model to include 8 motives. As shown in Figure 2, the model includes two orthogonal dimensions (x axis = concern with self, y axis = concern for others) which are capable of mapping Messick and McClintock's (1968) four motives, while also identifying four other social motives; aggression, sadomasochism, masochism, and martyrdom. Research, however, demonstrates that persons rarely ever make choices in social dilemmas that seem to represent each of the four alternative motives (Maki, Thorngate, & McClintock, 1979). Messick and McClintock (1968) developed a classification technique to assess their four primary motives.

Messick and McClintock's (1968) approach includes having participants demonstrate preferences amongst several choices of allocations of points to both self and others. In their decomposed games, individuals are told that they will make a series of choices between allocating points to self and points to another person who is unknown. They are instructed that their total outcome will be dependent both on their own choice and the choices of the other person. However, at no point are they given feedback about the other person's choices. This is to avoid confounding motives with strategies to influence the other. Each item is constructed to include options that distinguish at least one specific motive. For example, in a recently used 'triple dominance measure' used to classify cooperators, individualists, and competitors, participants indicate a preference between three different point allocations, with

each tapping a specific motive, e.g. cooperator (self = 480, other = 480), individualist (self = 540, other = 280), and competitor (self = 480, other 80) (Van Lange, Otten, De Bruin, & Joireman, 1997). If participants choose six or more items tapping the same motive, then they are classified with the corresponding motive. This measure classifies three motives, however, since laboratory studies often include fewer individualists and competitors, relative to cooperators, researchers aggregate the former classifications into a single group.

Often researchers collapse all of the above mentioned classifications into two distinct groups (Van Lange & Kuhlman, 1994). Proselfs include individualists and competitors, while prosocials are altruists, cooperators, and a recent addition, equality maximizers (concerned with equal gains between self and other) (Van Lange, 1999).

In general, SVO is useful in predicting behavior and cognitions in social dilemmas. Research on SVO finds that prosocials demonstrate more cooperative behavior, relative to proselfs, in many different types of social dilemmas; including resource dilemmas (Kramer, McClintock, & Messick, 1986; Liebrand & Van Run, 1985; Parks, 1994; Roch & Samuelson, 1997), public goods dilemmas (Stouten, De Cremer, & Van Dijk, 2005), take-some games (Liebrand, 1984; Sattler & Kerr, 1991; Van Lange & Kuhlman, 1994), give-some games (De Cremer & Van Dijk, 2002; De Cremer & Van Lange, 2001; Van Lange & Kuhlman, 1994; Van Lagne & Semin-Goossens, 1998), and a variety of other experimental games, such as the prisoner's dilemma (De Dreu & McCusker, 1997; Kuhlman & Marshello, 1975; Liebrand, Wilke, Vogel, & Wolters, 1986; McClintock & Liebrand, 1988; McClintock, Messick, Kuhlman, & Campos, 1973). SVO also predicts cognitions in social dilemmas. For example, relative to prosocials, proselfs expect more competition from other players in the prisoners dilemma (Kelley & Stahelski, 1970; Kuhlman & Wimberley, 1976), report less social responsibility (De Cremer & Van Lange, 2001), evaluate behaviors in social dilemmas in terms of potency (Liebrand, Jansen, Rijken, & Suhre, 1986), view cooperation less in

moral terms (Beggan, Messick, & Allison, 1988), and recall more competitive heuristics when in a negotiation context (De Dreu & Boles, 1998). In addition, consistent with the goal prescribes rationality principle, prosocials construe options in terms of a collective rationality (what is best for everyone), and proselfs think of behavioral options in terms of an individualist rationality (what is best for self) (Joireman, Kuhlman, Van Lange, Doi, & Shelley, 2003; Van Lange & Kuhlman, 1994; Van Lange & Liebrand, 1991; Van Lange, Liebrand, & Kuhlman, 1990).

Additional work has demonstrated the ecological validity of SVO. For example, relative to proselfs, prosocials are willing to donate more time to experimental studies (McClintock & Allison, 1989), give more sacrifice in close relationships (Van Lange, Agnew, Harnick, & Steemers, 1997), report more proenvironmental activism (Pahl, Harris, Todd, & Rutter, 2005), demonstrate a stronger preference for public transportation (Van Vugt, Meertens, & Van Lange, 1995), and are less competitive in negotiation processes (De Dreu & Boles, 1998; De Dreu & Van Lange, 1995; Nauta, De Dreu, & Van Der Vaart, 2002; Olekalns & Smith, 2003). Moreover, college roommates are capable of predicting roommates' SVO (Bem & Lord, 1979).

As outlined below, it is predicted that SVO will be moderated by an aspect of the decision context. It is important to understand the types of situations when SVO is an important predictor of cooperation in social dilemmas. Recent research suggests that SVO is more predictive when the framing of the decision is in terms of costs than benefits (De Dreu & McCuster, 1997). The current research considers how the temporal framing of the dilemmas moderates the effect of both SVO and self-efficacy on cooperation in a public goods dilemma.

Self-Efficacy

Another variable that receives attention in dilemmas research is self-efficacy. How people think about their behavior in social dilemmas and its impact on collective outcomes is recognized as an important aspect to consider in predicting behavior in social dilemmas (De Cremer & van Vugt, 1998; Kerr, 1989, 1992; Kerr & Kaufman-Gilliland, 1994). Self-efficacy is defined as an individual's perception of personal control of behavioral outcomes (Bandura, 1986). In the context of social dilemmas, self-efficacy includes an individual's perception about how important their behavior is in determining collective outcomes (e.g. how likely it is that an individual's contribution will actually make a difference in providing a public good). Research demonstrates that as group size increases, perceived self-efficacy in a public goods dilemma declines (Kerr, 1989). Kerr interprets this as the result of a heuristic of low self-efficacy in large groups, which individuals develop over repeated interactions in groups. Most importantly, research should be concerned with how levels of self-efficacy impact cooperation.

Kerr (1989) finds mixed support for the prediction that low self-efficacy predicts actual contributions in a public goods dilemma. His first several studies resulted in non-significant effects, but the direction of effect was consistent with the notion that higher levels of perceived self-efficacy increase with cooperation. In study 4, Kerr observed a significant correlation between self-efficacy and decisions to contribute to a public good. Subsequent research also demonstrates that self-efficacy is useful in predicting cooperation (De Cremer & van Vugt, 1998; Kerr, 1992; Kerr & Kaufman-Gilliland, 1994). To illustrate, De Cremer and van Vugt (1998) found that self-efficacy was positively related to cooperation in a step-level public goods dilemma. Moreover, self-efficacy mediated the relationship between collective identity and cooperation. Therefore, the above mentioned research supports the

notion that self-efficacy is an important factor to consider in predicting cooperation in public goods dilemmas.

Construal Level Theory

The focus on self-efficacy and SVO in the current study is informed by Construal Level Theory (CLT) and its implications regarding the effect of time on decision-making processes. Indeed, time is an important factor to consider in dynamic ongoing social interactions (Kelley, 1997; Parks & Posey, 2005; Rumble, 2005). Kelley (1997) makes clear the utility in modeling a temporal sequence of interdependent interactions and the implications regarding different choices individuals have at any point in the temporal sequence. Transition lists are a method of modeling time in experimental games. This procedure outlines a series of interdependent situations, with each choice affecting the structure of subsequent interactions (Kelley, 1997). By modeling a temporal sequence in experimental games, we can begin to research decision-making processes that are not completely restricted to outcome allocation decisions. Research can begin to consider alternate choice points in social dilemmas, these being points in an ongoing interaction when individuals consider the future of the relationship (Kelley, 1997). Joireman (2005) highlights temporal dilemmas that individuals face in social dilemmas. Temporal dilemmas can take the form of a social fence (an immediate negative consequence for self results in a positive long-term consequence for the collective) or a social trap (forgoing an immediate positive benefit for self results in a larger positive consequence for the collective). Both researchers above consider time as an important factor structuring the decision context and influencing decision-making in social dilemmas. The current research draws on a theory of time and decision-making to outline two novel predictions regarding the effect of time on decisions to contribute in a public goods dilemma.

Recent theory and research suggests that decision-making is affected by the temporal distance of a future event (Lieberman & Trope, 1998). According to Construal Level Theory (CLT), higher-level construal predominates in distant future decisions, whereas lower-level construal takes priority in near future decisions. High-level construal includes perception of central, abstract, and desirable features of information of the decision, and is often more decontextualized, simple, structured, superordinate, and goal relevant (Trope & Liberman, 2003). Lower-level construal is distinct by focusing on peripheral, concrete, and feasibility features of decision information, and is often more complex, unstructured, contextualized, subordinate, and goal irrelevant (Trope & Liberman, 2003). Since SVO is an abstract dispositional preference for self and other outcomes and informs desirable behavior in social dilemmas, this variable is most relevant in higher-level construal. Conversely, self-efficacy is by definition a feasibility concern, and therefore most relevant in low-level construal. A program of research supports CLT and its relevant predictions that temporal distance of events impacts both the level of construal information and a differential emphasis on desirability/feasibility concern in both real life and hypothetical decision-making tasks.

Temporal Distance and Level of Construal

According to Vallacher and Wegner (1987), actions can be construed at varying levels of abstractness. For example, if a student raises their arm in class, this behavior can be interpreted in an abstract goal-relevant manner focusing on why the behavior occurs, such as trying to get the instructor's attention, or a lower-level, concrete, goal-irrelevant manner that emphasizes how the behavior is performed, e.g. lifting a hand above their head. Lieberman and Trope (1998) extended this notion to research on CLT and predicted that distant future perspective results in a higher-level abstract construal of actions. In the first test of CLT, Liberman and Trope manipulated temporal perspective and had participants think of engaging in certain actions (i.e. locking a door, reading a book, and voting). When thinking

of engaging in the actions a year from now, people were more likely to interpret actions in terms of abstract, superordinate, goal relevant descriptions of actions (e.g. securing the house, gaining knowledge, and influencing an election). By contrast, when instructed to think of engaging in the same actions the next day, individuals interpreted actions in a concrete fashion (e.g. turning a key, turning pages, marking a ballot).

In another study, Liberman, Sagristano, and Trope (2002) tested if a distant future perspective results in more abstract construal of information. The authors manipulated temporal distance of a hypothetical camping trip and asked participants to categorize a group of 38 items to be organized for the trip. As hypothesized, participants in the distant future condition grouped the items in fewer categories, compared to the near future condition. These results support CLT, in that information and preferences in distant future perspective are represented according to fewer abstract dimensions, compared to a near future decision perspective.

Temporal Perspective and Emphasizing Desirability/Feasibility Aspects of Behaviors

CLT also makes relevant predictions about temporal effects on decision-making. Liberman and Trope (1998) suggest that desirability information carries more weight than feasibility information in distant future decisions, whereas feasibility carries more weight than desirability in near future decisions. Desirability is defined as information on the value of an end state. Feasibility is information on the probability of attaining a goal. In study one, the authors manipulated feasibility and desirability information in three different hypothetical scenarios. For example, in one scenario the participants imagine that a friend offers to sell them concert tickets. In the scenario the temporal perspective is manipulated: tomorrow vs. a year from now. Desirability is manipulated by how much the participant likes the band and feasibility is manipulated by expense of the tickets. In the distant future decision condition, the impact of desirability information on decisions increased relative to the same scenarios in

the near future decision condition. Therefore, in the concert example, participants reported greater intentions to buy the tickets in the distant future when desirability was high, regardless of the ticket price. So in the distant future condition, desirability overrode the influence of ticket price. However, in the near future condition, participants assigned more weight to feasibility, and intentions to buy the tickets were reduced when feasibility was low (high ticket price).

In another study, Liberman and Trope (1998) tested the ecological validity of the desirability/feasibility prediction in a real life decision-making task. In this study participants were asked to state a preference between two different assignments. The assignments were manipulated according to desirability (interesting or not interesting) and feasibility (assignment in primary language or assignment in second language). Temporal perspective was also manipulated. Participants in the distant future condition (complete the assignment 9 weeks from now) reported stronger preference for the interesting assignment, regardless of feasibility, while participants in the near future condition (1 week from now) showed preference for the easy and uninteresting assignment. Research on gambling preferences also supports the desirability/feasibility CLT prediction, with amount or value of gamble determining gamble preferences more in the distant future condition, while probability of attaining value was more influential in the near future condition (Sagristano, Trope, & Liberman, 2002). The above results support the idea that desirability information is weighted more when the event occurs in the distant future, relative to near future, and that feasibility information is weighted more in the near future, compared to the distant future.

Implications

The research just reviewed carries important implications for how the temporal framing of the social dilemma may impact the role of SVO and self-efficacy in social dilemmas. When making decisions in social dilemmas, individuals may perceive behavioral

alternatives in terms of higher level-construal (e.g. the purpose/goal of the actions), if those actions and consequences do not result until some specified distant future time. If actions in social dilemmas are construed more abstractly, then such a construal should facilitate the use of abstract dispositional social values, since such values are relevant in informing desirable ways of behaving. Following the assumptions that 1) social values inform what is desirable and 2) that social values are more abstract than feasibility considerations in social dilemmas, it is predicted that SVO will be a stronger predictor of behavioral choice when thinking of a distant future social dilemma, relative to a near future dilemma.

Conversely, if making this same social decision in a near future perspective, feasibility will be more salient. It is proposed that self-efficacy in social dilemmas can be viewed as a feasibility concern. Indeed, self-efficacy is considered the subjective perception of the probability that an individual's behavior will actually make a difference in a social dilemma. Based on CLT, this leads to the prediction that self-efficacy has more impact on forming behavioral intentions when the social dilemma occurs in the near future, relative to the distant future.

Hypotheses

H1: Social value orientation will predict contributions in a step-level public goods dilemma, such that individuals with a prosocial orientation will contribute more, relative to proself orientations.

H2a: Large group size will reduce contributions in a step-level public goods dilemma, relative to a small group size.

H2b: Large group size will reduce self-efficacy, relative to small group size.

H2c: Self-efficacy will be positively related to contributions in a public goods dilemma.

H2d: Self-efficacy will mediate the relation between group size and contributions, but only in the near future condition.

H3: Temporal perspective will moderate the SVO-behavior relation in a public goods dilemma, such that SVO will have a stronger effect in the distant future condition.

H4: Temporal perspective will moderate the relationship between self-efficacy and cooperation, such that self-efficacy will have larger effect in the near future condition.

RESEARCH DESIGN AND METHODOLOGY

Participants and Procedure

One hundred and forty-one participants were recruited from introduction to psychology classes at Washington State University. All participants agreed to an informed consent prior to experiment participation. All experimental materials were completed over the internet. Each participant fist completed a measure of SVO adapted from the ring measure (Liebrand & McClintock, 1988) and the Schwartz value scale (Schwartz, 1994). Next, participants made a choice regarding how much to contribute in a public goods dilemma.

Individual Difference Measures

Half ring measure of SVO. Liebrand and McClintock (1988) developed a method, known as the ring measure, to classify cooperators, individualists, and competitors. The current research employs a modification of this technique called the half ring measure used in prior research (Joireman, 1996; Teta, 1994). The half ring measure is a social decision-making task, in which participants respond to several dichotomous choices (see Appendix A). Each choice allocates points to self and points to other. Basically, the amount of points allocated to the self and other over several choices is used to index SVO. More specifically, allocated points to self and other are used to calculate the slope of each individual's value vector extending from the origin of the self and other outcomes dimensions. The half ring measure is able to predict choices in other interdependent games (Joireman, 1996). This measure of SVO is used in the current study, due to its ability to assess SVO on a continuous scale, and thereby generates greater statistical power.

Schwartz Value Scale (SVS). To complement the ring measure and generalize the results on values, participants also completed the SVS (see Appendix B). Schwartz (1994) developed a 56-item scale tapping relative importance of 10 different values. Participants

rate the importance of 56 values, on a scale from -1 to 7 (-1 = opposed to my values, 0 = not important, 3 = important, 6 = very important, and 7 = supremely important). All values collapse under ten latent values, which according to Schwartz, form nine distinct motivational orientations. Self-transcendence values, as measure by this scale, reliably relate to prosocial values, measured by decomposed games (Garling, 1999; Joireman & Duell, 2005). Benevolence values, as measured by SVS, are also able to predict cooperation in social dilemmas (Garling, 1999). This measure is included primarily for exploratory purposes, to further test the predictive ability of other social values in a distant future perspective.

Public Goods Dilemma

First, the public goods dilemma was explained. The paradigm used was a variation on a step-level public goods dilemma applied in prior research (De Cremer & van Vugt, 1998). Participants were informed that they would be making decisions in a group regarding how much individual resource (i.e. money) to contribute to a public good. Participants were told that they would be given an endowment of money (3 dollars) and would be asked to decide on a specific amount to contribute to the group, which was non-refundable (see Appendix C). Participants were told that if the amount of contributions from all group members reached a specific amount, this would result in a bonus to each group member. The bonus includes a distribution of five dollars to each group member. All participants were told that they would have a chance to win money, and that one group would be randomly selected to attain their final amount of money. This amount will include both their individual endowment after contribution plus the bonus, if achieved by the group successfully. Therefore, each participant was told that they have an opportunity to achieve between 0 and 8 dollars. Participants in all conditions were told they had a 1 in 5 chance of being selected to win money.

Each participant was given 300 pennies as an endowment. Participants were randomly assigned to one of two different group sizes, 10 or 100. In the ten-person group participants were told that the group must achieve a total of 2,000 pennies. In the 100-person group, participants were told that the group must attain 20,000 pennies to acquire the bonus. Therefore, each participant, regardless of group size, must on average allocate 200 pennies.

After reading the instructions for the public goods dilemma, participants were asked a few questions to quiz their understanding of the dilemma (see Appendix D). For example, all participants were asked if the public good would be achieved if everyone contributed 100 pennies. Also, they were asked their total monetary outcome awarded if they decided not to give any pennies, but still the public good was provided. Conversely, participants were also asked what their outcome would be if they decided to give all pennies to the public good, and then the group attained the public good. If participants incorrectly answered any of the questions, the computer redirected the participant back to the question after completion of the questionnaire, and also explained the correct answer.

Before reading the public goods dilemma explanation, participants were randomly assigned to adopt one of two perspectives when making decisions. Participants were asked to imagine making the decision as if the dilemma were about to result tomorrow or a year from now. The temporal perspective instructions are included below.

Distant future perspective. When making your contribution decision, imagine making your choice a year from now. If asked to make this decision a year from now- how much would you choose to contribute? Think about making your contribution choice and actually paying money and attaining the outcome a year from now. Please choose an amount to contribute based on what you would do a year from now.

Near future perspective. When making your contribution decision, imagine making your choice tomorrow. If asked to make this decision tomorrow- how much would you

choose to contribute? Think about making the choice and actually paying the money and attaining the outcome tomorrow. Please choose an amount to contribute based on what you would do tomorrow. Therefore, the public goods dilemma involves two manipulations: (1) the temporal perspective and (2) group size (smaller or larger).

Participants were asked to indicate how much they would contribute to the public good (the group fund). Afterwards, participants completed a response questionnaire that included a measure of perceived self-efficacy (see Appendix E). Specifically, participants were asked to indicate on a scale from 0 to 100 how likely it was that their decision actually made a difference on whether or not the public good was attained. The post-experiment questionnaire also included a manipulation check for temporal perspective. This involved having the participant rank-order 4 different descriptions of their actions according to how they perceive the statements best describing their actions. Two of the descriptions are abstract (e.g. influencing the attainment of bonus and deciding how much to contribute to a bonus) and the other two are concrete descriptions of actions (e.g. pressing keys and reading text). Lastly, participants were debriefed regarding the purpose of the experiment.

ANALYSES

Data Screening and Preparations

All continuous variables were tested for normality by assessing skewness and kurtosis. No variables violated the assumption of normality. The continuous variable in this study had the following descriptive statistics; donations (M = 225.9, SD = 73.9), SVO (M = 2.5, SD = 61.5), individual self-efficacy (M = 69.1, SD = 27.5), and collective self-efficacy (M = 60, SD = 24.7).

The manipulations of temporal perspective and group size were contrast coded for all regression analyses. For temporal perspective, near future condition (tomorrow) was coded -1 and the distant future condition (a year from now) was coded 1. For group size, the 10-person group condition was coded -1 and the 100-person condition was coded 1.

All continuous variables used as predictors in regression analyses were centered by subtracting the mean vale from each raw score. These mean centered variables were used in all analyses. This strategy effectively reduces multicollinearity problems by reducing the correlation between each of the main effects with the interaction variable in the regression equation (Aiken & West, 1991). Also, mean centered variables make the lower-order effects in the regression equation interpretable in the context of a significant interaction.

SVO is analyzed using a continuous variable. The continuous variable is simply the aggregate of points allocated to other during each of the 24 interdependent choices in the half ring measure. This variable ranges from -112 to 111. We added a constant of 113 to each raw score, in order to eliminate negative scores and to ease interpretation of the effects with this continuous variable.

The Schwartz Value Scale includes 56 items tapping 10 latent values. The inter-item reliability varies across each of the values, self direction, alpha = .62, hedonism, alpha = .67,

achievement, .79, power, alpha = .84, security, alpha = .66, conformity, alpha = .66, tradition, alpha = .68, stimulation, alpha = .54, benevolence, alpha = .78, and universalism, alpha = .81. We aggregated the responses across items tapping specific values and use these aggregate scores as predictor variables. We also computed the mean average response for each participant and use this variable as a covariate during analyses with these variables.

Manipulation Check

After deciding on the public good donation, participants rank ordered 4 possible descriptions of their behavior. This was a manipulation check for the temporal construal manipulation. According to temporal construal level theory, participants construe distant future behavior more abstractly than the same near future behaviors. This would result in a preference for abstract descriptions other their behavior, such as 'influencing the attainment of bonus,' compared to a more concrete description of the behavior, e.g. 'pressing keys'. Thus a test was conducted to assess any systematic difference in the rank ordering of the responses, according to the temporal perspective manipulation.

The ranking of each statement may be analyzed by testing the mean group differences in the ranking of each item. This approach was taken since the questionnaire has never been used before and a specific rank ordering was not predicted. However, of the four descriptions two items were created as more abstract description and two items were more concrete descriptions. The near future condition should have lower scores for the concrete descriptions, meaning these descriptions would be most preferred by this condition, and the distant future condition should have lower raking scores for the abstract descriptions. The near future condition (M = 2.65, SD = 1.12) actually had a marginally significant average higher ranking than the distant future condition (M = 2.32, SD = 1.04) for the abstract description, 'influence the attainment of the bonus', $t(133) = -1.78$, $p = .078$. This was

opposite of what was expected. The time perspective manipulation did not have a statistically significant effect on either of the remaining items that were ranked.

Group size was also manipulated in the public goods dilemma. Past research shows that group size affects perceived self-efficacy in social dilemmas. Individual and collective self-efficacy were both measured after making a decision in the public goods dilemma. An analysis of self-efficacy and group size may indicate if the manipulation of group size was effective. In fact, the 10 person condition (M = 69.98, SD = 27.90) did not report significantly more individual self-efficacy than the 100-person condition (M = 67.79, SD = 27.05), $t(133) = .448$, $p = .655$. Likewise, the 10-person condition (M = 63.31, SD = 24.25) did not report significantly more collective self-efficacy than the 100-person condition (M = 59.44, SD = 25.71), $t(133) = .198$, $p = .843$. These results do not support the group size manipulation. Although participants did correctly indicate that number of persons in their group during the pre-game quiz, these results suggest that the manipulation was not effective enough to cause a psychological effect observed in prior research.

Social Values, Self-Efficacy, Temporal Perspective, and Donation Amount

We tested most hypotheses in a single model using multiple regression. The following predictions were tested by entering social value orientation, perceived individual self-efficacy, temporal perspective, and the hypothesized interactions in a single regression model predicting the amount of donation. In this model, we test the prediction that social value orientation would positively relate to the amount donated to the group fund (H1), and that this effect would be stronger in the distant future decision, than the near future decision (H3). We also predict a positive relationship between perceived individual self-efficacy and the amount of donation (H2c) and that this effect would be stronger in the near future decision dilemma compared to the distant future dilemma (H4).

The results of the regression model are shown in Table 1. The overall model failed to explain a significant amount of variance donation to the public good. The main effects of SVO, group size, and time perspective were non-significant. These results fail to support the main effect hypotheses of SVO (H1) and group size (H2a) on donations. The model included the interactions between time perspective and both SVO and group size. The interaction beta weights were also statistically non-significant. These data do not lend support to the focal interaction hypotheses. Time perspective did not interact with either SVO (H3) or group size (H4) to predict donations. Though no a priori prediction was made about the 3-way interaction, this interaction was added in the third step of the same model and found to be non-significant.

A second analysis of the main hypotheses was conducted, including both individual self efficacy and collective self efficacy in the model. Results are displayed in Table 2. Step one tested the main effects of SVO, individual self-efficacy, collective self-efficacy, group size, and temporal perspective. All main effects were non-significant and the model did not explain a significant amount of variance in donations. These data do not support the hypotheses that SVO (H1), group size (H2a), and self-efficacy (H2c) predict donations. The second step includes the two way interactions between time perspective and each other variable in the model predicting amount of donation. Adding the interactions did not contribute a significant amount of variance explained in the regression model, R^2 *change* = .011, $F(4, 125) = .4341$, $p = .853$. Also, the individual beta weights of each interaction failed to reach standard levels of significance. These data do not support the hypothesis that efficacy would more strongly predict donation decisions in the near future perspective, compared to the distant future perspective.

One hypothesis requires a mediation analysis. Group size was hypothesized to predict the amount of donation, such that a larger group size condition (100 people) would donate less than the smaller group size condition (10 people) (H2a). We also predicted that group size would impact self-efficacy, with the larger group size reducing individual self-efficacy (H2b). Perceived individual self-efficacy, as stated before, was also predicted to positively relate to donation amount (H2c). Thus, the mediation hypothesis predicted the effect of group size on donation amount is mediated by perceived individual or collective self-efficacy (H2d). . The mediation model will not be tested, since the effect between group size and donations is very small, less than one percent. In addition, there was no effect for self-efficacy and public goods donations.

The Schwartz Value Scale, Temporal Perspective, and Donation Amount

The Schwartz Value Scale (SVS) was administered to provide a further test of the hypothesis that values are more strongly related to decisions about event in the distant future, than the near future. Other than this general hypothesis, the following analyses were conducted primarily for exploratory purposes.

First, a multiple hierarchical regression model included the average mean response in step one as a covariate, following the recommendations of Schwartz (1994), and each of the ten values in step two. No a priori predictions were made regarding what values would relate to donation amount. The covariate in the first step was non-significant. Adding the 10 variables to the model failed to make a statistically significant contribution to the models predictive capacity, R^2 *change* = .034, $F(11, 122) = .386$, $p = .959$. No individual betas were significant and therefore these are not interpreted.

Of primary interest however, was the potential interaction between the values and time perspective on the amount of donation. Only a few select interactions between specific

values and time perspective were chosen for study. The present analysis will focus on benevolence, universalism, and power values. Benevolence and universalism values have predicted cooperation and social value orientation in past research (Garling, 1999; Joireman & Duell, 2005). In the current research however, benevolence and universalism values only have a weak non-significant relationship with SVO, $r = .067$, $p = .466$, and $r = .037$, $p = .666$, respectively. The following test of the interaction included entering the mean centered values with time perspective into step one and their respective interactions with time perspective in step two, predicting the amount of donation. Any significant interactions may lend support to H3, that values are more predictive in the distant future condition, than the near future condition. The results are displayed in table 3. Universalism, benevolence, power, and time perspective did not significantly predict amount of donations in step one and adding the interaction terms did not add a significant amount of variance explained in the model, R^2 *change* = .034, $F(3, 127) = 1.534$, $p = .209$. These data do not support the hypothesis that values are more predictive of donations made in the distant future condition, than the near future condition.

Post Hoc Analyses

A few post hoc analyses were conducted that were interesting, but not considered the focus of the current research. In one analysis, SVO, individual self-efficacy, and their interaction were used to predict the amount of donation to the public good. In this post hoc analysis, SVO and individual self-efficacy did not predict donations. However, adding the interaction to the model increased a significant amount of variance explained in donations, R^2 *change* = .033, $\beta = -5.83$, $t(133) = -2.117$, $p = .036$. These results are displayed in Table 4. Follow up tests were conducted to consider the nature of this interaction. Simple slope analyses were used to test the relationship between self-efficacy and donation amount at one

standard deviation above and below the mean for SVO. Figure 3 displays these simple slopes and the interaction. As seen in the graph, there is a strong positive relationship between self-efficacy and donations at one standard deviation below the mean for scores on the half ring measure, $\beta = .256$, $t(131) = 2.21$, $p = .029$. This relationship indicates that at low levels of SVO (more proself), as self-efficacy increases, so do increases in donations to a public good. However, considering high levels of SVO (more prosocial), the relationship between self-efficacy and donation is reversed and slightly negative, $\beta = -.093$, $t(131) = .76$, $p = .249$, but this effect was not statistically significant. So we cannot make any strong conclusions regarding the effect of self-efficacy on donations at these levels of SVO.

This interaction between SVO and self-efficacy can also be considered by looking at the relation between SVO and donations at both high and low levels of self-efficacy. A follow up test examining the simple slopes of this interaction from this perspective found a positive relation between SVO and donations at low levels of self-efficacy, $\beta = .231$, $t(131) = 2.006$, $p = .047$. There was actually a non-statistically significant negative relationship between SVO and donations at high levels of self-efficacy, $\beta = -.119$, $t(131) = -.916$, $p = .336$. The interaction between SVO and self-efficacy did not occur for collective self-efficacy.

Another post hoc examination of the data the interaction between group size and SVO on the amount of donation to a public good was tested. This interaction did not explain a significant amount of variance in the amount of donation, $\beta = .058$, $t(131) = .609$, $p = .543$.

Lastly, for exploratory purposes, SVO, group size, temporal perspective, and their interactions were entered into a model predicting self-efficacy and collective-efficacy. The only a priori prediction in this model is the main effect between group size and self-efficacy.

The results are displayed in table 5. There were no significant relationships in each model predicting individual self-efficacy and collective self-efficacy.

DISCUSSION

A single study tested two focal hypotheses about the effect of temporal perspective, near or distant future, on decision making in a public goods dilemma. Specifically, a distant future perspective of the public goods dilemma was predicted to make social values more important in the social decision, while a near future perspective would promote self-efficacy in deciding to contribute to a public good. In the current study, I measured social values, manipulated both time perspective, tomorrow or a year from now, and group size, 10 or 100 people, in a public goods dilemma, had participants rate perceived self-efficacy and collective-efficacy, and measured the amount they were willing to donate from an endowment to a public good.

Since values are abstract cognitive beliefs that indicate desirable ways of acting (Schwartz, 1994), and deciding how to act in distant future situations focuses on desirability of behavioral alternatives (Liberman & Trope, 1998), it was predicted that social values would more strongly relate to donation decisions in a public goods dilemma, if the dilemma is perceived in a distant future perspective, compared to a near future perspective. In fact, time perspective and social value orientation did not interact to predict the amount of donation. Benevolence, universalism, and power values, as measured by the Schwartz Value Scale, also did not interact with time perspective to predict the amount of donation.

Also, it was hypothesized that an immediate temporal perspective, such as thinking about acting in a dilemma tomorrow, would make feasibility features of the decision more important in making the decision (Liberman & Trope, 1998). Since, perceived self-efficacy is directly affected by group size in social dilemmas (Kerr, 1989), and these are both arguably feasibility features of a decision in a public goods dilemma, it was predicted that the temporal perspective manipulation would interact with both group size and perceived self-efficacy to affect size of donation. This was not the case and all interactions testing these

hypotheses failed to reach statistical significance. Therefore, these data do not lend support to either of the focal interaction hypotheses.

Analysis of the predicted main effect of social value orientation and group size on the amount of contribution to the public goods was also no supported. Both main effects failed reach standard conventional levels of statistical significance.

Values were also measured by using the Schwartz Value Scale. In a single model all of the Schwartz values were entered predicting the amount of donations. This model was not significant and no single value related significantly to the amount of donation. A select group of values (power, universalism, and benevolence) were chosen to interact with time perspective to predict the amount of donation. The model did not predict a statistically significant amount of variance in donations.

Several exploratory analyses were also conducted. Interestingly, an interaction between SVO and self-efficacy predicting donation was found. Although this was not an a priori hypothesis and future research must replicate this effect, it is quite interesting, and may have several plausible explanations. At lower levels of self-efficacy, there was a significant positive relationship between SVO and donations. However, at high levels of self-efficacy there was a weak non-significant negative relationship between SVO and donations. This interaction suggests that social values are more predictive of cooperation in situations where self-efficacy is low. Alternatively, the interaction can be interpreted as different relationships between self-efficacy and donations according to level of SVO. Considering this perspective, at low levels of SVO there was a significant positive relation between self-efficacy and donations. However, at high levels of SVO there was a non-significant negative relation between self-efficacy and donations. This perspective suggests that self-efficacy matters most for proself individuals. In prosocials, self-efficacy doesn't do much to predict donations.

There are several potential explanations for the observed effect. The results suggest that individuals with different trait level values respond differently to situations of low and high self-efficacy. Perhaps, when self-efficacy is high, individuals with a proself orientation may decide to help out of self-interest, since receiving the public good may be worth more than the contribution. Prior theorists have proposed that selfish individuals will cooperate with selfish motives when either the delayed or collective outcomes are worth more to the individuals than responses that focus on smaller immediate self gain (Kuhlman & Marshello, 1975). In the case of high self-efficacy, when a proself feels that their contribution really matters, attaining the bonus of 5 dollars would be considered worth more than receiving the endowment of 3 dollars. It might also be that self-efficacy impacts the framing of the decision for proselfs. For example, while research supports the idea that proselfs view cooperation as a power issue, with cooperation being a weak response to the situation (Liebrand et al., 1986), it may be that high self-efficacy changes how these individuals view cooperation. In this context, they may think of cooperation as a the strong option, as opposed to weak, because this is more likely be best option for self outcome. It might also be that proselfs may think of the options less in terms of power and more as a moral issue, since their contribution is perceived as really being able to make a difference in attaining the public good. This perspective would predict that high self-efficacy in this context may increase a sense of social responsibility, and this would increase prosocial responses in these individuals. Future research may consider the relationship between feelings of social responsibility and levels of self-efficacy in a public goods dilemma.

Yet another explanation focuses on different decision heuristics used by proself and prosocials in social dilemmas. Often social values are thought to affect cooperation in social dilemmas because these values indicate different decision heuristics and rules applied in interdependent situations (Kelley, 1997). It might be that situations of low self-efficacy may

promote the use of immediate focused self-gain ‘get what *I* can’ type heuristics in proselfs, but these heuristics are not used by prosocials. Prosocials instead, may be still thinking of the collective outcomes and using decision heuristics that are focused on joint gain, e.g. ‘what is best for the group’. However, when self-efficacy is high, this may promote the use of different decision heuristics for proselfs, e.g. ‘go for it all’. These different heuristics used by proselfs may not necessarily be due to a change in motives, e.g. shifting to a prosocial orientation, but instead would be due to the use of a more risky (uncertain) decision heuristic merely aligned with what’s best for the collective. Again, these are speculations and require further testing. However, given the nature of the interaction and its several potential explanations, this would make for important future research.

An underlying issue with the current data is low statistical power. For several reasons, I was unable to run as many participants as I had planned. As such, it is likely that statistical power was too low and these data may therefore include several type II errors. The present researcher predicts medium effect sizes and the sample is too low to reach a desired level of power, often estimated at .80, for these effects. For example, to obtain the level of desired power (.80) to detect a medium effect size (d = .5, alpha = .05, k = 4) in the current research, requires a sample of 356 participants (Maxwell & Delaney, 2004). The current study (n = 135) is below this desired sample size. Also, it is likely that some of the effects would be small, such as d = .25. Adequate power to test for these effects would require a substantial number of more participants than the current study, such as 1,400 participants (Maxwell & Delaney, 2004). Therefore, these data must be considered in the context of this low power issue.

There are several additional limitations of the current research. First, the paradigm to study cooperation might be too abstract. Although research has applied this method before (De Cremer & van Vugt, 1998), and there was an attempt to make the decision ‘more real’ by

including a randomized procedure for participants to receive their respective amount of money, there is still a possibility that participants taking the online survey did not really get involved in the decision. Many participants might have lacked the motivation to truly engage themselves in this abstract model of a public goods dilemma. In fact, the study had an extremely high attrition rate. Many individuals started the questionnaire (n = 270), but only a few more than half of these participants actually finished (n = 141).

Finding that SVO did not positively relate to values measured by SVS also raises questions about the validity of the data. Several prior studies have demonstrated a positive relationship between benevolence and universalism values and measures of SVO (Garling, 1999; Joireman & Duell, 2005). There were no statistically significant relationships between these values and SVO, as would be expected, and this too may also be due to lack of participants' involvement in the questionnaire. However, one advantage of the ring measure is that the experimenter is able to calculate the consistency of an individual's responses. The value of consistency can range from 0 to 100 (with 100 most consistent). The average consistency rating is .91 (*SD* = .21), indicating the participants in this study responded with much consistency in this scale. Another concern is that SVO did non have a main effect on donations in the public goods dilemma. Although prior research has found no relationship between different measures of social values and donations to a public good (Parks, 2004), other research has found a positive relationship (Stouten, De Cremer, & Van Dijk, 2005), and theoretically prosocials should be expected to contribute more than proselfs. Interestingly, SVO did interact with self-efficacy to predict donation, and at low levels of self-efficacy there was a significant positive relationship between SVO and donations. Regardless of this post hoc finding, the lack of a main effect between SVO and donations to the public good may indicate that individuals were not really involved in the decision. To help address these

concerns, future research should conduct a similar study in the lab, not online, and with certain monetary consequences.

Another concern is the method used to manipulate temporal perspective of the public goods dilemma. The manipulation check of this variable did not support the conclusion that this manipulation worked. It was predicted that the distant future perspective would rank abstract descriptions as most appropriate descriptions of behavior, and the near future condition would prefer the concrete descriptions of behavior. This was not the case and time perspective did not predict ranking of the descriptions. Also, it might be that manipulating group size in the public goods game didn't really manipulate feasibility concerns, since every person received 300 pennies and is capable of donating the endowment. This would mean that self-efficacy and group size would not intact with time perspective manipulation to predict donations. Future research should consider the relationship between time perspective and other social dilemmas that include taking resources, opposed to giving an endowment, as used in the current research. It should be noted that these descriptions of behavior were not used in prior research and were not pilot tested. The methods employed in the current research to manipulate time perspective, however, were nearly identical to manipulations in past research testing construal level theory (Liberman & Trope, 1998). Perhaps future research can manipulate the actual distance of the dilemma. For example, research using the current design could have participants come back to the lab in either the near or distant future to actually act on their respective choice. This design would also allow for the testing that the intentions to act formed in time one are predictive of the actual behaviors in the future event. It might be predicted that decisions about near future events will more strongly predict actual behaviors in these events, relative to distant future decisions predicting behavior in the actual distant future event.

Despite these limitations, the current research has several strengths. First, this research considered two different values measures to test the interaction between values and time perspective on donation amount. The similar null findings found by each scale provide stronger evidence against this interaction hypothesis. Second, all value variables were continuous, which provides stronger statistical power than categorical variables to detect an effect. Third, the paradigm included a randomized procedure to select twenty percent of participants to receive money for their decisions. This was included to make the decision 'more real' by introducing actual monetary consequences. Fourth, participants were tested on their knowledge of the game. This ensured that participants understood the game. Lastly, the computer protocol would make responses seem more anonymous. This may potentially reduce any social desirability concerns with responding to the scale and making the donation decision.

Future research should apply an alternate manipulation of temporal perspective, use a more 'real life' public goods decision paradigm that involves certain monetary payoffs, and replicate the finding that social value orientation interacts with self-efficacy to predict cooperation in a public goods dilemma.

REFERENCES

Aiken, L.S., & West, S. G. (1991). *Multiple regression: testing and interpreting interactions*. Newbury Park., CA: Sage.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Beggan, J.K., Messick, D.M., & Allison, S.T. (1988). Social values and egocentric bias: Two tests of the might over morality hypothesis. *Journal of Personality and Social Psychology, 55,* 606-611.

Bem, D.J., & Lord, C.G. (1979). Template matching: A proposal for probing the ecological validity of experimental settings in social psychology. *Journal of Personality and Social Psychology, 37,* 833-846..

Dawes, R.M. (1980). Social dilemmas. *Annual Review of Psychology, 46,* 190-203.

De Cremer, D., & Van Dijk, E. (2002). Reactions to group success and failure as a function of identification level: A test of the goal-transformation hypothesis in social dilemmas. *Journal of Experimental Social Psychology, 38,* 435-442.

De Cremer, D., & Van Lange, P.A.M. (2001). Why prosocials exhibit greater cooperation than proselfs: The role of social responsibility and reciprocity. *European Journal of Personality, 15,* 5-18.

De Cremer, D., & van Vugt, M. (1998). Collective identity and cooperation in a public goods dilemma: A matter of trust or self-efficacy? *Current Research in Social Psychology, 3,* 1-9.

De Dreu, C.K.W., & Boles, T.L. (1998). Share and share alike or winner take all?: The influence of social value orientation upon choice and recall of negotiation heuristics. *Organizational Behavior and Human Decision Process, 76,* 253-276.

De Dreu, C.K.W., & McCuster, C. (1997). Gain-loss frames and cooperation in two-person social dilemmas: A transformational analysis. *Journal of Personality and Social Psychology*, *72*, 1093-1106.

De Dreu, C.K.W., & Van Lange, P.A.M. (1995). The impact of social value orientations on negotiator cognition and behavior. *Psychological Bulletin, 21*, 1178-1188.

Garling, T. (1999). Value priorities, social value orientations, and cooperation in social dilemmas. *British Journal of Social Psychology, 38,* 397-408.

Griesinger, D.W., & Livingston, Jr., J.W. (1973). Toward a model of interpersonal motivation in experimental games. *Behavioral Science, 18,* 173-188.

Joireman, J. (1996). *Differing perceptions of the interdependence structure underlying commuting decisions: The role of social value orientation, trust, and travel related concerns.* Unpublished doctoral dissertation, University of Delaware.

Joireman, J. (2005). Environmental problems as social dilemmas: The temporal dimension. In A. Strathman & J. Joireman (Eds.), *Understanding behavior in the context of time: Theory, research, and application* (pp.289-304). Mahwah, NJ: Lawrence Erlbaum Associates.

Joireman, J., & Duell, B. (2005). Mother Teresa versus Ebenezer Scrooge: Mortality salience leads to endorse self-transcendence values (unless proselfs are reassured). *Personality and Social Psychology Bulletin, 31*, 307-320.

Joireman, J.A., Kuhlman, D.M., Van Lange, P.A.M., Doi, T., & Shelley, G.P. (2003). Perceived rationality, morality, and power of social choice as a function of interdependence structure and social value orientation. *European Journal of Social Psychology, 33,* 413-437.

Kelley, H. H. (1997). Expanding the analysis of social orientations by reference to the sequential-temporal structure of situations. *European Journal of Social Psychology, 27*, 373-404.

Kelley, H.H., & Stahelski, A.J. (1970). Social interaction basis of prosocials and competitors beliefs about others. *Journal of Personality and Social Psychology, 16,* 66-91.

Kerr, N.L. (1989). Illusions of efficacy: The effect of group size on perceived efficacy in social dilemma. *Journal of Experimental Social Psychology, 25*, 287-313.

Kerr, N.L. (1992). Efficacy as a causal and moderating variable in social dilemmas. In W. Liebrand, D. Messick, & H. Wilke (Eds.). *Social dilemmas: Theoretical issues and research findings* (pp. 59-80). New York: Pergamon

Kerr, N.L., & Kaufman-Gilliland, C.M. (1994). Communication, commitment, and cooperation in social dilemmas. *Journal of Personality and Social Psychology, 66*, 513-529.

Komorita, S.S., & Parks, C.D. (1996). *Social Dilemmas.* Boulder, CO: Westview Press.

Kramer, R.M., McClintock, C.G., & Messick, D.M.. (1986). Social values and cooperative response to a simulated resource conservation crisis. *Journal of Personality, 54*, 576-592.

Kuhlman, D.M., & Marshello, A.F. (1975). Individual differences in game motivation as moderators of preprogrammed strategy effects in the prisoner's dilemma. *Journal of Personality and Social Psychology, 32*, 922-931.

Kuhlman, D.M., & Wimberley, D. L. (1976). Expectations of choice behavior held by cooperators, competitors, and individualists across four classes of experimental games. *Journal of Personality and Social Psychology, 34*, 69-81.

Liberman, N., Sagristano, M.D., & Trope, Y. (2002). The effect of temporal distance on level of mental construal. *Journal of Experimental Social Psychology*, *38*, 523–534.

Liberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology*, *75*, 5–18.

Liebrand, W.B.G. (1984). The effect of social motives, communication and group size on behavior in an N-person multi-stage mixed-motive game. *European Journal of Social Psychology, 14*, 239-264.

Liebrand, W.B.G., Jansen, R.W.T.L., Rijken, V.M., & Suhre, C.J.M.. (1986). Might over morality: Social values and the perception of other players in experimental games. *Journal of Experimental Social Psychology*, *22*, 203-215.

Liebrand, W.B., & 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.

Liebrand, W.B.G., & van Run, G.J.. (1985). The effects of social motives on behavior in social dilemmas in two cultures. *Journal of Experimental Social Psychology, 21,* 86-102.

Liebrand, W.B., Wilke, H.A.M., Vogel, R., & Wolters, F.J.M. (1986). Value orientation and conformity: A study using three types of social dilemma games. *The Journal of Conflict Resolution, 30,* 77-97.

Maki, J.E., Thorngate, W.B., & McClintock, C.G. (1979). Prediction and perception of social motives. *Journal of Personality and Social Psychology*, *37*, 203-220.

Maxwell, S. E., & Delaney, H. D. (2004). *Designing experiments and analyzing data* (2nd Ed.). Mahwah, NJ: Lawrence Erlbaum.

McClintock, C.G. (1978). Social values: Their definition, measurement, and development. *Journal of Research and Development in Education, 12*, 121-138.

McClintock, C.G., & Allison, S.T. (1989). Social value orientation and helping behavior. *Journal of Applied Social Psychology*, *19*, 353-362.

McClintock, C.G., & Liebrand W.B. (1988). Role of interdependence structure, individual value orientation, and another's strategy in social decision making: A transformational analysis. *Journal of Personality and Social Psychology, 55,* 396-409.

McClintock, C.G., Messick, D.M., Kuhlman, D.M., & Campos, F.T.. (1973). Motivational basis of choice in three-choice decomposed games. *Journal of Experimental Social Psychology, 9,* 572-590.

Messick, D.M., & McClintock, C.G. (1968). Motivational basis for choice in experimental games. *Journal of Experimental Social Psychology, 4,* 1-25.

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.

Olekanlns, M., & Smith, P.L. (2003). Social motives in negotiation: The relationships between dyad composition, negotiation processes and outcomes. *International Journal of Conflict Management, 14,* 233-254.

Pahl, S., Harris, P.R., Todd, H.A., & Rutter, D.R. (2005). Comparative optimism for environmental risks. *Journal of Environmental Psychology, 25,* 1-11.

Parks, C.D. (1994). The predictive ability of social values in resource dilemmas and public goods dilemmas. *Psychological Bulletin, 20,* 431-438.

Parks, C.D., & Posey, D.C. (2005). Temporal factors in social dilemma choice behavior: Integrating interdependence and evolutionary perspectives. In A. Strathman & J. Joireman (Eds.), *Understanding behavior in the context of time: Theory, research, and application* (pp.225-242). Mahwah, NJ: Lawrence Erlbaum Associates.

Roch, S.G., & Samuelson, C.D. (1997). Effects of environmental uncertainty and social value orientation in resource dilemmas. *Organizational Behavior and Human Decision Processes, 70,* 221-235.

Rumble, A.C. (2005). The dimension of time in interdependence theory. In A. Strathman & J. Joireman (Eds.), *Understanding behavior in the context of time: Theory, research, and application* (pp.207-224). Mahwah, NJ: Lawrence Erlbaum Associates.

Sagristano, M., Trope, Y., & Liberman, N. (2002). Time-dependent gambling: Money now, odds later. *Journal of Experimental Psychology: General, 131,* 364–376.

Sattler, D.N., & Kerr, N.L. (1991). Might vs. morality explored: Motivational and cognitive bases for social motive. *Journal of Personality and Social Psychology, 60,* 756-765.

Schwartz, S.H. (1994). Are there universal aspects in the structure and content of human values? *Journal of Social Issues, 50,* 19-45.

Stouten, J., De Cremer, D., & Van Dijk, E. (2005). All is well that ends well, at least for proselfs: Emotional reactions to equality violation as a function of social value orientation. *European Journal of Social Psychology, 35,* 767-783.

Teta, P.D. (1994). *Structural and intrapersonal influences on decision making in 2 x 2 symmetric games*. Doctoral dissertation, University of Delaware.

Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review, 110,* 403–421.

Vallacher, R. R., & Wegner, D. M. (1987). What do people think they're doing? Action identification and human behavior. *Psychological Review,* 94, 3-15.

Van Lange, P.A.M. (1999). The pursuit of joint outcomes and equality in outcomes: An integrated 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., & Kuhlman, D.M.. (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, PA.M., Otten, W., De Bruin, E.M.N., & 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., & Semin-Goossens, A. (1998). The boundaries of reciprocal cooperation. *European Journal of Social Psychology, 28*, 847-854.

Van Vugt, M., Marteens, R.M., & Van Lange, P.A.M. (1995). Car versus public transportation? The role of social value orientations in real-life social dilemmas. *Journal of Applied Social Psychology, 25*, 258-278.

Weber, J.M., Kopelman, S., & Messick, D.M. (2004). A conceptual review of decision making in social dilemmas: Applying a logic of appropriateness. *Personality and Social Psychology Review, 8*, 281-307.

Table 1

Regression Analysis Predicting Amount of Contribution from Social Value Orientation, Group Size, Time Perspective, and their Interaction.

	Individual Parameters			Overall Model	
Model Predictor	Beta	t	p	R^2	F
				.019	.487
SVO	.086	.986	.326		
Group Size	-.041	-.471	.638		
Time Perspective	.095	1.096	.275		
SVO x TP	.048	.533	.595		
TP x GS	-.006	-.071	.943		

Note. N = 135. SVO = Social Value Orientation, TP = Time perspective, GS = Group size.

Table 2

Hierarchical Regression Analysis Predicting Amount of Contribution from Social Value Orientation, Individual Self-Efficacy, Collective Self-Efficacy, Group Size, Time Perspective, and their Interactions.

	Individual Parameters			Overall Model	
Model Predictor	Beta	t	p	R^2	F
Step 1				1.019	.409
SVO	.076	.839	.403		
ISE	.055	.578	.558		
CSE	.013	1.439	.147		
GS	-.026	-.289	.773		
TP	.072	.788	.432		
Step 2				.711	.698
SVO x TP	.070	.778	.438		
GS x TP	-.027	-.297	.767		
CSE x TP	-.059	-.629	.530		
ISE x TP	-.041	-.442	.659		

Note. *N* = 135. SVO = Social Value Orientation, TP = Time perspective, ISE = Individual self-efficacy, CSE = Collective self-efficacy, GS = Group size.

Table 3

Hierarchical Regression Analysis predicting amount of donation from Benevolence, Universalism, power and their Interaction with Time Perspective.

	Individual Parameters			Overall Model	
Model Predictor	Beta	t	p	R^2	F
				.031	1.037
Step 1					
Benevolence	.035	.329	.743		
Universalism	-.081	-.771	.442		
Power	-.130	-1.398	.165		
TP	.111	1.242	.217		
Step 3				.065	1.257
TP x Universalism	.000	-.003	.998		
TP x Benevolence	.122	1.137	.258		
TP x Power	.119	1.289	.200		

Note. N = 135. TP = time perspective.

Table 4

Hierarchical Regression Analysis Predicting amount of Donation from Social Value Orientation, Individual Self-Efficacy, and their Interaction.

	Individual Parameters			Overall Model	
Model Predictor	Beta	t	p	R^2	F
Step 1				.014	.912
SVO	.056	.653	.515		
ISE	.08	.929	.355		
Step 2				.046	2.118
SVO x ISE	-.181	-2.117	.036		

Note. *N* = 135. SVO = Social Value Orientation and ISE = individual self-efficacy.

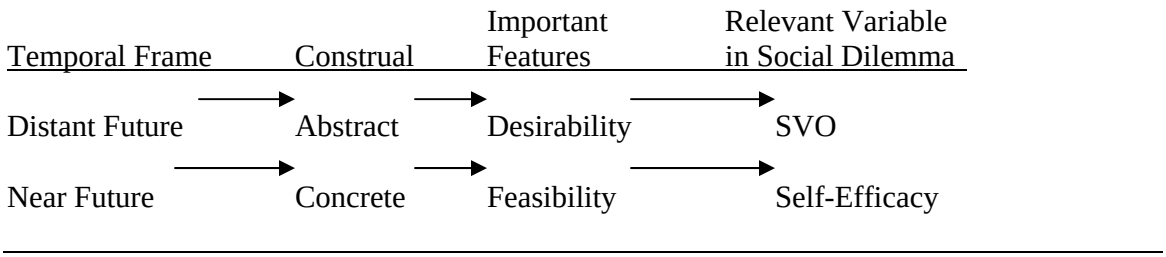
Table 5

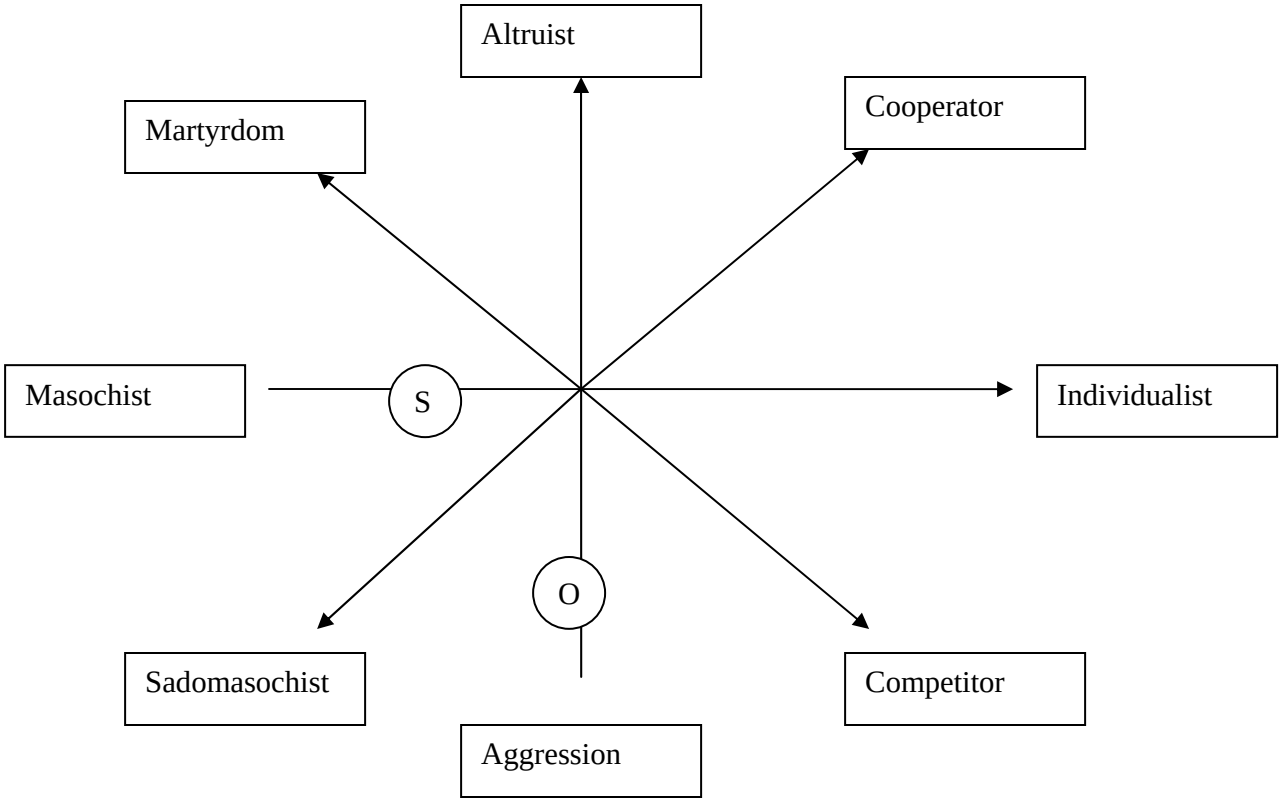
Hierarchical Regression Analysis Predicting Individual Self-Efficacy (Model 1) and Collective Self Efficacy (Model 2) from Social Value Orientation, Group Size, Time Perspective, and their Interaction.

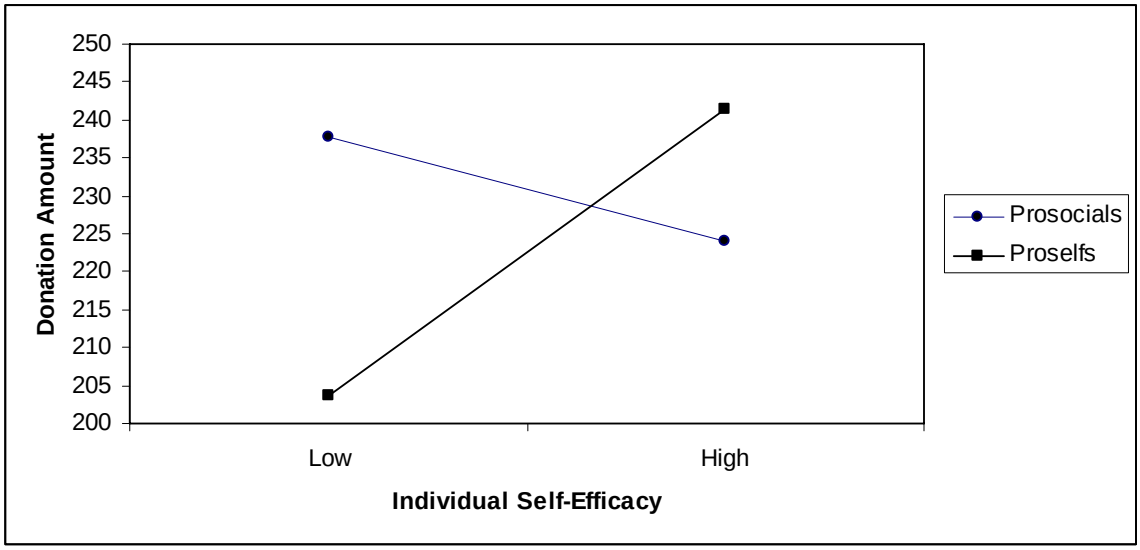
	Individual Parameters			Overall Model	
Model Predictor	Beta	t	p	R^2	F
MODEL 1: (Individual SE)				.008	.797
Step 1					
Time Perspective	.23	.255	.799		
SVO	.033	.324	.746		
Group Size	-.048	-.543	.588		
Step 2				.018	.872
SVO x TP	-.085	-.945	.347		
GS x TP	.02	.216	.829		
SVO x GS	-.073	-.739	.461		
MODEL 2: (Collective SE)				.018	.781
Step 1					
Time Perspective	.168	1.853	.066		
SVO	.087	.877	.382		
Group Size	-.02	-.23	.818		
Step 2				.045	1.001
SVO x TP	-.086	-.975	.331		
GS x TP	.126	1.386	.168		
SVO x GS	.108	1.112	.286		

Note. *N* = 135. SVO = Social Value Orientation, TP = Time perspective, GS = Group size.

All R squared change statistics were non-significant.


Temporal Frame
Construal
Important Features
Relevant Variable in Social Dilemma
Distant Future
Abstract
Desirability
SVO
Near Future
Concrete
Feasibility
Self-Efficacy


Altruist
Cooperator
Martyrdom
Masochist
S
Individualist
O
Sadomasochist
Competitor
Aggression


250
245
240
235
230
225
220
215
210
205
200
Donation Amount
Low
High
Individual Self-Efficacy
Prosocials
Proselfs

MATERIALS

The Half Ring Measure

Instructions given to participants

This task deals with decision making. As you will soon see, we'll be asking each of you to make choices in a series of decision problems. We fully expect that different people may have different preferences, and we are interested in knowing what choice YOU, as an individual, prefer most in each decision problem. So, during this task, please make the choices you think are best.

In the upcoming decision tasks, you have been randomly paired with another person whom we refer to simply as other. You will never knowingly meet or communicate with this other, nor will (s)he ever knowingly meet or communicate with you. In this decision task, both you and the other will be making choices by circling the letter A or B on your response sheet. Your own choices will produce points for yourself and the other. Likewise, the other's choice will produce points for him/her and for you. Therefore the TOTAL number of points you receive depends on your own choice and the other's choice as well. Similarly, the other's TOTAL points depend on his/her choices and your choices as well. An example of the decision task is displayed below.

	A	B
Self	100	60
Other	80	0

In this example, if you choose A you would receive 100 points for yourSelf and the Other would receive 80 points. If you choose B you would receive 60 points for yourSelf and the Other would receive 0. So, you see that your choice influences both your own payoffs and the payoffs of the other person as well. Remember that the other person is also choosing between A and B. Look at the decision problem from his/her point of view. If (s)he chooses A, then (s)he receives 100 points for him/herself, and you receive 80. If (s)he chooses B, then (s)he receives 60 points for him/herself and you receive 0. So, you also see that the other person's choice influences both his/her own payoffs and your own payoffs as well.

Thus, you own TOTAL payoff, the total number of points you receive on each decision problem, is determined by your own choice in combination with the choice of the other person. Likewise, the other person's TOTAL payoff is determined by his/her own choice in combination with you choice.

In just a moment, we will ask you to make a series of decisions. Before you begin we want to ask you to imagine that the points involved with the decisions have value to you: specifically, the more of them you accumulate the better. Also, imagine that the other person feels about his/her own points the same way; the more of them (s)he accumulates, the better. For each decision, make the choice the YOU, for whatever reason, consider to be the best. Please indicate you choice by circling A or B for each of the 24 decision tasks below. Choose the column [A or B] that YOU consider to be the best choice, for whatever reason.

	A	B
1.	0	13
	100	99

	A	B
2.	13	26
	99	97

	A	B
3.	26	38
	97	92

	A	B
4.	38	50
	92	87

	A	B
5.	50	61
	87	79

	A	B
6.	61	71
	79	71

	A	B
7.	71	79
	71	61

	A	B
8.	79	87
	61	50

	A	B
9.	87	92
	50	38

	A	B
10.	92	97
	39	26

	A	B
11.	97	99
	26	13

	A	B
12.	99	100
	13	0

	A	B
13.	100	99
	0	-13

	A	B
14.	99	97
	-13	-26

	A	B
15.	97	92
	-26	-38

	A	B
16.	92	87
	-38	-50

	A	B
17.	87	79
	-50	-61

	A	B
18.	79	71
	-61	-71

	A	B
19.	71	61
	-71	-79

	A	B
20.	61	50
	-79	-89

	A	B
21.	50	38
	-87	-92

	A	B
22.	38	26
	-92	-97

	A	B
23.	26	13
	-97	-99

	A	B
24.	13	0
	-99	-100

Schwartz's Value Scale

Directions: Shown below are a number of things people might value. Using the scale shown below, please rate the extent to which each value is important to you. Please place your rating in the space provided to the left of each item. For each value, complete the following sentence: **As a guiding principle in my life _____ is:**

-1 Opposed to My Values	0 Not Important	1	2	3 Important	4	5	6 Very Important	7 Of Supreme Importance

____ **equality** – equal opportunity for all

____ **inner harmony** – at peace with myself

____ **social power** – control over others, dominance

____ **pleasure** – gratification of desires

____ **freedom** – freedom of action and thought

____ **a spiritual life** – emphasis on spiritual not material matters

____ **sense of belonging** – feeling that others care about me

____ **social order** – stability of society

____ **An exciting life** – stimulating experiences

____ **meaning in life** – a purpose in life

____ **politeness** – courtesy, good manners

____ **wealth** – material possessions, money

____ **national security** – protection of my nation from enemies

____ **self-respect** – belief in one's own worth

____ **reciprocation of favors** – avoidance of indebtedness

____ **creativity** – uniqueness, imagination

____ **a world at peace** – free of war and conflict

____ **respect for tradition** – preservation of time-honored customs

____ **mature love** – deep emotional and spiritual intimacy

____ **self-discipline** – self-restraint, resistance to temptation

____ **detachment** – from worldly concerns

____ **family security** – safety for loved ones

____ **social recognition** – respect, approval by others

____ **unity with nature** – fitting into nature

____ **a varied life** – filled with challenge, novelty, and change

____ **wisdom** – a mature understanding of life

____ **authority** – the right to lead or command

____ **true friendship** – close, supportive friends

____ **a world of beauty** – beauty of nature and the arts

____ **social justice** – correcting injustice, care for the weak

____ **independent** – self-reliant, self sufficient

____ **moderate** – avoiding extremes of feeling and action

____ **loyal** - faithful to my friends, group

____ **ambitious** – hardworking, aspiring

____ **broad-minded** – tolerant of different ideas and beliefs

____ **humble** – modest, self-effacing

____ **daring** – seeking adventure, risk

____ **protecting the environment** – preserving nature

____ **influential** – having an impact on people and events

____ **honoring of parents and elders** – showing respect

____ **choosing own goals** – selecting own purposes

____ **healthy** – not being sick physically or mentally

____ **capable** – competent, effective, efficient

____ **accepting my portion in life** – admitting to life's circumstances

____ **honest** – genuine, sincere

____ **preserving my public image** – protecting my "face"

____ **obedient** – dutiful, meeting obligations

____ **intelligent** – logical, thinking

____ **helpful** – working for the welfare of others

____ **enjoying life** – enjoying food, sex, leisure, etc

____ **devout** – holding to religious faith and belief

____ **responsible** – dependable, reliable

____ **curious** – interested in everything, exploring

____ **forgiving** – willing to pardon others

____ **successful** – achieving goals

____ **clean** – neat, tidy

Instructions to Public Goods Game

In this experiment you will be asked to make a decision. Imagine that you are making this decision tomorrow (a year from now). When making this decision, think about what you would decide to do tomorrow (a year from now).

You are participating in a group study that involves 10 (100) people. Of course all these people are not currently in the lab, but will participate during different times. In this study you and your group will have an opportunity to win money. Each group member will be endowed 300 pennies (3 dollars) and will be asked to contribute between 0 and 300 pennies to a group fund. If the group fund reaches 2,000 pennies (20,000), then each group member will be rewarded five dollars. However, if the group fund fails to reach 2,000 (20,000) pennies, then all group members will fail to receive the bonus five dollars. If your group is selected to receive money, each individual will receive the amount that is left over after making a contribution of 0 to 300 pennies plus the bonus five dollars if attained by the size of the group fund.

So you have an opportunity to win between 0 and 8 dollars. A random selection procedure will choose one of five groups to receive money. Therefore, you have a 1 in 5 chance of being selected to receive money. You will be asked to indicate your mailing address after the experimental session is finished, in order for a check to be sent approximately 8 weeks after completion of the study.

Contribution decision

Temporal manipulation placed here.

You are given 300 pennies. You may choose to contribute to the group fund between 0 and 300 pennies. Remember, if chosen to win money, you will receive the amount left over after making the contribution plus the bonus if achieved by the group fund. Your group must have 2,000 (20,000) pennies in the group fund in order for all members to acquire the bonus five dollars. Your group will not be aware of the amount that you contribute.

How much do you choose to contribute to the group? _____ pennies

Quiz for Understanding of Public Goods Game

Please answer the following questions to demonstrate that you understand the current scenario.

1. How many people do you have in your group? _____

2. What amount of money is each participant given as an endowment? _____

3. How much money must be contributed to the group fund to achieve the bonus? _____

4. What is the amount of the bonus? _____

5. What is your chance in being randomly selected to win money? _____

6. If you are selected to win money, how much would you win if you decided to contribute 100 pennies and your group achieved the bonus? _____

7. If you are selected to win money, how much would you win if you decided to give 300 pennies to the group fund and your group failed to achieve the bonus? _____

Post Experimental Questionnaire

On a scale from 0 to 100, indicate the likelihood that your contribution actual make a difference in the group attainment of the bonus. 0 = my contribution makes no difference, 100 = my contribution make an important difference. _____

On a scale from 0 to 100, indicate the likelihood that your group will acquire the bonus. 0 = no chance we will acquire the bonus, 100 = we will definitely acquire the bonus.

_____

Next, rank-order the following statements according to how they best describe your actions in this experiment. Please indicate which statement best describes your actions in this experiment. Place a one next to the description that best describes your action. Next, rank the rest of the statements according to how you feel they best describe you actions. This includes placing the number two after the second best description and a number three after the third best description, and so on.

1. influencing the attainment of bonus _____
2. pressing keys _____
3. reading text _____
4. making a choice of what to contribute _____