2014

Do Angry Birds Flock Together? The Effects of the Aggressive Personality Trait on the Development of Mutual Cooperation

Adam W. Stivers
Gonzaga University, stivers@gonzaga.edu

DO ANGRY BIRDS FLOCK TOGETHER? THE EFFECTS OF THE AGGRESSIVE PERSONALITY TRAIT ON THE DEVELOPMENT OF MUTUAL COOPERATION

by

Adam Ware Stivers

A thesis submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Master of Arts in Psychology

Fall 2014

DO ANGRY BIRDS FLOCK TOGETHER? THE EFFECTS OF THE AGGRESSIVE PERSONALITY TRAIT ON THE DEVELOPMENT OF MUTUAL COOPERATION

by

Adam Ware Stivers

Approved: _____
D. Michael Kuhlman, Ph.D.
Professor in charge of Thesis on behalf of the Advisory Committee

Approved: _____
Robert F. Simons, Ph.D.
Chair of the Department of Psychological and Brain Sciences

Approved: _____
George H. Watson, Ph.D.
Dean of the College of Arts and Sciences

Approved: _____
James G. Richards, Ph.D.
Vice Provost for Graduate and Professional Education

ACKNOWLEDGMENTS

First I would like to thank my advisor, Mike Kuhlman who has helped me through an enlightening experience as a student at the University of Delaware. He has always been eager to help explore my pursuits in a wide range of research ideas with both intellectual and material support. His enthusiasm for research has been a continual inspiration and he has opened up possibilities all over the world for me. For the current project, his expertise was essential for the design of both studies, generating measures adequate to test the raw ideas and a thorough design for the second study.

I would like to thank Ryan Murphy and Kurt Ackermann at ETH Zurich. Their feedback was helpful in the brainstorming of the study and strongly contributed to my understanding of social value orientation and how it is measured. They also assisted with the scoring of the Slider Measure used in the second study.

I would like to thank Gokhan Karagonlar and Madeline Page. As my academic "big brother" and "big sister", they both helped welcome me to the University of Delaware and provided excellent role models for what it takes to perform graduate level research.

I would like to thank JP Laurenceau. The first draft of this thesis was written as a term paper for his regression class. In that class, I gained many of the basic skills used to conduct the analyses for this paper. The class also provided me with the impetus to organize my ideas, create a plan for data analysis and put it all into writing.

Finally, I would like to thank Sam Gaertner, both for his time as a committee member on this project and for introducing me to many of the theories and research in two of my early classes in Delaware. Sam has always offered thought provoking questions, good advice, and a great deal of encouragement.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Two studies investigated the relationship between aggression and Social Value Orientation (SVO), a trait like predisposition to maximize Cooperative, Individualistic or Competitive goals. In Study 1, which was correlational, participants' aggression was measured via questionnaire and SVO by a series of decisions in which points are allocated to self and an anonymous other. It was found that participants with a Cooperative SVO scored lower on aggression than those with either an Individualistic or Competitive SVO. In Study 2, using an experimental design, participants were randomly assigned to receive information that their partner was high in aggression, or low in aggression and a third group received no information. Study 2 showed the same relation between participant SVO and aggression found in Study 1. Contrary to predictions, there were no effects for the aggression of the partner. Together these studies provide support for a weak, but replicable relationship between participants' aggression and their SVO. Future investigations may shed light on the nature of this relationship by testing personality and situational factors that may moderate the relation between SVO and aggressive personality.

Chapter 1

INTRODUCTION

The current research is focused on the implications of aggressive personality for cooperation in socially interdependent relationships. Cooperation is a fundamental concern for the success of individuals, groups, and societies, in which many challenges take the form of a social dilemma. In a social dilemma a decision maker must choose between alternatives that provide the greatest benefit for self at a cost to one's group and alternatives that provide group benefit at a cost to self. (Dawes, 1980; Komorita & Parks, 1996; Van Lange, Balliet, Parks, & Van Vugt, 2013). This conflict of interests between the individual decision maker and his/her group can make it particularly difficult for groups to arrive at cooperation because each decision maker needs to 1) make some individual sacrifice to pursue a *goal* of cooperation, and 2) *expect* that others in the group will also make cooperative choices (Pruitt & Kimmell, 1977). If an individual does not expect others to cooperate, they risk being victims of the "sucker effect"; having their cooperation exploited by non-cooperative partners (Kerr, 1983). In order to understand social dilemma behavior, it is important that we consider what types of people are more likely to hold cooperative *goals* and also what types of people are *expected* to cooperate. The current research addresses both of these questions, specifically focusing on the personality trait of aggression as both a

predictor of cooperative goals and also as a signal for whether to expect cooperation from others.

Two studies were conducted to test the relationship between aggression and cooperation. In Study 1, the correlation between a person's aggression and his/her cooperative motivation was tested with a questionnaire. In Study 2, two-person groups were used to test whether both one's own trait aggression and the other person's trait aggression influence cooperative motivation. For the remainder of this thesis, the other person will be referred to simply as the other. This research provides an examination of how cooperative motivation relates to one's own aggression, other's self-reported aggression, and the similarity between own aggression and other's aggression.

1.1: Own Aggression

The first question is whether more aggressive individuals have less cooperative social motives. One way to examine such motives is through a series of allocation decisions that combine to express a Social Value Orientation (SVO). In SVO research, individuals typically make choices in a simple decision task known as "decomposed games". (See Appendix B) Such choices affect themselves and a hypothetical other. Based on the individual's choices in these games, he/she can classified into a large number of SVO categories that vary in terms of their willingness to cooperate with the other. Although there are many possible SVO categories (MacCrimmon & Messick, 1976), the three SVOs originally identified by Messick and

McClintock (1968), and that are by far the most common in normal populations are relevant to the current studies. The three orientations are:

1) Joint gain maximization (J): preference to maximize the combined outcome (own +, other +).
2) Own gain maximization (O): preference to maximize own outcome and indifference to other's outcomes (own +, other 0).
3) Relative gain maximization (R): preference to maximize the difference between own and other's outcomes (own +, other -).

The 3 categories of SVO (Js, Os, and Rs) have been shown in many studies to predict both gaming behavior (e.g., Kuhlman & Marshello, 1975) and a variety of other prosocial behaviors such as charitable donations (Komorita & Parks, 1996; Van Lange et al., 2013). For both practical and empirical reasons, SVO researchers often combine the O and R into one group called "ProSelfs" in contrast to the "ProSocials" (Js) who are distinguished by a positive regard for other's (e.g., Balliet, Parks, & Joireman, 2009).

Non-cooperative behavior is often viewed as aggressive by definition, and research has demonstrated that individuals often respond to a non-cooperative other with aggression or anger. As an example, a recent EEG study (Wang et al., 2013) had participants play a Chicken Game while measuring the EEG response to outcomes in the game. Wang et al (2013) found that FRN amplitude (an EEG component related to subjective evaluation of negative events) was largest on trials where the participant's cooperation was exploited by the other. This was interpreted as evidence

that other's noncooperation was viewed most negatively by the participants, possibly as an act of aggression. Additional evidence for the link between aggression and cooperation can be found in a recent Ultimatum Game (UG) study by Karagonlar and Kuhlman (2013). In the game, participants were presented with an unfair offer of $2 for them and $8 for the ostensible proposer. The participant then had the option to accept the unfair $2 offer or reject it, in which case neither they nor the proposer would receive anything. It was demonstrated that individuals higher in both trait and state aggression were less likely to accept unfair offers from an ostensible proposer, choosing instead the non-cooperative option of rejection that would result in $0 for each player. Thus, aggression appears to be involved with cooperation, both in terms of reactions to the behavior of others, and also as a cause of one's own behavior.

Based on these results, the first hypothesis (H_1) is that Social Value Orientation will correlate with the personality trait of aggression: ProSocials (Js) will score lower on aggression than ProSelfs (Os and Rs). In both studies to reported here, this hypothesis will be tested via correlation of a questionnaire measure of aggression with a measure of SVO as assessed by decomposed games. Prior research on aggression demonstrates that non-cooperation is perceived in aggressive terms and that aggressive individuals are more likely to respond non-cooperatively *when provoked.* The current studies will provide a test of whether trait aggression is predictive of a general tendency to compete, absent any provocation from others.

1.2: Other's Aggression

The second hypothesis concerns the aggression of the other. In Study 2, the main focus was determining if information about an anonymous other's aggressiveness affects one's own SVO. If an individual perceives an interaction partner as highly aggressive they may also expect them to choose more non-cooperative behaviors. Social dilemma research has demonstrated that even cooperatively oriented people tend to compete when paired with competitive partners (Kuhlman & Marshello, 1975), adopting a strategy known as tit-for-tat (Axelrod, 1981). In past research, non-cooperative behavior has provoked aggressive responses (Twenge, Baumeister, Tice, and Stucke, 2001) and unjustified expressions of anger have evoked non-cooperation in a public goods social dilemma (Stivers, 2009). Individuals will frequently compete in response to other's aggressive behavior. Study 2 will expand this line of research to assess whether an individual's SVO will be affected by a belief that the other has an aggressive personality. Study 2 will test the second hypothesis (H2) that SVO will become less cooperative if they believe their partner is high in aggression.

1.3: Partner Similarity

In addition to learning how aggressive their partner is in Study 2, participants also learn how similar to them their partner is in terms of aggression. Some participants will be similar to their partner in terms of aggression (both high or both low) while other participants will be different (participant high/other low, or participant low/other high). This will allow for a test of the prediction that individuals will be more motivated to cooperate with others who are similar to them in terms of

aggression. People have an evolutionary motive to be more cooperative with similar others because they are more likely be more closely related genetically. Benefiting genetically similar others can serve the function of ensuring that our genes are passed on to the next generation. Social psychological research has provided extensive evidence of this similarity effect; examples include social comparison theory (Festinger, 1954) and in-group favoritism effects (Brewer, 1979). Indeed, research has shown that the tendency to be more cooperative to others who are similar extends beyond physical similarities to personality traits and attitudes (Martin et al., 1986; Waller et al., 1990).

Recent research in social dilemmas has revealed a strong tendency for individuals to cooperate with other's based on even mundane and seemingly random similarities (Fischer, 2009; Fischer, 2012). To explain this effect, Fischer has developed the Subjective Expected Relative Similarity (SERS) theory where an individual's perceived similarity in relation to a situationally determined threshold for similarity predicts a willingness to cooperate with similar or dissimilar others. The current research will provide a rather strict test of Fischer's SERS theory. It will examine whether individuals will be more likely to cooperate with similar others even when the similarity is based on a trait that may be considered undesirable or threatening to the perceiver. Thus, the third hypothesis (H3) is that people will be more cooperative when their partner is similar in terms of aggression. The third hypothesis is not in complete opposition to the first two hypotheses, but the prediction

is different for one specific combination of own and partner aggression. When both people are high in aggression, the first two hypotheses predict competition between the two players. In contrast, the third hypothesis predicts that similarity in high aggression should elicit cooperation. If one or both of the partners are low in aggression, the three hypotheses are non-contradictory.

Chapter 2

STUDY 1: AGGRESSION AND SOCIAL VALUE ORIENTATION

In an online survey, participants were asked to complete measures of SVO and aggression. The correlation between these two measures provides a test of H1, that individuals who are more cooperatively oriented are less aggressive.

2.1: Method

Four hundred ninety-nine undergraduates (275 female) at the University of Delaware fulfilling a research requirement were administered a battery of online questionnaires that included both the Zuckerman-Kuhlman Personality Questionnaire Aggression Scale (ZKPQ Aggression; Appendix A; Zuckerman, M., 2002) and the 12-item Ring Measure of Social Value Orientation (Appendix B; Karagonlar & Kuhlman, 2013; Liebrand, 1984).

The Aggression scale of the ZKPQ is a well validated measure of trait aggression with a biological basis (Zuckerman, 2002; Zuckerman, Kuhlman, & Camac, 1988; Zuckerman, Kuhlman, & Joireman, 1993; Zuckerman, Kuhlman, & Thornquist, 1991). As described in a recent review of the ZKPQ (Joireman & Kuhlman, 2004) the aggression scale has shown internal reliability in US samples (α = .76 for males and females) and in international samples ($0.61 \leq \alpha \leq 0.75$ for Spanish, German, Catalan, Chinese, and Japanese samples). The measure has demonstrated a

test-retest reliability of 0.78. A factor analysis yielded strong convergent validity with Costa and McCrae's (1992) NEO Agreeableness scale with factor loadings of -0.72 for the ZKPQ Aggression scale and 0.81 for the NEO Agreeableness scale. Discriminant validity has been demonstrated by non-significant correlations with several scales measuring non-related constructs.

The scale has 17 true/ false items that assess both verbal aggression (i.e., "Whenever people disagree with me I cannot help getting into an argument with them.") and hostility (i.e., "I have a very strong temper."). Six of the 17 items are reverse coded (i.e., "I am always patient with other's even when they are irritating.") To score the scale participants receive 1 for each aggressive response and 0 for each non-aggressive, total scores may range from 0 to 17.

The Ring Measure (Appendix B) classifies an individual's SVO based on a weighting of preferences for outcomes to self and other. Since the cooperative choices provide some benefit to other's and non-cooperative choices often do harm to others, it was expected that people with a Prosocial SVO (Js) would report less aggression than those with a Proself SVO (Os and Rs).

2.2: Results

A 2 (Sex) by 3 (SVO) analysis of variance was conducted with the ZKPQ Aggression score as the dependent variable. The 2-df SVO effect was partitioned into two 1-df contrasts. Following common practice in SVO research, one contrast

compared the two types of ProSelfs (Os and Rs), and the second compared ProSocials with ProSelfs.

The main effect for sex was marginally significant, with a trend that males (Mn= 6.79) were more aggressive than females (Mn = 6.34); $F(1,493) = 2.833$, $p = 0.093$, $\eta^2 = 0.57\%$). The interaction between Sex and SVO was not significant ($p = 0.76$).

A main effect for SVO was observed. ($F(2,493) = 4.24$, $p = 0.015$, $\eta^2 = 1.6\%$), and Figure 1 shows average aggression scores for the three SVO categories. The planned contrasts demonstrated that Os (Mn = 7.1) did not differ from Rs (M = 6.49). The absence of an O versus R difference is common in the SVO literature, and justifies their combination into a single group of ProSelfs for the next contrast. This contrast showed that Js (Mn = 6.14) were less aggressive than ProSelfs (Mn=6.795); $F(1,493) = 4.4127$, $p = 0.036$, $\eta^2 = 0.89\%$). A Scheffe' post hoc tests revealed that Js were less aggressive than Os ($p = .014$), but Js were not less aggressive than Rs. Although the Scheffe' test is very conservative, the large sample size in this study reduces the likelihood that this is a matter of insufficient power.

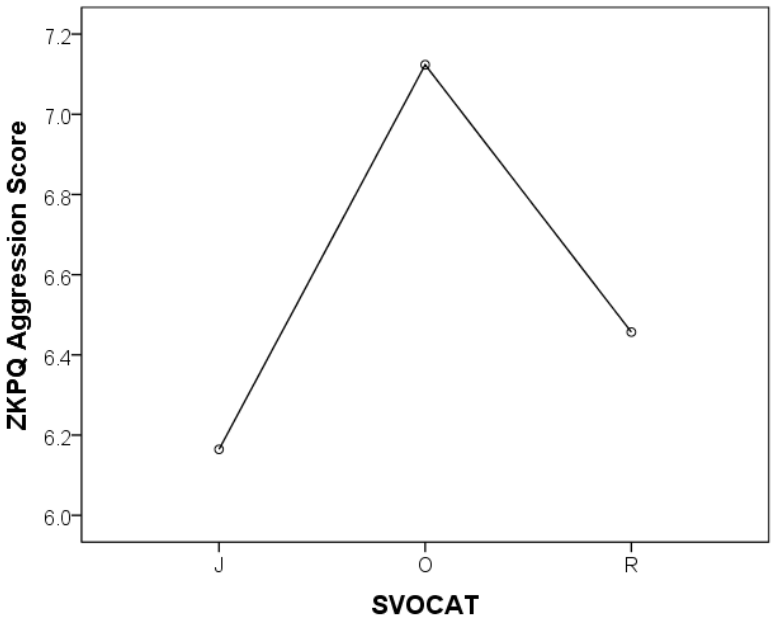


Figure 1 Mean levels of aggression for J (Cooperative), O (Individualistic), and R (Competitive) Social Value Orientations.

2.3: Discussion

The marginal effect of sex provides limited support for the idea that males may be more aggressive than females, but (1) this was not a focus of the present study and (2) the absence of a Sex by SVO interaction suggests that the SVO-aggression relationship is likely to be the same in males and females. For SVO, the ProSocial-ProSelf contrast supports H1 that ProSocials are the least aggressive group. However, this effect may be qualified by the finding that there is no statistical difference (by Scheffe' test) between Js and Rs. The unexpectedly low aggression in Rs may be explained by a phenomenon known as "aversive competition", where individuals are motivated to compete based on a suspicion of the intentions of other's rather than a

malicious attitude towards others (Kuhlman, Camac, & Cunha, 1986: Messick & Thorngate, 1967). While this explanation is appealing, further research is needed to draw conclusions about how specific motivations for competition relate to aggression. The results of Study 1 do show a relationship between aggression and cooperation, but it is a small effect and the data was collected in a partially exploratory manner with many other measures included. For this reason, Study 2 was conducted to provide a replication of the SVO-aggression relationship while taking into account alternative explanatory factors.

Chapter 3

STUDY 2: PARTNER AGGRESSION AND SVO

In Study 2 participants who completed Study 1 were randomly selected to take part in a second on-line survey where participants were told they were making decisions for themselves and another person. Here, the unknown other was depicted as either high or low in aggression for two treatment conditions. In a third control condition, no information about the other person was provided. Thus, the manipulation of partner aggression produced three conditions to which participants were randomly assigned:

1) Control condition with no partner information (CON)

2) Low Aggression Partner condition (LAG)

3) High Aggression Partner condition (HAG)

In addition to providing a replication of Study 1, the goals of Study 2 were to test whether knowledge of other's aggressiveness affects SVO, and whether similarity in terms of own and other's aggression can affect SVO. Hypothesis 2 would be supported if cooperation was highest in the LAG condition, followed by the CON condition, and finally the HAG condition. Evidence for Hypothesis 3 would be based on higher cooperation for participants who have aggression scores similar to the other person.

3.1: Method

3.1.1: Participants

Participants were 196 introductory psychology students at the University of Delaware satisfying a research participation requirement. Fifty six participants were omitted from the dataset for various reasons. First, 8 participants did not take part in Study 1; they were recruited by mistake and there was no data for the participant's aggression. Second, 23 participants could not be scored on the Slider Measure of SVO (which measure is explained below) because they either had missing responses or an SVO profile that was internally inconsistent. Third, on the Slider Measure, 20 made response errors. Fourth, there were 4 participants who reported some suspicion as to whether the other player was a real person when asked "*What do you think the purpose of this study was?"* and/or *"Did you find anything strange or unusual about this study?"*.

The criteria for exclusion based on the other's aggression manipulation and the Slider Measure are described in more detail in the sections below that are devoted to each of those measures. Participants in the third and fourth exclusion categories described above are not included in any of the analyses reported here, but all analyses were also conducted with these participants included and the results were not statistically different for any analyses. These results can be provided upon request. This leaves a sample of 140 participants (88 female) for analyses.

3.1.2: Procedures

Data for the participant's aggression was collected in Study 1 approximately 2 months prior to the Study 2 experimental session. The experimental session for Study

2 was an on-line questionnaire assigned to participants who were selected based on their completion of the pretesting measures given at the time of Study 1.

Participants were instructed that they would be completing a social decision task with an anonymous other. Before completing the social decision task, (the Slider Measure, explained below) participants in the treatment conditions (high aggression other, or HAG and low aggression other, or LAG) were shown the results of a "Personality Characteristics Questionnaire" (PCQ) that ostensibly showed the other's responses to a set of 17 personality items. The PCQ items were identical to the ZKPQ measure of aggression that participants had completed about 2 months prior. Participants were not explicitly told that the purpose of the PCQ was to measure aggression. After viewing the other's PCQ responses, participants were asked to recall each of those 17 responses. It was determined a priori' that participants who failed to get at least 12 correct would be removed from analyses; there were no such participants. In the control condition (CON), participants learned nothing about the other.

Next, participants completed a decision task to determine their SVO at the time of Study 2. This measure of SVO was the Slider Measure of Social Value Orientation (Murphy, Ackermann, & Handgraaf, 2011), which is described below. Finally, participants were asked a series of questions assessing their evaluations of the other including a question about other's aggression. These questions served as a manipulation check, ensuring that participants believed that high aggression other's (HAG) were aggressive and that low aggression other's (LAG) were not aggressive.

3.1.3: Measures

3.1.3.1: Own Aggression

All participants completed the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) Aggression Scale (Zuckerman, 2002) as part of Study 1. In Study 2 the ZKPQ aggression scale was also used to provide participants with personality information about the other.

3.1.3.2: Other's Aggression

In order to demonstrate the other's aggression, participants were shown the other's responses to the 17 items of the ZKPQ Aggression scale. The ZKPQ Aggression scale was used for three reasons: First, the true/ false format makes it easier for participants to identify, interpret, and remember the other's responses. Second, the limited number of response options makes it more likely that the other's responses will be a closer match to the participant's own responses in the self / partner similarity conditions (both high in aggression or both low in aggression) and more clearly opposite in the self /other difference conditions (one person high in aggression and the other person low in aggression). For example, a "true" response to an item on the ZKPQ aggression scale will be a perfect match to the other's "true" response. In contrast, on a 7 point scale ranging from strongly agree to strongly disagree, there would be some disparity between an individual with a 5 score and an individual with a 7 score although they would be categorized as a match on that item in this study. Third, the variety of items on the ZKPQ aggression scale allows me to address several

dimensions of aggression including rudeness, short temper, violence, and verbal aggression.

The responses shown in the PCQ were either all aggressive responses (Appendix A) or all non-aggressive responses, depending on which of the two treatment conditions the participant was randomly assigned to. Following presentation of the other's PCQ responses, the next computer screen asked participants to recall those responses. The ZKPQ Aggression scale has a true/ false format with 11 affirmative items and 6 reverse coded items, so 12 correct responses was used as a threshold because a participant could obtain 11 correct answers by responding "true" to every statement (high aggression condition) or "false" to every statement (low aggression condition). This criterion for exclusion was established a priori. This manipulation generated three conditions:

1) LAG: other is low in aggression (0 out of 17 aggressive responses)
2) CON: control condition, participant receives no information about other.
3) HAG: other is high in aggression (17 out of 17 aggressive responses)

3.1.3.3: Slider Measure of SVO

In Study 2 SVO was assessed with the so-called Slider-Measure. (Appendix C: Murphy, Ackermann, & Handgraaf, 2011) The Slider Measure has a strong test-retest reliability ($\alpha = 0.92$) and convergent validity with the Ring Measure (Liebrand, 1984), ($r = .65$) (Murphy, Ackermann, & Handgraaf, 2011). The Slider Measure was used

instead of the Ring Measure (employed in Study 1) for two reasons. First, using an alternative measure of SVO provides for a more robust test of the SVO-participant aggression relationship. Second, like the Ring Measure, the Slider provides both a categorical (J, O, R) classification, as well as a continuous measure of cooperativeness. We used this continuous measure as the dependent variable in tests of the replicablity of Hypothesis 1 (from Study 1) and tests of Hypotheses 2 and 3.

The Basic Slider Measure uses a series of 6 items where participants select allocations for "self" and "other" along a continuum of 9 options. Based on the participant's choices in the 6 items, a continuous measure of SVO (the SVO angle) can be determined; the higher the angle, the more cooperative the SVO. The SVO angle was used to test three hypotheses:

1) Participant aggression will be negatively related to SVO: as aggression increases, SVO angle will decrease.
2) The manipulation of partner aggression will be related to SVO angle such that SVO angle will decrease from the HAG to the CON to the LAG conditions.
3) Individuals who are similar to their partner in aggression (using a difference score) will have a higher SVO angle than individuals who are dissimilar to their partner in aggression.

As mentioned above, some participants were excluded from analyses based on inconsistent responses to the Slider Measure as per the recommendations of Murphy, Ackermann, and Handgraaf (2011). There are two exclusion categories. First, participants were asked to choose one of 9 options corresponding to allocations for

self and other and were then asked to type in the amounts they had awarded. In some cases, the option chosen matched one type of allocation (i.e., 96 for self and 50 for other), but the participant typed in a different allocation (i.e., 70 for self and 70 for other). Twenty one participants who had at least one non-matching response were excluded. Second, some participants gave responses that were internally inconsistent. For example, they may have chosen to maximize other's gain at great expense to self in one choice, but then chose to minimize the other's outcomes at some expense to self in another option. Similar criteria for internal consistency have been frequently used for both the Ring Measure of SVO (Liebrand, 1984) and the Triple Dominance Measure of SVO (Van Lange, Otten, De Bruin, & Joireman, 1997).

3.1.3.4: Other Evaluations

After participants completed the Slider Measure, they were asked to make evaluations of the other on 8 different dimensions (Appendix D). Seven of the items asked participants to rate the other (from 1 (Not at all) to 7 (Very)) on the degree to which the other was aggressive, similar, trustworthy, moral, smart, selfish, and good. These evaluations were chosen because they specifically relate to aggression and other constructs that have demonstrated prior relationships with gaming behavior (Fischer, 2009; Fischer, 2012; Van Lange & Kuhlman, 1994; Yamagishi & Yamagishi, 1994).

Finally, participants were given the 1-item measure of Inclusion of Other in Self (IOS; Aron, Aron, and Smollan, 1992). The IOS (Appendix E) presents 7 Venn diagrams each presenting a circle for self and a circle for other. The diagrams vary in

the degree to which the self and other circles overlap and the responder indicates which diagram (degree of overlap) best represents the relationship between self and other (in this case the other person they made allocations to in the Slider Measure). The IOS scale has previously been related to SVO (Cornelissen, Dewitte, & Warlop, 2011) and may also have relationships with aggression and partner aggression. Aron, Aron, and Smollan (1992) reported test-retest reliabilities between 0.83 and 0.86; convergent validity was determined from a correlation ($r = 0.33$, $p < .01$) with the Relationship Closeness Inventory (Berscheid., Snyder, & Amato, 1989), and discriminant validity was determined from non-significant relationships with several non-relevant measures.

All evaluations were intended to serve as both manipulation checks and exploratory variables. If the manipulation of other's aggression was effective, it was expected that the other in the HAG condition compared to the control (CON) condition would be rated as more aggressive, less trustworthy, less moral, more selfish, less good, and less socially close. The same relationships should reverse for the LAG condition in relation to the CON condition. The key question used to determine the effectiveness of the manipulation is the question referring directly to aggression. With respect to H3, the effectiveness of the similarity manipulation was measured by the extent to which participants with similar aggression scores to their partner would also report the partner as more similar.

3.2: Results

All results reported are for data analyzed on the 140 participants who met the exclusionary criteria outlined above. Analyses with 20 participants with non-matching Slider Measure choices and 4 participants who reported suspicion about the cover story were also conducted with no discernible differences. The more conservative sample was used based on the recommendations of the Slider Measure authors (Murphy, Ackerman, & Handgraaf, 2011) and my belief that participants who did not believe in the authenticity of the partner would not provide valid data.

To test the 3 hypotheses, 3 separate ANOVA and Regression analyses were performed, each including sex as one of the independent variables. In the Study 2 sample, sex was not correlated with participant aggression ($r = -.023$, $p = .784$); together with Study 1, this is additional evidence for the lack of sex differences ZKPQ Aggression. Further, there were no main effects or interactions for sex in any of the analyses reported below.

3.2.1: Participant Aggression

To test H1 that participant aggression would predict SVO, Slider Measure angle was regressed on the participant's aggression score and sex. There was an overall effect for regression ($F(2,137) = 4.37$, $p = .014$, $R^2 = .06$). In support of Hypothesis 1, SVO angle decreased as participant's aggression increased ($\beta = -.238$, $t(137) = -2.872$, $p = .005$, $\eta^2 = 5.68\%$). This effect remained when an interaction term for sex and aggression was included in the model. This finding supports Hypothesis 1

and provides a replication of Study 1 findings using different methods with an overlapping sample. The difference in effect size for the aggression-SVO relationship (1.6% in Study 1 and 5.6% in Study 2) should be noted. In Study 1, SVO was a categorical variable, whereas in Study 2 it was continuous. As pointed out by Murphy, Ackerman and Handgraaf (2011) continuous measures of a construct tend to produce larger effect sizes than those obtained when the same construct is converted to discrete categories.

3.2.2 Partner Aggression

Partner aggression in Study 2 was manipulated between subjects, forming 3 conditions: control (CON), low aggression (LAG), and high aggression (HAG). A 3 (CON, LAG, HAG) by 2 (Sex) factorial ANOVA was conducted with SVO angle as the dependent variable. The mean SVO angle was highest in the LAG group (M = 19.02) followed by the CON group (M = 16.98) and the HAG group (M = 14.08). Although these mean values were in the predicted direction, no main effects were found to be significant. Planned contrasts showed no significant differences between the three aggression condition groups. Although H2 was not supported, a power analysis for the test of the main effect of condition (Power = .23) suggests that future replications of this study should use a larger sample size.

A test of the interaction between condition and sex revealed a marginal effect ($F(2,134) = 2.54$, $p = .082$, $\eta^2 = 3.7\%$). The means associated with this interaction are shown in Figure 2. Further tests did not have enough power to provide adequate tests

for simple effects, but examination of the graph suggests that sex could be an important moderator of aggression information effects. Again, future research with an increased sample size is clearly called for.

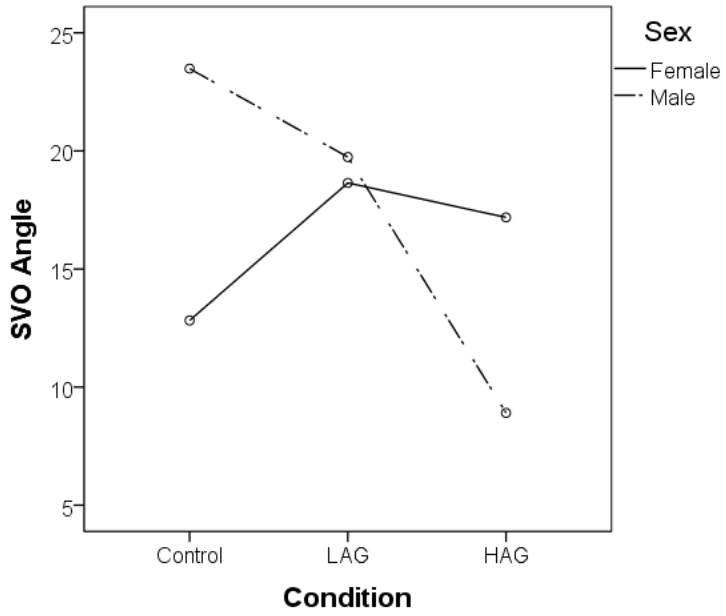


Figure 2 Differences in SVO angle (cooperativeness) for Male (dash) and Female (solid) participants in the CON, LAG, and HAG conditions.

3.2.3: Partner Similarity

The third hypothesis is that participants with a partner who was more similar in terms of aggression would be more likely to cooperate. To measure similarity, I generated a difference score with participant's own aggression score (0-17) subtracted from the aggression score of the partner (0 in LAG condition, 17 in HAG condition). The absolute value of the difference score was used as the measure of similarity.

Since participants in the control condition had no information concerning other's aggression, they were excluded from this analysis. The aggression difference score, along with sex of the participant, were used to predict SVO angle in a multiple regression analysis. The results did not support the hypothesis: all main effects and interactions were non-significant (p's > 0.25).

3.2.4: Manipulation Checks

In Study 2, other's aggression was manipulated by presenting participants with a list of other's responses to an aggression questionnaire. To ensure that participants actually perceived the other as more aggressive, a MANOVA was performed with condition (CON, LAG, HAG) as the predictor variable and each of the partner evaluations as outcome variables (aggressive, similar, trustworthy, moral, smart, selfish, good). Condition had a highly significant effect on all outcome variables (all univariate p's $< .001$). Planned contrasts comparing each of the two treatment conditions (LAG, HAG) to the control condition (CON) revealed significant effects for all variables. Table 1 shows the results of each contrast.

Table 1 Manipulation checks: Means, standard deviations, and contrasts

	M(SD)			Contrasts			
	LAG (N=41)	CON (N=59)	HAG (N=40)	LAG-CON	p	CON-HAG	p
Social Closeness	3.59(2.07)	3.24(1.94)	2.10(1.24)	0.35		1.14	<.01
Similarity	4.49(1.63)	4.15(1.30)	2.43(1.28)	0.34		1.72	<.001
Goodness	5.22(1.41)	4.54(1.12)	3.13(1.04)	0.68	<.01	1.41	<.001
Trust	5.39(1.28)	4.10(1.08)	2.70(1.24)	1.29	<.001	2.69	<.001
Morality	5.90(1.02)	4.20(1.20)	2.60(1.28)	1.70	<.001	2.60	<.001
Intelligence	5.05(1.20)	4.56(1.25)	3.88(0.85)	0.49	<.05	0.68	<.001
Aggression	2.02(1.26)	3.73(0.98)	6.05(1.30)	-1.71	<.001	-2.32	<.001
Selfishness	2.27(1.14)	3.80(1.20)	5.38(1.19)	-1.53	<.001	-1.58	<.001

Partner aggression also had an effect on social closeness, as measured by the IOS scale ($F(2,137) = 7.57$, $p = .001$, $\eta^2 = 10\%$). As shown in Table 1, Contrasts on the CON conditions showed that participants in the HAG condition were less cooperative than participants in the CON condition. Participants in the LAG condition were not significantly different from the CON condition.

Chapter 4

GENERAL DISCUSSION

Study 2 provided support only for Hypothesis 1, which was also supported in Study 1: the higher one's trait-aggression, the less cooperative is his/her SVO. This may be partially explained by the fact that the Study 2 sample was drawn from the participants in Study 1, but it is also important to note that Study 2 employed a different measure of SVO and was conducted approximately 2 months after the completion of Study 1. While study 2 does not provide a unique sample, it does show that the relationship between aggression and SVO is reliable across different measures and over time. The relationship is also relatively small in both studies, implying that there may be some moderating factors. Again, it should be noted that the difference in effect size relevant to H1 could be taken to mean that the power of SVO research could be increased by using continuous as opposed to categorical measures of this construct.

The second and third hypotheses were not supported, suggesting that individuals did not take partner aggression into account when making allocation decisions. One possibility is that the power necessary to test this effect was insufficient. Power analyses demonstrate that a sample 2-3 times the size of the one used in Study 2 would provide a test with adequate power (80%). Another interesting possibility, suggested by Figure 2 is that there may be gender differences with regards

to how partner aggression affects cooperation. At present, there is very limited statistical support for this assertion, but it may provide grounds for future studies. Theoretically, these hypothesized gender differences may have a basis in evolution as part of mating competition.

Overall, the studies provide some support for a relationship between aggression and SVO, but very little is known about the dynamics of this relationship and how it may be affected by characteristics of the partner. The manipulation checks all suggest that the HAG and LAG partners were evaluated as was intended on a number of characteristics related to aggression, but this manipulation does not seem to have affected cooperation. Sex differences as moderators of aggression effects are suggested by results of Study 2, but the effects were small, non-significant, and should be subjected to further investigation before any conclusions can be drawn.

REFERENCES

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.

Axelrod, R. & Hamilton, W. D. (1981). The evolution of cooperation. *Science, 211,* 1390-1396.

Balliet, D., Parks, C., & Joireman, J. (2009). Social value orientation and cooperation in social dilemmas: A meta-analysis. *Group Processes and Intergroup Relations, 12,* 533-547. DOI: 10.1177/1368430209105040.

Berscheid, E., Snyder, M., & Omato, A. M. (1989). The Relationship Closeness Inventory: Assessing the closeness of interpersonal relationships. *Journal of Personality and Social Psychology, 57,* 792-807.

Brewer, M. B. (1979). In-group bias in the minimal intergroup situation: A cognitive-motivational analysis. *Psychological Bulletin, 86(2),* 307-324. doi: 10.1037/0033-2909.86.2.307

Cornelissen, G., Dewitte, S., & Warlop, L. (2011). Are social value orientations expressed automatically? Decision making in the dictator game. *Personality and Social Psychology Bulletin, 37,* 1080-1090. Doi: 10.1177/0146167211405996.

Costa, P. T. & McCrae, R. R. (1992). *NEO Personality Inventory (NEO-PI-R).* Odessa, FL: Psychological Assessment Resources.

Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology, 31,* 169-193.

Festinger, L. (1954). Motivations leading to social behavior. (pp. 191-219) University of Nebraska Press, Lincoln, NE. Retrieved from http://search.proquest.com/docview/615273131?accountid=10457

Fischer, I. (2009). Friend or foe: Subjective expected relative similarity as a determinant of cooperation. *Journal of Experimental Psychology, 138,* 341-350. DOI: 10.1037/a0016073

Fischer, I. (2012). Similarity or reciprocity? On the determinants of cooperation in similarity-sensitive games. *Psychological Inquiry, 23,* 48-54. DOI: 10.1080/1047840X.2012.658004

Joireman, J. & Kuhlman, D. M. (2004). The Zuckerman-Kuhlman personality questionnaire: Origin, development, and validity of a measure to assess an alternative five factor model of personality (pp. 49-60). In R. M. Stelmack (Ed.), *On the psychobiology of personality: Essays in honor of Marvin Zuckerman*. Oxford: Elsevier

Kerr, N. L. (1983). Motivation losses in small groups: A social dilemma analysis. *Journal of Personality and Social Psychology, 45,* 819-828. doi: 10.1037/0022-3514.45.4.819.

Karagonlar, G. & Kuhlman, D. M. (2013). The role of social value orientation in response to an unfair offer in the ultimatum game. *Organizational Behavior and Human Decision Processes, 120,* 228-239. DOI: 10.1016/j.obhdp.2012.07.006.

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

Kuhlman, D. M. , Camac, C. R., & Cunha, D. A. (1986). Individual differences in social orientation. In H. Wilke, D. Messick, & C. Rutte (Eds.), *Experimental Social Dilemmas* (pp. 151-176). New York: Verlag.

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

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.

MacCrimmon, K. R., & Messick, D. M. (1976). A framework for social motives. *Behavioral Science, 21,* 86-100.

Martin, N. G., Eaves, L. J., Heath, A. C., Jardine, R., Feingold, L. M., & Eysenck, H. J. (1986). Transmission of social attitudes. *Proceedings of the National Academy of Sciences, USA, 83,* 4364-4368.

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

Messick, D. M., & Thorngate, W. B. (1967). Relative gain maximization in experimental games. *Journal of Experimental Social Psychology, 3*, 85-101.

Murphy, R. O., Ackermann, K. A., & Handgraaf, M. J. J. (2011). Measuring social value orientation. *Judgment and Decision Making, 6,* 771-781.

Pruitt, D. G., & Kimmell, M. J. (1977). Twenty years of experimental gaming: Critique, synthesis, and suggestions for the future. *Annual Review of Psychology, 28,* 363-392.

Stivers, A. (2009). Happy or sad: When people face the threat of social exclusion. Unpublished Honors thesis, Michigan State University.

Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of Personality and Social Psychology, 81(6),* 1058-1069. doi:10.1037/0022-3514.81.6.1058

Van Lange, P. A. M., Balliet, D., Parks, C. D., & Van Vugt, M. (2013). *Social dilemmas: Understanding human cooperation.* New York, New York: Oxford University Press.

Van Lange, P.A.M., & Kuhlman, D. M. (1994). Social value orientations and impressions of partneRs 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., Otten, W., De Bruin, E.M.N., & Joireman, J. A. (1997). Development of prosicial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology, 73,* 733-746.

Waller, N. G., Kojetin, B. A., Bouchard, T. J., Jr., Lykken, D. T., & Tellegen, A. (1990). Genetic and environmental influences on religious interests, attitudes, and values: A study of twins reared apart and together. Psychological Science, 1, 138-142.

Wang, Y., Roberts, K., Yuan, B., Zhang, W., & Shen, D. (2013). Psychophysiological correlates of interpersonal cooperation and aggression. *Biological Psychology, 93,* 386-391. Doi: 10.1016/j.biopsycho.2013.04.008.

Yamagishi, T., & Yamagishi, M. (1994). Trust and commitment in the United States and Japan. *Motivation and Emotion, 18,* 129-166.

Zuckerman, M. (2002). Zuckerman-Kuhlman Personality Questionnaire (ZKPQ). In B. De Raad & M. Perugini (Eds.), *Big Five Assessment,* 377-396.

Zuckerman, M., Kuhlman, D. M., & Camac, C. (1988). What lies beyond E and N? Factor analyses of scales believed to measure basic dimensions of personality. *Journal of Personality and Social Psychology, 54,* 96-107.

Zuckerman, M., Kuhlman, D. M., Joireman, J., Teta, P. & Kraft, M. (1993). A comparison of three structural models for personality: The Big Three, the Big Five, and the Alternative Five. *Journal of Personality and Social Psychology, 4,* 757-768.

Zuckerman, M., Kuhlman, D. M., Thornquist, M., & Kiers, H. (1991). Five (or three) robust questionnaire scale factors of personality without culture. *Personality and Individual Differences, 12,* 929-941.

APPENDIX A

ZKPQ AGGRESSION SCALE

(Zuckerman, M. (2002))

(High aggression responses indicated in bold)

The other person you have been randomly assigned to work with has previously completed a Personality Characteristics Questionnaire. They were asked to respond "True" or "False" to each of the following items. Their responses are shown in bold next to each item:

1) I enjoy seeing someone I don't care for humiliated before other people. **TRUE**
2) When I get mad, I say ugly things. **TRUE**
3) It's natural for me to curse when I am mad. **TRUE**
4) I almost never litter in the streets. **FALSE**
5) I almost never feel like I would like to hit someone. **FALSE**
6) If someone offends me, I just try not to think about it. **FALSE**
7) In many stores you just cannot get served unless you push yourself in front of other people. **TRUE**
8) If people annoy me, I do not hesitate to tell them so. **TRUE**
9) When I am angry with people I do not try to hide it from them. **TRUE**
10) I generally do not use strong curse words even when I am angry. **FALSE**

11) I can easily forgive people who have insulted me or hurt my feelings. **FALSE**
12) When people disagree with me I cannot help getting into an argument with them. **TRUE**
13) I have a very strong temper. **TRUE**
14) I can't help being a little rude to people I do not like. **TRUE**
15) I am always patient with other's even when they are irritating. **FALSE**
16) I often quarrel with other's. **TRUE**
17) When people shout at me, I shout back. **TRUE**

APPENDIX B

THE RING MEASURE OF SOCIAL VALUE ORIENTATION

(Karagonlar & Kuhlman, 2013; Liebrand, 1984)

This decision task is one in which you have been randomly paired with another person, whom we refer to simply as the "Other".

You will never knowingly meet or communicate with the Other, nor will he/she ever knowingly meet or communicate with you.

In this decision task, both you and the Other will choose between two options, labeled A and B.

Your own choices will produce points for yourself and the Other. Similarly, the Other's choices 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 this decision task is displayed below.

	A	B
You Get	400	500
Other Gets	100	300

In this example, if you choose A you would receive 400 points and the Other would receive 100
points.If you chose B, you would receive 500 points and the Other 300.

At the same time you are making your choices, the Other is also choosing between A and B. Look at the decision problem from his/her point of view.

	A	B
You Get	400	500
Other Gets	100	300

If he/she chooses A, he/she receives 400 and you receive 100. If he/she chooses B, he/she receives 500 and you receive 300.

So, the TOTAL number of points that you receive and that the Other receives is determined by your own choice in combination with that of the Other.

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 feels about his/her points in the same way; the more of them he/she accumulates, the better for him/her.

For each of the 12 decision problems please indicate which choice (A or B) YOU think is best for whatever reason.

We fully expect different people to have different opinions as to which is the best choice, and we're interested in knowing what you think.

Please click the >> button below to begin the decision task.

1. Please click the option you consider to be the best choice.

A	B
You Get 50 Other Gets -86	You Get 25 Other Gets -96

2. Please click the option you consider to be the best choice.

A	B
You Get 86 Other Gets 50	You Get 96 Other Gets 25

3. Please click the option you consider to be the best choice.

A	B
You Get 0 Other Gets -100	You Get 25 Other Gets -96

4. Please click the option you consider to be the best choice.

A	B
You Get 50 Other Gets 86	You Get 70 Other Gets 70

5. Please click the option you consider to be the best choice.

A	B
You Get 70 Other Gets -70	You Get 86 Other Gets -50

6. Please click the option you consider to be the best choice.

A	B
You Get 50 Other Gets 86	You Get 25 Other Gets 96

7. Please click the option you consider to be the best choice.

A	B
You Get 70 Other Gets 70	You Get 86 Other Gets 50

8. Please click the option you consider to be the best choice.

A	B
You Get 100 Other Gets 0	You Get 96 Other Gets -25

9. Please click the option you consider to be the best choice.

A	B
You Get 50 Other Gets -86	You Get 70 Other Gets -70

10. Please click the option you consider to be the best choice.

A	B
You Get 0 Other Gets 100	You Get 25 Other Gets 96

11. Please click the option you consider to be the best choice.

A	B
You Get 96 Other Gets -25	You Get 86 Other Gets -50

12. Please click the option you consider to be the best choice.

A	B
You Get 100 Other Gets 0	You Get 96 Other Gets 25

APPENDIX C

THE SLIDER MEASURE OF SOCIAL VALUE ORIENTATION

(Murphy, Ackermann, & Handgraaf, 2011)

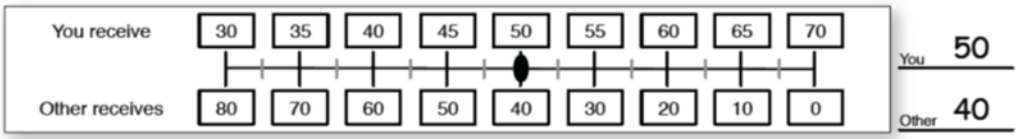
Instructions

In this task you have been randomly paired with another person, whom we will refer to as the **other**. This other person is someone you do not know and will remain mutually anonymous. All of your choices are completely confidential. You will be making a series of decisions about allocating resources between you and this other person. For each of the following questions, please indicate the distribution you prefer most by **marking the respective position along the midline**. You can only make one mark for each question.

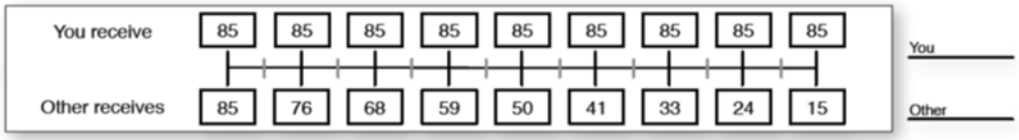
Your decisions will yield money for both yourself and the other person. In the example below, a person has chosen to distribute money so that he/she receives 50 dollars, while the anonymous other person receives 40 dollars.

There are no right or wrong answers, this is all about personal preferences. After you have made your decision, **write the resulting distribution of money on the spaces on the right**. As you can see, your choices will influence both the amount of money you receive as well as the amount of money the other receives.

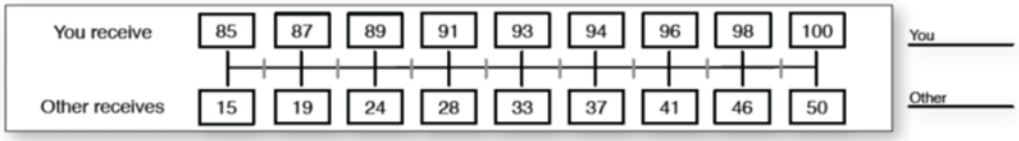
Example:



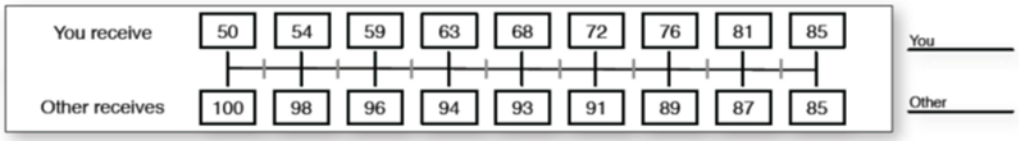
1



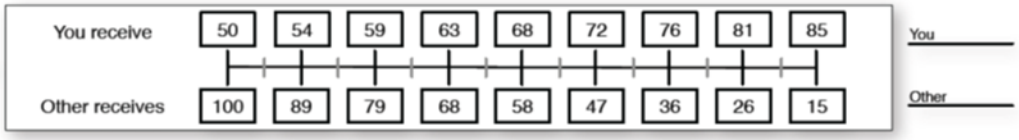
2



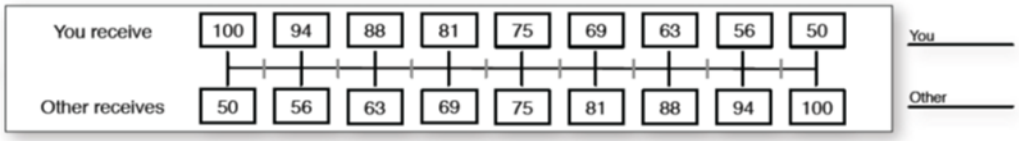
3



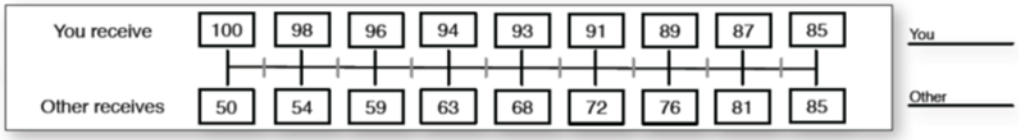
4

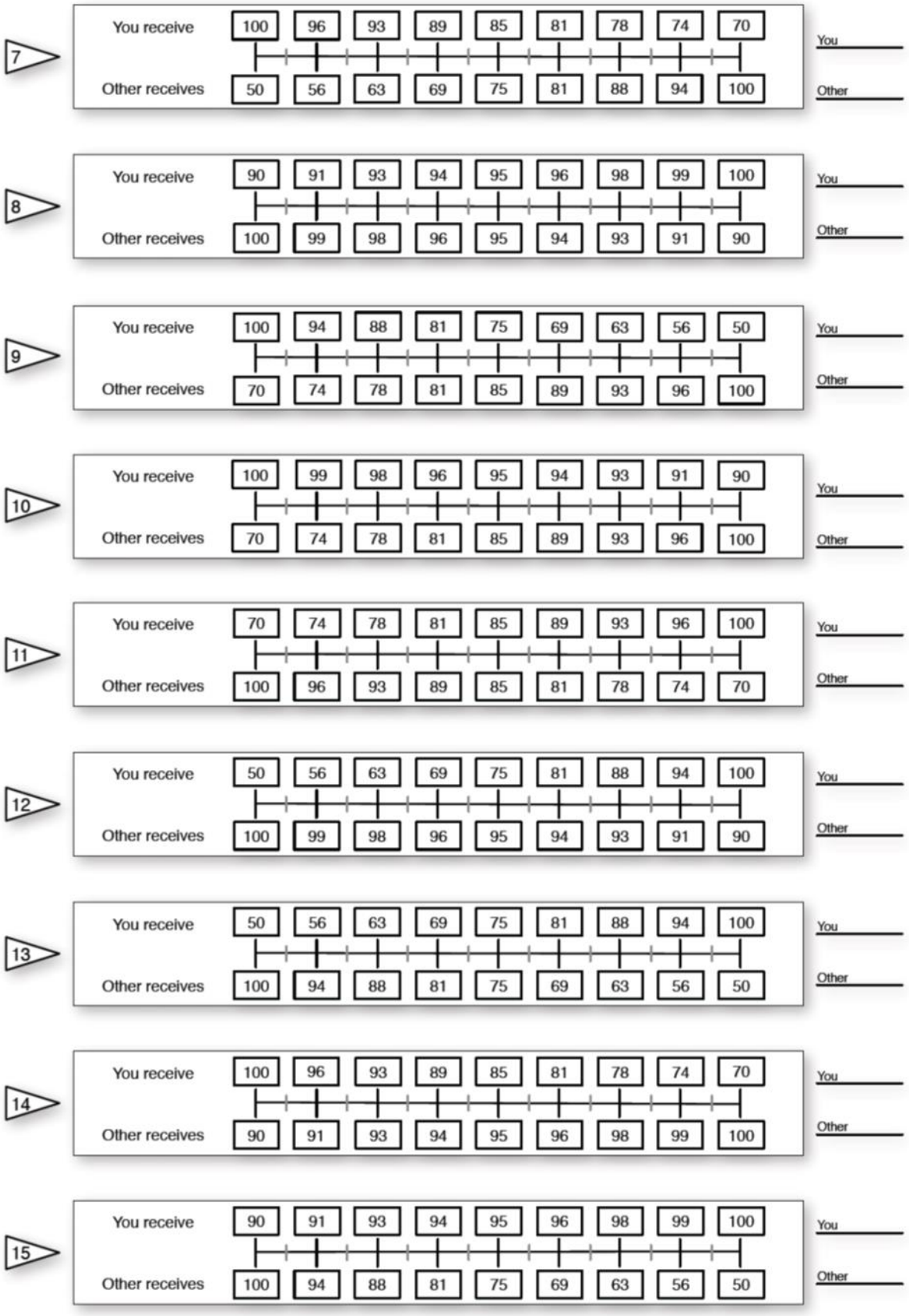


5



6




7
You receive
100 96 93 89 85 81 78 74 70
Other receives
50 56 63 69 75 81 88 94 100
You
Other
8
You receive
90 91 93 94 95 96 98 99 100
Other receives
100 99 98 96 95 94 93 91 90
You
Other
9
You receive
100 94 88 81 75 69 63 56 50
Other receives
70 74 78 81 85 89 93 96 100
You
Other
10
You receive
100 99 98 96 95 94 93 91 90
Other receives
70 74 78 81 85 89 93 96 100
You
Other
11
You receive
70 74 78 81 85 89 93 96 100
Other receives
100 96 93 89 85 81 78 74 70
You
Other
12
You receive
50 56 63 69 75 81 88 94 100
Other receives
100 99 98 96 95 94 93 91 90
You
Other
13
You receive
50 56 63 69 75 81 88 94 100
Other receives
100 94 88 81 75 69 63 56 50
You
Other
14
You receive
100 96 93 89 85 81 78 74 70
Other receives
90 91 93 94 95 96 98 99 100
You
Other
15
You receive
90 91 93 94 95 96 98 99 100
Other receives
100 94 88 81 75 69 63 56 50
You
Other

APPENDIX D

MANIPULATION CHECK QUESTIONS

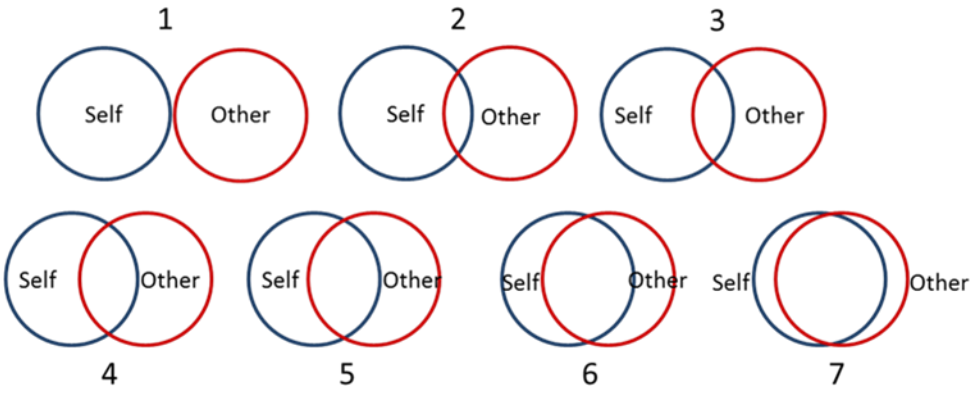
(Response scales ranged from 1 (Not at all) to 7 (Extremely)

1. In general, what do you think of the Other person?
2. How similar do you think you and the Other person are?
3. How trustworthy do you think the other person is?
4. How moral do you think the Other person is?
5. How aggressive do you think the other person is?
6. How smart do you think the Other person is?
7. How selfish do you think the Other person is?

APPENDIX E

INCLUSION OF OTHER IN SELF SCALE

(Aron, Aron, & Smollan, 1992)



APPENDIX F

IRB APPROVAL LETTER

RESEARCH OFFICE

210 Hullihen Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: April 20, 2011

TO: Adam Stivers, BA
FROM: University of Delaware IRB

STUDY TITLE: [236468-1] Social Distance and Social Motives

SUBMISSION TYPE: New Project

ACTION: APPROVED (R. Simons)
APPROVAL DATE: April 20, 2011
EXPIRATION DATE: April 19, 2012
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.