2012-07-03

Does Gratitude Promote Reciprocity in Response to All Benefits, or Just Those Rendered by Novel Relationship Partners? Testing the Role of Gratitude in the Establishment of Reciprocal Relationships

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By

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A DISSERTATION

Submitted to the Faculty
of the University of Miami
in partial fulfillment of the requirements for
the degree of Doctor of Philosophy

Coral Gables, Florida

August 2012

UNIVERSITY OF MIAMI

A dissertation submitted in partial fulfillment of
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(August 2012)

Abstract of a dissertation at the University of Miami.

Dissertation supervised by Professor Michael McCullough.
No. of pages in text. (87)

This dissertation was designed to examine whether people feel more gratitude in response to benefits rendered by strangers and acquaintances than in response to benefits provided by established reciprocal relationship partners and genetic relatives, and whether the gratitude experienced in response to benefits provided by those novel non-kin benefactors is more likely to lead to motivation to reciprocate than is the gratitude elicited by benefits rendered by genetic relatives and established reciprocal altruism partners. It was hypothesized that gratitude would be more salient when benefits are rendered by strangers and acquaintances than by well-known individuals in already-established reciprocal relationships or in kin relationships. Using self-report questionnaires from 128 University of Miami students, this study revealed that benefit recipients reported stronger urges to reciprocate, engaged in more reciprocal prosocial behavior, and were more likely to respond to the feeling of gratitude with prosocial reciprocation when benefitted by friends and siblings than when benefited by acquaintances. Additionally, post-benefit contact significantly predicted reciprocal action, and post-benefit contact mediated the effects of relationship type on recipients' reciprocal actions and urges to reciprocate. Although findings did not support the original hypotheses, these findings indicate that there are other factors correlated with relationship

type that influence an individual's likelihood of feeling grateful and reciprocating. To the extent that these factors (e.g., a high likelihood of future post-benefit interaction) are present, they might prevent mechanisms designed for reciprocal altruism from creating internal motivations to engage in reciprocal prosocial behavior.

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Chapter 1: Introduction

Direct reciprocity, a behavioral process in which cooperation emerges in repeated encounters between the same two individuals according to the principle "I'll help you now and you help me later," is pervasive among humans. Reciprocity and cooperation are observable throughout the animal kingdom, and species that use this behavioral strategy are thought to enjoy many benefits. Humans are particularly remarkable for our abilities to generate reciprocity between non-kin (Trivers, 1971). Some scholars even posit that our ancestors' abilities to work together with individuals other than genetic relatives (viz., parents, siblings, and offspring) for food, protection, and childcare may have helped us become Earth's most dominant vertebrate (Pennisi, 2005).

Although reciprocal relationships appear to have served an adaptive purpose in human evolution, to make use of cooperation an individual must first overcome the worry that the resources invested to form and maintain a new relationship might not be repaid (Bartlett & DeSteno, 2006). The anxiety that prosocial behaviors might not be reciprocated may explain findings that people tend to accept fewer favor requests from strangers than from close friends and kin (Han, Li, & Hwang, 2005; Fujisawa, Kutsukake, & Hasegawa, 2008). As overcoming this worry seems to be an essential step in forming new mutually beneficial relationships, it is possible that mechanisms have evolved to help an individual foster and benefit from relationships with others. Researchers have pointed to gratitude as potentially evolving to serve this purpose (McCullough, Kimeldorf, & Cohen, 2008).

Researchers conceptualize gratitude in a variety of different and often overlapping ways. Generally, gratitude is thought be a positive prosocial emotion that can foster

mutually beneficial relationships. Guralnik defines gratitude as "a feeling of thankful appreciation for favors received" (1971, p. 327). Gratitude is also thought be an "empathic emotion," as it is experienced when people empathize with their benefactors' intentions and the costs incurred while helping (McCullough, Kilpatrick, Emmons, & Larson, 2001). Other emotion theorists view gratitude as the combination of admiration and joy, whereby admiration arises from approval of the benefactor's action and joy is felt when the action is thought to be personally favorable (Ortony, Clore, & Collins, 1988).

Distinguishing Gratitude from Similar Affective States

Recent studies have demonstrated that gratitude is a prosocial affective state that is distinct from both happiness and indebtedness, even though some writers have tended to ignore their differences. Whereas positive moods have been shown to increase prosocial responding, this effect does not hold when the prosocial act is costly to the helper, perhaps because people in positive (but not necessarily grateful) moods do not engage in costly prosocial responding because they do not want to spoil their good moods (Isen & Simmond 1978). In contrast, people who are experiencing gratitude are willing to help even when the helping is costly. Bartlett and DeSteno (2006) found that participants in an experimentally induced state of gratitude helped a benefactor more than participants who were in an experimentally induced general positive affective state. Furthermore, a subsequent study demonstrated that participants induced to feel gratitude complied more with a stranger's request to participate in a tedious and cognitively taxing survey than participants not involved in a mood induction. These findings, demonstrating

gratitude's ability to foster costly prosocial responding, notably distinguish it from a general positive affective state.

Distinguishing gratitude-driven prosocial responding from obligation-driven prosocial responding further demonstrates gratitude's unique contribution to relationship formation and maintenance. Though scholars sometimes use obligation terms and gratitude terms interchangeably, the two concepts have substantial differences. Obligation has been generally experienced as negative and uncomfortable, while gratitude is a positive affective state associated with contentment and happiness (McCullough, Kilpatrick, Emmons, & Larson, 2001). Equity theorists posit that individuals who feel indebted increase prosocial responding out of a desire to maintain an equitable relationship (Berscheid & Walster, 1973). Although equity theory is consistent with the notion that obligation explains the positive effects of favors on compliance with benefactor requests, research demonstrates that increased feelings of obligation do not lead to increased compliance. In contrast, gratitude has been shown to have a positive effect on compliance, even when controlling for the effects of obligation (Goei & Boster, 2005). Thus, neither happiness nor indebtedness foster costly prosocial responding, but gratitude does.

The Effects of Gratitude and Its Possible Evolution

McCullough and colleagues (2001) posited that gratitude is a "moral emotion," in that it stimulates behavior motivated out of a concern for others. They specifically proposed that gratitude has three specific effects in the realm of interpersonal relations: a "moral barometer" effect, a "moral reinforcer" effect and a "moral motive" effect.

Understanding these three social effects of gratitude might help us to better understand the evolutionary forces that gave rise to its evolution.

Gratitude as Moral Barometer

Gratitude is thought to act as a moral barometer in that it results from the processing of benefit-related information. Just as all socially based emotions can occur in response to environmental information relevant to one's relationships, McCullough and colleagues (2001) proposed that gratitude is experienced to the extent that a recipient interprets a benefit to be (a) costly to the benefactor, (b) valuable to the recipient, (c) intentional, and (d) given without obligation. In this way, gratitude can be thought of as serving as a "benefit-detector," helping people realize when someone has benefited them. Recent studies, such as those conducted by Tsang (2007), give initial support to the benefit-detector hypothesis. Tsang found that participants who received more costly raffle-tickets were more grateful than those who received less expensive raffle tickets.

Gratitude as Moral Reinforcer

McCullough and colleagues (2001) also described gratitude as a moral reinforcer, meaning that expressions of gratitude increase the chance of incurring subsequent benefits from one's benefactor. According to their conceptualization, expressions of gratitude make a benefactor's experience of giving more positive and, thus, those expressions of gratitude reinforce the prosocial behavior. As mentioned above, writing "thank you" on a restaurant bill significantly increases gratuity (Rind & Bordia, 1995). Several other studies show that benefactors who have been thanked are subsequently more giving (McCullough et al., 2001; Wood et al., 2008). McCullough and colleagues (2008) suggested that expressions of gratitude increase the likelihood of receiving more

benefits from their benefactor because those who express gratitude "seem like safe targets for future investments."

Gratitude as Moral Motive

The experience of gratitude is not only thought to help in detecting and reinforcing benefits, but also in motivating beneficiaries to behave prosocially themselves. In other words, gratitude can be conceptualized as a "moral motive." As a result, McCullough and colleagues (2001) posited that beneficiaries who experience gratitude will be more likely to act prosocially, and less likely to act destructively, toward their benefactors. They also hypothesized that those who feel gratitude are more likely to act prosocially toward a third party. Consistent with this proposition, it has been found that those with higher levels of self-rated and peer-rated dispositional gratitude rate themselves (and are rated by others) as having a stronger disposition to behave prosocially (McCullough, Emmons, and Tsang, 2002). Other studies have revealed that participants made to feel grateful toward a research confederate were more willing to help the confederate than participants in the control group. Participants made to feel grateful were also more likely to help unrelated strangers (Bartlett & DeSteno, 2006).

Gratitude as a Facilitator of Direct Reciprocity among Non-Kin

Given gratitude's apparent efficacy as a moral barometer, a moral reinforcer, and a moral motive, it seems conceivable that gratitude evolved to promote cooperation or reciprocal altruism—particularly among non-kin. Gratitude seems particularly well suited to fostering mutually beneficial bonds with strangers and acquaintances rather than in the context of kin relations or well-developed friendships, as might be expected on the basis

of Trivers's (1971) account of reciprocal altruism (McCullough, Kimeldorf, & Cohen, 2008).

In support of this idea, Dunn and Schweitzer (2005) found that gratitude influenced an unrelated trust judgment significantly more than emotions characterized by the perception of personal control, such as pride or guilt. Gratitude, insofar as it can increase an individual's level of trust, may therefore directly aid people in overcoming the aforementioned worries about wasting their energy and resources on relationship partners whose likelihood of reciprocating is not yet well established. As these worries may thwart the formation of a potentially beneficial relationship, gratitude's ability to help one overcome this obstacle may have contributed to its evolutionary success. Importantly for this conceptualization of gratitude's role in the formation of reciprocal relationships, gratitude's effects on trust are strongest when the person to be trusted is not already well known to the person experiencing the grateful emotion (Dunn & Schweitzer, 2005).

Gratitude not only fosters relationship formation indirectly via trust: It has also been found to foster relationships by increasing prosocial emotions and perceptions. For example, Algoe, Haidt, and Gable (2008) studied college sororities during a week of gift-giving from older members to newly accepted members, and found that naturally occurring gratitude in college sororities predicted future positive relationship outcomes. They also found that gratitude was predicted by the new member's perception of how thoughtful the older member was in providing gifts. More thoughtful and personally appropriate gifts were found to make a new member feel closer and more connected to the older member, possibly explaining why more thoughtful gifts led to increased

gratitude and closer relationships. Furthermore, the finding that greater perceived effort was predictive of increased gratitude may suggest that the emotion of gratitude was crafted by natural selection because of its ability to selectively increase feelings of trust toward people who are not currently well known as a way of promoting further efforts to develop reciprocal relationships. In support of this general notion, Wood and colleagues (2008) also found that gratitude was associated with higher levels of perceived social support.

Evolutionary theory provides good theoretical reasons for supposing that gratitude evolved specifically to facilitate reciprocal altruism among non-kin. The most important of these reasons is that sharing with one's kin does not need a reciprocity-based mechanism to insure the exchange of benefits: As people share up to 50% of their genes with their kin (except in the rare case of monozygotic twins, in which siblings share 100% of their genes), it is in people's genetic self-interest, by virtue of inclusive fitness (Hamilton, 1964), to ensure their kin's survival, irrespective of whether those relatives are likely to pay them back in the future.

In support of this theoretical expectation that gratitude is somewhat superfluous to kin altruism, a preliminary study revealed that people may experience significantly less gratitude toward benefactors who are genetic relatives than toward friends, acquaintances, or strangers who provide the same benefit. Bar-Tal, Bar-Zohar, Greenberg, and Hermon (1977) presented 100 people with hypothetical scenarios in which help is rendered to them by a benefactor who was the participant's parent, a sibling, a close friend, an acquaintance, or a stranger. Participants reported anticipating the most gratitude if the favor had been rendered by rendered by a non-relative than by a

relative, which supports the hypothesis that gratitude is more readily experienced toward acquaintances and strangers who have provided benefits than toward genetic relatives who have provided benefits.

If gratitude is an emotion that really was naturally selected on the basis of its ability to (a) alert one to individuals in one's environment who can provide novel and important benefits, and (b) motivate efforts to reciprocate those benefits, then gratitude should be more salient when benefits are rendered by strangers and acquaintances than by well-known individuals in already-established reciprocal relationships or in kin relationships. Furthermore, gratitude's ability to promote reciprocity should be more potent in novel relationships than in well-established ones or in kin relationships. This is because gratitude is superfluous as a mechanism for promoting relationship among kin, since there is already a strong adaptive incentive for humans to have developed mechanisms to benefit their kin irrespective of reciprocity (Hamilton, 1964).

Although Bar-Tal and colleagues' (1977) study provides interesting and promising preliminary evidence for the hypothesis that gratitude evolved to promote reciprocal altruism among non-kin, their study had several limitations. First, it was a scenario study in which people were asked to imagine receiving a benefit and then to describe the emotional reaction they believed they would have in such a situation. Although, scenario studies can find out about a hypothetical situation that has not actually occurred to all participants, it has been found that participant information on hypothetical events often lacks reliability (Nisbett & Wilson, 1977). Also, Bar-Tal and colleagues examined participants' (hypothetical) responses to a single benefit-giving scenario: One in which the protagonist is in need of a ride to the airport, which is then provided by one

of the five types of relationship partners. It is not known whether specific aspects of this scenario were responsible for the effects that Bar-Tal et al. discovered, or whether their findings would have generalized to a larger universe of possible benefits.

Third, Bar-Tal and colleagues only used two 7-point bipolar rating scales and two open-ended questions to come to their conclusions. The only question used to directly measure participants' gratitude toward their benefactor asked, "How much gratitude do you feel toward the called person?" (p. 296). The only other quantitative question asked, "To what extent do you feel that the person you called was under some obligation to help?" A wider set of questions asked about people's emotional reactions to benefits could allow gratitude's distinctive features to be distinguished from features that it might share with emotions such as happiness or obligation/indebtedness. Moreover, it would be most useful also to examine the presumed action tendencies that gratitude presumably stimulates, such as the motivation to render reciprocal benefits to the benefactor or to deepen the relationship with the benefactor, which should reliably follow from gratitude if this emotion really did evolve to support reciprocal altruism (McCullough et al., 2008; Trivers, 1971).

The Goals of this Dissertation

This dissertation was designed to examine whether people feel more gratitude in response to benefits rendered by strangers and acquaintances than in response to benefits provided by established reciprocal relationship partners and genetic relatives, and whether the gratitude experienced in response to benefits provided by novel non-kin benefactors is more likely to lead to motivation to reciprocate and reciprocal effort than is the gratitude elicited by benefits rendered by genetic relatives and established reciprocal

altruism partners. In statistical terms, this dissertation investigated relationship type as a moderator of gratitude in response to benefits, and as a moderator of its effects on beneficiaries' behavior. This study more elaborately and specifically asked questions concerning the subjects' level of gratitude in response to the receipt of benefits, and the interpersonal behaviors toward their benefactors (and perhaps others) that participants enacted in response to the benefits that they received. Also, this study examined changes in benefactors' feelings toward their benefactors. I also ascertained participants' perceptions of the costs of the benefits to the benefactors and the value of the benefits to the beneficiaries to control for possible differences in these variables that may confound efforts to find differences across relationship type (McCullough et al., 2001).

Another important feature of the proposed study is that it involved the recollection of real-life events from participants' lives in which various types of relationship partners provided benefits for them (and in which they provided benefits to others). By studying real-life instances of benefit delivery, I was more able to examine the relational effects of gratitude with more veridicality than could be established using scenario methods (Nisbett & Wilson, 1971; cf. Bar-Tal et al., 1971).

A final important feature of this study is that I examined beneficiaries' self-reports of their affective and social responses to benefits from benefactors in their past, as well as benefactors' *reports* of their beneficiaries' responses to the benefits that they provided them. I did this by asking participants to recall three events from their past in which a sibling, a good friend, and an acquaintance provided a benefit to them. Additionally, I asked each participant to recall three events from his or her past in which he or she provided a benefit to a sibling, a good friend, and an acquaintance.

I hypothesized that participants would report that beneficiaries experience more gratitude, and more reciprocal behaviors (e.g., motivation to repay, motivation to be near the benefactor or deepen the relationship with the benefactor, elaborate verbal acknowledgements of benefits and intention to repay, etc.) when the benefactors were strangers or acquaintances than when they were siblings, or well-established friends (i.e., ongoing reciprocal relationship partners). In addition, I hypothesized that the link between gratitude and reciprocal responding would be stronger in relationships with acquaintances than in relationships with siblings or close friends. In testing these hypotheses, I measured and controlled for a variety of third variables that could be alternate explanations for the link between relationship type and gratitude, including: (a) perceived gift cost, (b) perceived gift value and (c) participants' reports of relationship closeness/commitment prior to the benefit. Finally, I looked for relational differences in action tendencies related to obligation and indebtedness.

Chapter 2: Methods

Participants

I enrolled 128 undergraduates from the University of Miami's courses in introductory psychology. These students were enrolled through an online site that all students in introductory psychology use to fulfill their experiment participation requirement. Upon completing the study, each participant received one hour of credit toward their Introductory Psychology research participation course requirement.

For participants asked about times when they had been benefited, the mean age of the study participants was 19.6 (SD = 1.8), the modal gender was female (59%), and the modal racial identification was White (75%). Also, 8% identified themselves as racially Asian, 5% of participants identified themselves as racially African-American, and 18% of participants identified themselves as ethnically Hispanic.

For participants asked about times when they had benefited another person, the mean age of the study participants was 19.5 (SD = 1.7), the modal gender was female (56%), and the modal racial identification was White (75%). Also, 9% of participants identified themselves as racially African American, 7% identified themselves as racially Asian, and 22% of participants identified themselves as ethnically Hispanic.

Measures: Participant as Recipient

General Information Questionnaire. This questionnaire was used to gather information about the person who helped the participant, such as age and gender. This questionnaire also gathered information about the extent to which the participant had contact with this person in the two months following the benefit (See Appendix A).

Closeness/Commitment scale – Participant as Recipient. Participants' subjective feelings of closeness with their benefactors prior to receiving the gift or favor was

measured with a 4-item scale (see Appendix B). This measure gauged participants' feelings of emotional closeness, commitment, and relationship importance (e.g. "On a scale from 1 to 7, please indicate how close you were to the person prior to him or her giving you the gift or doing the favor in question.") These items were completed on a 7-point Likert-type scale, with higher scores signifying higher levels of perceived closeness with and commitment to the benefactor prior to the benefit. One of these items is Aron and colleagues' (2002) Inclusion of Other in the Self Scale (IOS), a pictorial measure designed to gauge the extent to which the other is included in the self consisting of seven Venn diagrams with two circles (marked "self" and "other") with increasing degrees of overlap. These items have been used in previous studies and the four-item composite demonstrated high internal consistency reliability, $\alpha = .96$ (Cohen, 2008).

Communal Strength Scale: Participant as Recipient. To measure the extent to which participants felt motivated to respond to a communal partner's need prior to the benefit, I used the 10-item communal strength measure developed by Mills, Clark, Ford, and Johnson (2004). This 11-point Likert-type scale has response options ranging from "not at all" to "extremely" (See Appendix C). Examples of items include: "How far would you be willing to go to visit___?," "How high a priority for you is meeting the needs of____ ?," and "How easily could you accept not helping ____?" This scale has demonstrated adequate internal consistency, as well as discriminant and predictive validity in college student samples (Mills et al., 2004). To adapt the scale's instructions for the present study, participants were instructed to , "Keep in mind the specific person who did something good for you. Please answer the following questions regarding how you felt about this person before he or she gave you the gift or did the favor in question.

As you answer each question, fill in the person's initials in the blank. Circle one answer for each question on the scale from 0 = Not at all to 10 = Extremely before going on to the next question." These items were used in conjunction with the closeness/commitment items to gauge participants' perceptions of relationship closeness, commitment, and strength with their benefactor.

Benefit Cost and Value Scale – Participant as Recipient. I measured participants' perceptions of the costs of the benefit to the benefactor and the value of the benefit to the recipient with these 17 items (see Appendix D). Using an 11-point Likert-type scale (0 = *Not at all* and 10 = *Extremely*) participants were asked to, "please circle one answer for each question on the scale from 0 = Not at all to 10 = Extremely" in reference to "what you thought about the favor or gift right afterward."

Post-Benefit Gratitude Checklist: Participant as Recipient. The PGC is a 3-item checklist that measures participants' feelings of gratitude toward their benefactor immediately following the benefit (see Appendix E). Using a 7-point Likert-type scale (1 = *Completely disagree* and 7 = *Completely agree*) participants were asked to "please indicate the extent to which you experienced the following feelings right after the person gave you this gift or did this favor for you." This checklist includes several adjectives for measuring gratitude (e.g., "Grateful," "Thankful," "Appreciative"). After conducting some basic item analyses (e.g., item means, variances, intercorrelations, and internal consistency estimates of item aggregates) this questionnaire was used to generate a measure of grateful feelings.

Action Tendency Scale – Participant as Recipient. The Action Tendency Scale contains 46 items that are intended to measure how participants acted (or felt like acting)

toward their benefactors immediately following the benefit (see Appendix F). Using a 5-point Likert-type scale (1 = *Not at all* and 5 = *To a great extent*) participants were asked to "Please indicate (by circling a single number for each item) the extent to which you felt the urge to do the following things toward this person right after he/she gave you the gift or did the favor for you". Items were based on a list of action tendencies created by Watkins and Colleagues (2006) and McCullough's *Revised Transgression Appeasement and Reconciliation Questionnaire* (TARQ II).

Behavioral Responses to Benefit Scale – Participant as Recipient. This is 44-item scale that measures participants' behavioral response to their benefactor immediately following their receipt of the benefit (see Appendix G). Using a 5-point Likert-type scale (1 = *Not at all* and 5 = *Extremely*) participants were asked to, *"please indicate (by circling a single number for each item) the extent to which you did the following things toward this person right after he or she did this good thing for you."*

Many of these scales have not been used in previous studies, so before proceeding I conducted some basic item analyses (e.g., item means, variances, intercorrelations, and internal consistency estimates of item aggregates) to assist in deciding how to combine items into their associated summary scores.

Measures: Participant as Benefactor

General Information Questionnaire. This questionnaire was used to gather information about the person whom the participant helped, such as age and gender. This questionnaire also gathered information about the extent to which the participant had contact with this person in the two months following the benefit (See Appendix H).

Closeness/Commitment scale – Participant as Benefactor. Participants' subjective feelings of closeness with their beneficiaries prior to bestowing the gift or favor was measured with versions of the same scales that they used to indicate their feelings of closeness/commitment to their benefactors in the first part of the study (see Appendix I).

Communal Strength Scale: Participant as Benefactor. To measure the extent to which participants felt motivated to respond to a communal partner's need prior to the benefit, I used the 10-item communal strength measure used developed by Mills, Clark, Ford, and Johnson (2004). This 11-point Likert-type scale has response options ranging from "not at all" to "extremely" (See Appendix J). Examples of items include: "How far would you be willing to go to visit___?," "How high a priority for you is meeting the needs of____ ?," and "How easily could you accept not helping ____?" This scale has demonstrated adequate internal consistency, as well as discriminant and predictive validity in college student samples (Mills et al., 2004). To adapt the scale's instructions for the present study, participants were instructed to, "Keep in mind the specific person who you did the favor for. Please answer the following questions regarding how you felt about this person before he or she did the favor in question. As you answer each question, fill in the person's initials in the blank. Circle one answer for each question on the scale from 0 = Not at all to 10 = Extremely before going on to the next question." These items were used in conjunction with the closeness/commitment items to gauge participants' perceptions of relationship closeness, commitment, and strength with their recipient.

Benefit Cost and Value Scale – Participant as Benefactor. I measured participants' perceptions of the costs of the benefit to the benefactor and the value of the benefit to the recipient with 16-items (see Appendix K).

Post-Benefit Perceived Emotion Checklist (PPGC). The PPEC is a 3-item checklist that measured participants' perceptions of their recipients' feelings of gratitude toward the benefactor following the benefit (see Appendix L). Using a 7-point Likert-type scale (1 = *Completely disagree* and 7 = *Completely agree*) participants were asked to, "*please indicate the extent to which it seemed as if this person experienced the following feelings right after you gave him/her this gift or did this favor for him/her.*" This checklist includes several adjectives for measuring gratitude (e.g., "Grateful," "Thankful," "Appreciative"). After conducting some basic item analyses (e.g., item means, variances, intercorrelations, and internal consistency estimates of item aggregates) this questionnaire was used to generate a measure of grateful feelings toward the participant.

Behavioral Responses to Benefit Scale – Participant as Benefactor. This is 41-item scale that measured participants' perceptions of their recipients' behavior after participants gave those recipients a gift or provided a favor (See Appendix M). Using a 5-point Likert-type scale (1 = *Not at all* and 5 = *Extremely*) participants were asked to, "Please indicate (by circling a single number for each item) the extent to which this person did the following things toward you right after you did this good thing for him/her."

Current Feelings Questionnaire. These questions measured the extent to which the participants felt that the person who they benefitted responded appropriately. This was measured by asking, "How satisfied were you with the way this person responded to you helping him/her?" This questionnaire also measured the benefactor's likelihood of

helping this person in the future by asking, “How willing would you be to help this person in the future?” (See Appendix N).

Procedures

Participants were asked to complete a questionnaire about real-life events from their pasts. There were two different questionnaire packets, and participants were randomly assigned to complete one of these packets. The first questionnaire packet consisted of three parts: (a) a part in which they were asked to recall a time they were helped by a sibling, (b) a part in which they were asked to recall a time they were helped by a close friend, and (c) a part in which they were asked to recall a time they were helped by an acquaintance. Four participants without siblings were asked to write about a time when one of their genetic parents helped them. Participants were asked to fill out all of the aforementioned recipient questionnaires in reference to each of the three recalled benefactors. The presentation order of the three relationship types were counterbalanced. The second questionnaire packet also consisted of three parts: (a) a part in which they were asked to recall a time they helped their sibling, (b) a part in which they were asked to recall a time they helped a close friend, and (c) a part in which they were asked to recall a time they helped an acquaintance. Five participants without siblings were asked to write about a time when one of their genetic parents helped them. Participants were asked to fill out all of the aforementioned recipient questionnaires in reference to each of the three recalled benefactors. We collected participants until we had 50 in the sibling condition irrespectively of whether we oversample in other cells as a result.

At the end of each part, participants provided a written description of a help that they received (or gave), the circumstances in which it was received (or given), and the amount of time that has elapsed since that benefit-delivery event occurred. Participants then answered questions concerning details of the event and the person they were helped by (or helped). Then participants completed the measures of pre-benefit closeness/commitment and communal strength. Next, they completed the measures of perceived cost, and value. Finally, they completed the measures of beneficiaries' emotions (or perceived emotions), action tendencies, and post-benefit recipient behaviors.

Chapter 3: Results

Study 1: Participant as Recipient

Preliminary Analyses

The majority of study variables had no missing data. Due to a photocopying error in four questionnaire packets, data for participant gratitude, reciprocity, benefit cost, and benefit value are missing from 4 participants. Missing data were present for several study variables, but were not indicative of systematic response bias. Means, standard deviations, and internal consistency reliabilities for major study variables appear in Table 1. The correlations among major study variables appear in Tables 2 through 4. List of the items used in each variable appear in Tables 10 and 16.

Residual Analyses

After confirming that measures had acceptable levels of internal consistency, I examined several variables that may confound the relationship between gratitude and relationship type (namely, the perceived value of the benefit to the recipient and the perceived cost of the benefit to the benefactor). I did so by performing a one-way within-subjects Analysis of Variance (ANOVA) for each potential confounding variable, whereby the three scores for each subject (one for each relationship type) were compared to each other. Based on these analyses, I found that the effect of relationship type on perceive benefit cost was significant, $F(2,54) = 10.84$, $p = .001$. Also, the effect of relationship type on perceive benefit value was significant, $F(2,54) = 3.15$, $p = .040$ (See Table 5). Consequently, benefit cost and value were statistically controlled through an Analysis of Covariance (ANCOVA). This analysis entailed stacking the data of all three relationship types into one data set with 180 rows, regressing gratitude on benefit cost

and value, calculating a regression residual for each row, and then placing the resulting residuals back into their original position based on participant number and relationship type. Each residual is a measure of the difference between each actual score and the above regression's predicted score. Consequently, each residual represents gratitude once cost and value have been accounted for. The resulting residual scores were then used instead of the original scores to evaluate the main hypothesis. Similar residuals were computed for the urge to reciprocate and prosocial response variables. Therefore, when I examine differences in gratitude, expressed gratitude, urge to reciprocate, or prosocial action below, those differences by relationship type are statistically equated on perceived benefit cost and perceived benefit value.[1]

Effects of Relationship Type on Levels of Recipient Gratitude

A within-subjects analysis of variance (ANOVA) comparing recipient gratitude as a function of relationship types was conducted, while controlling for benefit cost and value in the aforementioned manner. In this analysis the effect of relationship type was not significant, $F(2,54) = 1.43$, $p = .243$. Thus, people experienced equal amounts of grateful emotion in response to benefits provide by all three types of relationship partners.

Effects of Relationship Type on Urge to Reciprocate

A within-subjects ANOVA comparing recipient urge to reciprocate as a function of relationship type, while controlling for cost and value, showed that the effect of relationship type was significant, $F(2,54) = 8.01$, $p = .001$. Benefit cost- and value-residualized measures of urge to reciprocate were then compared across the three conditions. Results of this analysis can be seen on Table 6. Post-hoc contrasts revealed

that each relationship type was significantly different from each other relationship type with respect to recipients' urge to reciprocate. Participants indicated a significantly higher urge to reciprocate toward friends (M = 3.94, SD = .80) than toward acquaintances (M = 3.29, SD = .95), $F(2,54) = 14.01$, $p < .01$. Participants also indicated a significantly higher urge to reciprocate toward friends over siblings (M = 3.83, SD = .88), $F(2,54)$ = 4.09, p = .048. Finally, participants indicated a significantly higher urge to reciprocate toward siblings than towards acquaintances, $F(2,54) = 4.53$, p = .038. Therefore, after controlling for differences in the cost and value of the benefits that friends, siblings, and acquaintances gave, participants felt stronger urges to reciprocate toward existing close relationship partners.

Effects of Relationship Type on Reciprocal Action

Based on results from a within-subjects ANOVA comparing levels of reciprocal action as a function of relationship type, using residuals that controlled for cost and value, it was found that the effect of relationship types on reciprocal action was significant, $F(2,54) = 4.98$, p = .009. Post hoc contrasts revealed that participants indicated significantly more reciprocal action toward friends (M = 2.93, SD = 1.08) than toward acquaintances (M = 2.31, SD = 1.07), $F(2,54) = 6.30$, p = .015. Participants also indicated significantly more reciprocal action toward siblings (M = 3.01, SD = 1.06), than toward acquaintances, $F(2,54) = 7.87$, p = .007. Participants did not indicate significantly more reciprocal action toward siblings than toward friends (See Table 6).

A within-subjects ANOVA comparing levels of verbal reciprocity between relationship types, using residuals that controlled for cost and value, showed that relationship type's effect was not significant, $F(2,54) = 1.87$, p = .159.

Effect of Post-Benefit Contact on Gratitude and Reciprocity

Significant results were not in line with the original hypothesis that individuals would be more grateful and reciprocating toward acquaintances than toward siblings and close friends. After further review of the relevant literature, I arrived at a new post-hoc hypothesis. Based on Trivers's work (1971), I arrived at the hypothesis that, especially in large societies with high dispersal rates such as the society in which this study's participants live, the emotional or physical investments associated with gratitude and reciprocation toward acquaintances (i.e. people with whom the recipient is unlikely to have high levels of future contact) may be too risky. Based on the concept that gratitude's function is to promote reciprocal exchange of benefits, and assuming that with acquaintances the probability of future interaction is lower, I investigated whether recipients had significantly more face to face interaction with siblings and friends than with acquaintances in the following two months. Though placing a two-month limit on the amount of interaction does not capture expectations of lifetime future interaction, no such question existed within the study measures.

To test this post-hoc hypothesis, a within-subjects ANOVA analysis comparing levels of post-benefit contact between relationship types was performed, while controlling for cost and value by using a cost and value residualized measure of post-benefit contact. The effect of relationship type on post-benefit contact was significant $F(2,54) = 5.54$, $p = .005$. Mauchly's Test of Spherecity was significant ($W = .82$, $p = .006$) since the error covariance matrix of the orthonormalized transformed dependent variables was not proportionate to an identity matrix. Accordingly, degrees of freedom were adjusted using Huynh-Feldt epsilon to correct for violating the assumption of

sphericity. The effect of relationship type on post-benefit contact was still significant even after this correction $F(1.748,54) = 5.54$, $p = .007$. It was found that recipients had significantly more post-benefit contact in the subsequent two months with friends ($M = 33.61$, $SD = 23.5$) than with acquaintances ($M = 18.65$, $SD = 18.3$), $F(1,55) = 15.65$, $p = .001$ (means represent estimated number of contacts with the benefactor in the two months following the benefit). It was also found that recipients had significantly more post-benefit contact in the subsequent two months with siblings ($M = 27.14$, $SD = 26.0$) than with acquaintances, $F(1,55) = 4.56$, $p = .037$. Additional contrasts found that participants' post-benefit contact with siblings was not significantly different from their post-benefit interaction with friends (see Table 6).

Mediating Effect of Post-Benefit Contact on Recipient Gratitude

To investigate the effect of post-benefit contact on recipients' gratitude, analyses were conducted to test whether post-benefit contact in the two following months mediated the relationship between relationship type and the cost- and benefit-residualized measure of gratitude. Relationship type was measured using two dummy coded variables, with one dummy variable comparing the difference between siblings and acquaintances regarding gratitude and another dummy variable comparing the difference between friends and acquaintances regarding gratitude. Regressing gratitude on relationship type demonstrated that relationship type was not a significant predictor of recipients' gratitude. Furthermore, I then tested whether the mediator (post-benefit contact) affects the outcome variable (gratitude) while controlling for the initial variable(s) (the dummy coded measures of relationship type). Results show that post-benefit contact does not significantly predict gratitude when controlling for relationship

type. Thus, according to these results, post-benefit contact did not meet Baron and Kenny's (1986) criteria as a mediator of the relationship between relationship type and gratitude.

Additionally, Sobel Tests were performed to test the significance of post-benefit contact as a mediator of the relationship between relationship type and gratitude. Sobel (1982) explained that this test of mediation determines the significance of the indirect effect of the mediator by testing the hypothesis there is no significant difference between the total effect and the direct effect within the meditational model. A Sobel Test revealed that post-benefit contact did not mediate the association between being a friend (vs. acquaintance) and gratitude (Sobel's t = 0.332 p = 0.740). A second Sobel Test revealed that post-benefit contact also did not mediate the association between being a sibling (vs. acquaintance) and gratitude (Sobel's t = 0.329 p = 0.742).

Mediating Effect of Post-Benefit Contact on Recipients' Urge to Reciprocate

To further investigate the effect of post-benefit contact on recipients' urge to reciprocate, analyses were conducted to test whether post-benefit contact in the two following months mediated the relationship between relationship type and the cost- and benefit- residualized measure of urge to reciprocate. Regressing urge to reciprocate on relationship type demonstrated that relationship type was a significant predictor of recipients' urge to reciprocate. More specifically, the dummy-coded variable contrasting benefits by friends with benefits by acquaintances (β = .22) was a significant predictor of recipient urge to reciprocate (p = .005).

Next, in accordance with Baron and Kenny's (1986) criteria, the potential mediator (post-benefit contact) was regressed on the putative independent variable

(relationship type). Relationship type significantly predicted post-benefit contact. Benefits from siblings vs. acquaintances (β = .20) and benefits from friends vs. acquaintances (β = .19) both significantly predicted post-benefit contact (p = .029 and p = .033 respectively).

In accordance with Baron and Kenny's (1986) criteria, I then tested whether the mediator (post-benefit contact) affects the outcome variable (urge to reciprocate) while controlling for the initial variable(s) (the dummy coded measures of relationship type). Results show that post-benefit contact does not significantly predict urge to reciprocate when controlling for relationship type. Thus, according to these results, post-benefit contact did not meet Baron and Kenny's (1986) criteria as a mediator of the relationship between relationship type and urge to reciprocate.

Additionally, Sobel Tests were also performed to investigate the significance of post-benefit contact as a mediator of the relationship between relationship type and urge to reciprocate. A Sobel Test revealed that post-benefit contact did not mediate the association between being a friend (vs. acquaintance) and urge to reciprocate (Sobel's t = 0.655 p = 0.512). A second Sobel Test revealed that post-benefit contact also did not mediate the association between being a sibling (vs. acquaintance) and urge to reciprocate (Sobel's t = 0.636 p = 0.525).

Mediating Effect of Post-Benefit Contact on Reciprocal Action

To investigate the effect of post-benefit contact on recipients' reciprocal actions, analyses were conducted in keeping with criteria outlined by Baron and Kenny (1986) to test whether post-benefit contact in the two following months mediated the relationship between relationship type and reciprocal action. To establish that there was a relationship

to be mediated, I regressed reciprocal action on relationship type using two dummy-coded variables representing friends [vs. acquaintances] and siblings [vs. acquaintances], respectively). Results demonstrated that relationship type significantly predicted reciprocal action. More specifically, sibling benefits (β = .18) and friends benefits (β = .17) were both significant predictors of recipient reciprocal action (p = .029 and p = .033 respectively).

Next, analyses were conducted to test whether the putative independent variable (relationship type) was correlated with the putative mediator (post-benefit contact). In accordance with Baron and Kenny's (1986) criteria, the potential putative mediator (post-benefit contact) was regressed on the two dummy variables representing relationship type. Results demonstrated that relationship type significantly predicted post-benefit contact. More specifically, sibling benefits (β = .19) and friends benefits (β = .31) were both significant predictors of post-benefit contact (p = .03 and p < .01 respectively).

According to Baron and Kenny's (1986) criteria, I then tested whether the putative mediator (post-benefit contact) affected the putative outcome variable (reciprocal action) while controlling for the putative independent variable (relationship type). Post-benefit contact (β = .19) significantly predicted reciprocal action even when controlling for relationship type (p < .01). Finally, to further establish that post-benefit contact mediates the relationship between relationship type and reciprocal action, the effect of the putative independent variable (relationship type) on the putative outcome variable (reciprocal action), controlling for the putative mediator (post-benefit contact) was tested. In this model, relationship type did not significantly predict reciprocal action. More specifically, neither sibling benefits (β = .14) nor friends benefits (β = .12) were

significant predictors of reciprocal action. Thus, according to these results, post-benefit contact meets Baron and Kenny's (1986) most stringent criteria for mediation of the association of relationship type with reciprocal action (see Figure 1).

Additionally, Sobel Tests were performed to confirm the significance of post-benefit contact as a mediator of the relationship between relationship type and reciprocal action. A Sobel Test revealed that post-benefit contact mediated the association between being a friend (vs. acquaintance) and reciprocal action (Sobel's $t = 2.303$ $p = 0.021$). A second Sobel Test revealed that post-benefit contact did not mediate the association between being a sibling (vs. acquaintance) and reciprocal action, however, though it was marginally statistically significant (Sobel's $t = 1.739$ $p = 0.082$).

Moderating Effect of Relationship Type on the Association of Gratitude with Urge to Reciprocate

I also investigated whether relationship type moderates the association of gratitude with participants' urge to respond prosocially. This was done using within-subject moderation analyses to investigate whether participants expressed more gratitude in reference to benefits received by acquaintances than in response to benefits by siblings and close friends.

To do so, I conducted three regression equations. For each relationship type, the urge to reciprocate scale was regressed on the three predictors (benefit cost, benefit value, and gratitude). The resulting unstandardized coefficients and standard errors associated with gratitude, which appear in Table 7, were then compared by determining whether gratitude's unstandardized regression coefficient (B value) for each relationship type was outside of the two other relationship types' B values' 95% confidence intervals. Based on

this analysis, it was found that gratitude was significantly less strongly associated with urge to reciprocate for acquaintances (B = .30, SE = .08) than for either siblings (B = .57, SE = .12) or friends (B = .55). There was no significant difference between siblings and friends regarding the association of gratitude with urge to reciprocate.

Moderating Effect of Relationship Type on the Association of Gratitude with Verbal Reciprocity

To find out whether relationship type significantly moderated the relationship between gratitude and verbal reciprocation, three regression equations were conducted. For each relationship type, the verbal reciprocation scale was regressed on the three predictors (benefit cost, benefit value, and gratitude). The resulting unstandardized coefficients and standard errors associated with gratitude were then compared by determining whether gratitude's B value for each relationship type was outside of the other B values' 95.0% confidence intervals. Gratitude was significantly less strongly associated with verbal reciprocation when benefactors were acquaintances (B = .07, SE = .09) than when they were siblings (B = .51, SE = .13) or friends (B = .378, SE = .14). There was no significant difference between siblings and friends regarding the association of gratitude with verbal reciprocation (See Table 8).

Moderating Effect of Relationship Type with Gratitude and Reciprocal Action

Three regression equations were conducted to find out whether relationship type significantly moderated the relationship between gratitude and reciprocal action. For each relationship type, the reciprocal behavior scale was regressed on the three predictors (benefit cost, benefit value, and gratitude). The resulting unstandardized coefficients and standard errors associated with gratitude were then compared by determining whether

gratitude's B value for each relationship type was outside of the other B values' 95.0% confidence intervals. Gratitude was significantly less strongly associated with reciprocal behavior when benefactors were acquaintances (B = .05, SE = .10) than when they were siblings (B = .49, SE = .15) or friends (B = .45, SE = .15). There was no significant difference between siblings and friends regarding the effectiveness of gratitude in bringing about reciprocal behavior (See Table 9).

Study 2: Participant as Benefactor

Preliminary Analyses

Missing data were present for several study variables, but were not indicative of systematic response bias. The majority of study variables had no missing data. Means, standard deviations, and internal consistency reliabilities for major study variables appear in Table 10. The correlations among major study variables appear in Tables 12 through 14.

Residual Analyses

After confirming that measures had acceptable levels of internal consistency, I examined several variables that may confound the relationship between gratitude and relationship type (namely, the perceived value of the benefit to the recipient and the perceived cost of the benefit to the benefactor). I did so by performing a one-way within-subjects Analysis of Variance (ANOVA) for each potential confounding variable, whereby the three scores for each subject (one for each relationship type) were compared to one another. Based on these analyses, I found that the effect of relationship type on perceive benefit cost was significant, $F(2,56) = 15.457$, $p > .001$. However, Mauchly's Test of Spherecity was significant ($W = .89$, $p = .033$) since the error covariance matrix of

the orthonormalized transformed dependent variables was not proportionate to an identity matrix. Accordingly, degrees of freedom were adjusted using Huynh-Feldt epsilon to correct for violating the assumption of sphericity. The effect of relationship type on post-benefit contact was still significant even after this correction $F(1.849,56) = 15.457$, $p < .001$. Also, the effect of relationship type on perceive benefit value was significant, $F(2,56) = 6.35$, $p = .002$ (See Table 14). Consequently, benefit cost and value were statistically controlled through an Analysis of Covariance (ANCOVA) analysis. This analysis entailed stacking the data of all three relationship types into one data set with 180 rows, regressing gratitude on benefit cost and value, calculating a regression residual for each row, placing the resulting residuals back into their original position based on participant number and relationship type, and then comparing the resulting residuals to evaluate the main hypothesis. Similar residuals were computed for prosocial response variables. Therefore, when I examine differences in gratitude, verbal reciprocity, or prosocial action below, those differences by relationship type are statistically equated on perceived benefit cost and perceived benefit value.

Effects of Relationship Type on Levels of Recipient Gratitude

An ANOVA within-subjects analysis comparing recipient gratitude between relationship types was conducted, while controlling for benefit cost and value in the aforementioned manner. In this analysis the effect of relationship type was not significant, $F(2,54) = 1.68$, $p = .192$. Thus, participants perceived their beneficiaries to be equally grateful in all the relationship types.

Effects of Relationship Type on Verbal Reciprocity

An ANOVA within-subjects analysis comparing recipient verbal reciprocity between relationship types, while controlling for cost and value, showed that the effect of relationship type was not significant, $F(2,56) = 2.12$, $p = .125$. Therefore, participants' beneficiaries were equally verbally reciprocal in all the relationship types.

Effects of Relationship Type on Reciprocal Action

A within-subjects ANOVA analysis comparing levels of reciprocal action between relationship types, using residuals that controlled for cost and value, showed that relationship type's effect was not significant, $F(2,53) = 1.89$, $p = .157$. Thus, participants did not indicate receiving significantly different amounts of reciprocal action between relationship types.

Moderating Effect of Relationship Type on the Association of Gratitude with Verbal Reciprocity

To find out whether relationship type significantly moderated the relationship between gratitude and verbal reciprocation, three regression equations were conducted. For each relationship type, the verbal reciprocation scale was regressed on the three predictors (benefit cost, benefit value, and gratitude). The resulting unstandardized coefficients and standard errors associated with gratitude were then compared by determining whether gratitude's B value for each relationship type was outside of the other B values' 95.0% confidence intervals. There was no significant difference between siblings (B = .38, SE = .07), friends (B = .37, SE = .09), or acquaintances (B = .32, SE = .11) regarding the association of gratitude with verbal reciprocation.

Moderating Effect of Relationship Type with Gratitude and Reciprocal Action

Three regression equations were conducted to find out whether relationship type significantly moderated the relationship between gratitude and reciprocal action. For each relationship type, the reciprocal behavior scale was regressed on the three predictors (benefit cost, benefit value, and gratitude). The resulting unstandardized coefficients and standard errors associated with gratitude were then compared by determining whether gratitude's B value for each relationship type was outside of the other B values' 95.0% confidence intervals. There was no significant difference between siblings (B = .13, SE = .10), friends (B = .24, SE = .11), or acquaintances (B = .14, SE = .11) regarding the effectiveness of gratitude in bringing about reciprocal action.

Chapter 4: Discussion

Direct reciprocity is pervasive among humans and throughout the animal kingdom, and species that use this behavioral strategy are thought to enjoy many benefits (Trivers, 1971). Some scholars even posit that our ancestors' abilities to work together with individuals other than genetic relatives (viz., parents, siblings, and offspring) for food, protection, and childcare may have helped us become Earth's most dominant vertebrate (Nowak, 2006; Pennisi, 2005). Although repeated incidences of reciprocal altruism between non-kin can improve reproductive fitness for all individuals involved, making use of reciprocal altruism involves first overcoming anxieties about the possibility that the resources invested will not be repaid (Trivers, 1971; Bartlett & DeSteno, 2006).

The anxiety that prosocial behaviors might not be reciprocated may explain findings that people tend to grant fewer favor requests from strangers than from close friends and kin (Han, Li, & Hwang, 2005; Fujisawa, Kutsukake, & Hasegawa, 2008). As overcoming this worry seems to be an essential step in forming new mutually beneficial relationships, it is possible that mechanisms have evolved to help foster the establishment of reciprocal relationships among humans. Additionally, according to the theory of reciprocal altruism, sharing with one's kin does not need a reciprocity-based mechanism to insure the exchange of benefits. The reasoning behind this proposal is that, since people share up to 50% of their genes with their kin, it is in people's genetic self-interest, by virtue of inclusive fitness (Hamilton, 1964), to deliver benefits to their kin that enhance those relatives' reproductive success, whether or not those relatives are likely to pay them back in the future. Furthermore, based on the theory that gratitude is an emotion

that was naturally selected on the basis of its ability to (a) alert one to individuals in one's environment who can provide novel and important benefits, and (b) motivate efforts to reciprocate those benefits, I hypothesized that gratitude would be more salient when benefits are rendered by strangers and acquaintances than by well-known individuals in already-established reciprocal relationships or in kin relationships. In support of this theoretical expectation that gratitude is somewhat superfluous to kin altruism, Bar-Tal, Bar-Zohar, Greenberg, and Hermon (1977) found that participants reported anticipating the most gratitude if the favor had been rendered by a non-relative than by a relative (though one might anticipate these results to be of limited validity since they were based solely on asking people to imagine how they might feel in hypothetical benefit-receipt situations rather than upon asking people to describe how they actually felt in real-life benefit-receipt situations).

Specifically, based on the assumption that psychological systems for motivating reciprocal exchange of prosocial behaviors among non-kin have been naturally selected in humans, I hypothesized that the emotion of gratitude is an output of this system that motivates reciprocation in response to receipt of such benefits. This hypothesis was based on reciprocal altruism theory's position that, compared to responses toward kin and well-established reciprocal altruism partners, benefactors will depend more on past reciprocation when deciding how to respond to an acquaintance's needs. Since, relative to kin relationship, potential benefactors will have an increased incentive for detecting cheaters in acquaintance reciprocal relationships (that is, individuals who will take benefits without conferring them reciprocally), individuals benefited by acquaintances will have an increased incentive to reciprocate or at least seem as if they are

reciprocating, in comparison to individuals benefitted by kin or close friends. Consequently, I predicted that gratitude selectively felt toward non-kin (especially acquaintances whose propensities to reciprocate are not well-known) would be the mechanism that brought about increased reciprocation toward non-kin, and that in acquaintance relationships, gratitude would be more strongly associated with reciprocal prosocial behavior than it would be among close friends or within sibling relationships (Cosmides & Tooby, 2005).

These predictions were strongly refuted in the present study. Results indicated that benefit recipients endorsed feeling equal amounts of gratitude in all three types of relationships. Also, even after controlling for differences in benefit costs and value, participants felt stronger urges to reciprocate toward existing close relationship partners (i.e., close friends and siblings) than toward acquaintances. Also, participants indicated significantly more reciprocal action toward siblings and friends than toward acquaintances after receiving benefits from these individuals. These latter two findings are exactly the opposite of what I had predicted. Furthermore, gratitude was significantly less strongly associated with reciprocal behavior when benefactors were acquaintances than when they were siblings or friends. In summary, benefit recipients had stronger urges to reciprocate, engaged in more reciprocal prosocial behavior, and were more likely to respond to the feeling of gratitude with reciprocation when benefitted by friends and siblings than when benefited by acquaintances.

Although these findings do not support my hypotheses, these findings might still be harmonized with the theory of reciprocal altruism. More specifically, these findings do not contradict the resulting conclusion that, with all other factors being equal, individuals

benefited by acquaintances will have an increased incentive to reciprocate (or at least seem as if they are reciprocating). These findings, however, *do suggest that other factors are not equal.* Specifically, there are other factors correlated with relationship type that influence an individual's likelihood of feeling grateful and reciprocating, and to the extent that these factors are absent, they might prevent mechanisms designed for reciprocal altruism from creating internal motivations to engage in reciprocal prosocial behavior. Trivers (1971) speculated that altruistic behaviors would be most beneficial to the benefactor's inclusive fitness when the individuals in the reciprocal relationship live a long life, have a low dispersal rate throughout their lives (live in close proximity to each other for long periods of time), and have a high degree of mutual dependence. These factors influence the likelihood of the evolution of mechanisms designed to motivate reciprocation by affecting the likelihood that a future situation will arise in which a recipient can act altruistically toward his or her benefactor.

As these factors are thought to be important in deciding how beneficial an altruistic act will be for a benefactor, it is possible that, just as individuals have evolved mechanisms for detecting and responding to cheaters in reciprocal relationships, individuals also have evolved mechanisms for computing the likelihood of encountering future altruistic situations with a specific relationship partner. Such mechanisms might be used by recipients of altruistic behaviors as a way of detecting the likelihood that resources expended toward reciprocation and expressions of gratitude would be cost-effective. Computations of the likelihood of future interaction with the benefactor could be used in conjunction with other information, such as the likelihood that a recipient's reciprocation will alter his or her benefactor's future responsiveness to his or her needs,

when determining whether or not gratitude and reciprocation are worthwhile in a given situation. Based on this notion that recipients consider the likelihood of encountering future altruistic situations with their benefactors when deciding how to respond to those benefactors, it would seem reasonable that recipients would have decreased motivation to respond prosocially toward acquaintances with whom they will have little contact (and furthermore, that gratitude would be less tightly linked to prosocial responding). If this line of reasoning is correct, computations of the likelihood of subsequent beneficial encounters would lead to decreased reciprocation toward acquaintance benefactors with whom one will have little contact even though a benefactor would generally reciprocate more toward an acquaintance if all other factors were equal. In other words, a well-designed mechanism for reciprocal altruism might be expected to down-regulate when social conditions are not conducive to the establishment of a long-term reciprocal relationship—even if one has nevertheless been the recipient of a gratuitous benefit from an acquaintance.

Accordingly, several analyses from the present study support the hypothesis that the likelihood of future interaction may be correlated with reciprocation toward benefactors. First, people had more face-to-face interaction in the subsequent two months with siblings and friends than with acquaintances. This increased exposure to close friends and siblings may explain the increased tendency to reciprocate benefits toward siblings and close friends. Furthermore, participants' amounts of post-benefit contact with their benefactors mediated the relationship between relationship type and reciprocal action.

Findings also suggest an interesting internal response by beneficiaries toward acquaintance benefactors. More specifically, benefactors had equal amounts of grateful emotion toward all three types of benefactors, yet beneficiaries reported less motivation to reciprocate to acquaintances than toward siblings and good friends. Thus, even though they beneficiaries were equally grateful toward acquaintances, they had less desire to reciprocate. This seems to partially explain why recipients reciprocated less with acquaintances than with siblings or close friends. Furthermore, this suggests that, when environmental conditions are not propitious for reciprocation, some mechanism for reciprocal altruism down-regulates. It may not be simply be that beneficiaries find that they are unable to act upon their desire to reciprocate, as they cannot gain access to the person who helped them. Instead, it seems they do not experience as much desire to reciprocate in the first place. One possibility is that this lack of motivation to reciprocate with acquaintances fosters less post-benefit contact. Another possibility is that it is the lack of post-benefit contact with acquaintances that leads to a reduced motivation to reciprocate. Either, or both, of these explanations may be the case. Regardless of which is the case, both the lack of desire to reciprocate among people benefited by acquaintances and the fact that this is mediated by levels of post-benefit contact are two key findings.

These findings concerning post-benefit contact may help in understanding the aforementioned study by Bar-Tal and colleagues' (1977). In their hypothetical scenario study, they found that gratitude was more readily experienced toward acquaintances and strangers who provided benefits than toward genetic relatives who provided the same benefits. Bar-Tal et al.'s results differ from my finding that people experienced stronger

urges to reciprocate toward existing close relationship partners and did not experience significantly different amounts of grateful emotion toward benefactors in any of the different relationship categories. These differences between the two studies' results, however, may be explained by the possibility that Bar-Tal and colleagues' hypothetical scenario involved strangers and acquaintances with whom the participants expected a *high* likelihood of future exposure. As the hypothetical acquaintances and strangers were individuals who answered the participants' close friend's phone in "the dormitory," it seems there is a high likelihood of future interaction and future opportunities to be once again benefited by these individuals. Moreover, as mentioned above, Bar-Tal et al.'s study only asked participants to indicate how they imagined they would feel in a hypothetical scenario, and researchers have found that people are generally quite unreliable at anticipating their feelings in hypothetical situations (Wilson & Gilbert, 2003).

Results from the first study, involving participants who were beneficiaries, did not replicate for the study involving participants who were benefactors. I hypothesize that this is due to the imprecision associated with asking individuals about their recipient's levels of gratitude. Additionally, benefactors may not have an accurate estimation of how necessary or valuable a benefit was to its recipient. These sorts of imprecision could significantly increase error and obscure results. Another potential source of imprecision associated with asking individuals about their recipient's level of gratitude is that recipient may have reciprocated with a prosocial behavior, but the benefactor may not have realized that the prosocial behavior was a direct response to the initial benefit. For this reason, a more accurate account of reciprocal behaviors requires information from

the recipient regarding their intentions behind any prosocial behaviors that were preceded by a benefit.

Limitations and Directions for Future Work

The current work has several limitations that suggest potentially fruitful directions for future work. First, "acquaintance" is a fairly vague word that can refer to relationships with vast differences. These differences can lead to very disparate ways of emotionally and behaviorally responding to benefits. For example, it is possible that gratitude functions differently depending on whether or not the acquaintance is someone with whom one would like to become friends, as well as whether the acquaintance is someone whom one is likely ever to see again. Future research on this topic could evaluate how these distinctions affect resulting levels of gratitude and reciprocal action.

There are also limitations to the generalizability of this study, as it was confined to studying relationship effects in college students. In the above discussion, geographic proximity for a relatively long period of time was mentioned as a potentially key factor affecting post-benefit responses. As a longitudinal study analyzed by Rindfuss (1991) found that rates of residential mobility peak in the mid-twenties, it is possible that rates of reciprocation for the purpose of relationship formation may be lower in a college sample. The increased chaos and instability in a college environment may lead to disincentives for investing one's resources toward a benefactor with whom you will not be in close proximity for an extended period of time. Also, the so-called *emerging adulthood* phase of life, as described by Arnett (2000), is distinct for identity exploration, high risk behaviors, emotional instability, and several other traits that could complicate attempts to generalize their benefit response style to other populations. Consequently, further

research is recommended before generalizing the results of this study to other populations. One such study could compare post-benefit emotional and behavioral responses of college students with post-benefit responses of individuals in a small community who had no plans of leaving that community for the next 20 years of their lives, for example.

Additionally, as noted above, I did not measure participants' beliefs about the likelihood of post-benefit interaction with their benefactors (in Study 1) and beneficiaries (in Study 2), so post-hoc analyses designed to evaluate the effects of post-benefit interaction on gratitude and its associations with prosocial responding were based on a measure of the amount of post-benefit interaction in the following two months. I think of this item as only a rough estimate of participants' beliefs about the likelihood of post-benefit interaction because expected amounts of post-benefit interaction do not necessarily match actual amounts of post-benefit interaction. As participants' beliefs about the amount of future interaction may be a major factor when recipients decide whether or not to reciprocate, a more sensitive measure of this construct may help in understanding this decision-making process. Also, opportunities to do a favor for someone extend beyond two months, so a question only measuring post-benefit interaction in the following two months may not be sensitive to beliefs about more long term mutually beneficial relationships.

Future studies could investigate whether or not the aforementioned measure of post-benefit contact was adequate, and further investigate how post-benefit contact relates to gratitude and reciprocation. For example, a prospective longitudinal study could extend these results in the direction of greater cause-and-effect rigor. Also, future studies

could investigate post-benefit contact and recipient computations of post-benefit contact as distinct factors. Experimental research related to post-benefit contact is another area for future work that seems important. For example, an experimental study could investigate whether or not manipulating levels of post-benefit contact alters resulting levels of reciprocation or desire to reciprocate.

Conclusion

There are several factors that make gratitude toward strangers and acquaintances evolutionarily beneficial, such as their ability to provide novel and important benefits. These factors are still thought to selectively increase an acquaintance's likelihood of feeling gratitude and reciprocating benefits with a benefactor. Nonetheless, computations concerning whether or not an acquaintance will have the opportunity to reciprocate may be of equal or greater influence when deciding whether or not to invest in a benefactor. More specifically, the likelihood of subsequent exposure to acquaintances may be a particularly important consideration when a benefit recipient is deciding whether or not to reciprocate. This consideration seems especially influential in large societies with high dispersal rates, such as the one in which most humans now live. The emotional or physical investments associated with reciprocation toward acquaintances with whom one is not likely to interact in the future may simply be too risky. If, however, the benefactor is an acquaintance with whom the recipient will have a high likelihood of being exposed for an extended period of time, then recipients may experience more gratitude toward that acquaintance rather than toward a close friend or kin with a similar likelihood of future interaction. As the effect of relationship type on reciprocal action was found to no longer be significant when controlling post-benefit contact, this possibility seems very likely.

I found it especially noteworthy that post-benefit contact predicts recipients' reciprocal action even when controlling for relationship type, and that it completely mediates the relationship between relationship type and reciprocal action. These findings shed light on the previously underappreciated role that post-benefit interaction might have in fostering reciprocal prosocial behavior. Further investigation on the role of post-benefit contact could potentially lead to a richer understanding of gratitude, as well as effective techniques for fostering mutually beneficial relationships.

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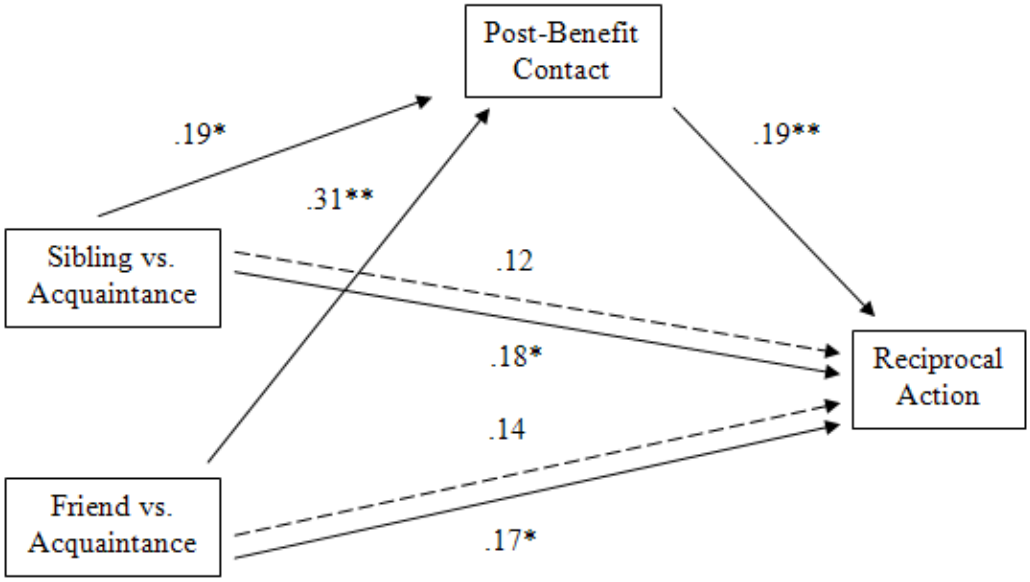
Notes

[1] Several concerns were considered when controlling for confounding variables using residual values. First, dividing study participants' three benefit events and stacking all benefit events into one row ignores potential dependencies among cases nested within each participant. Second, this technique also neglects the possibility that the dependent variables are correlated with the predictors to different degrees for different individuals. Also, this technique of statistical control inflates the type I error rates above their normal levels. These concerns, however, are only pertinent when evaluating the significance of predictors in the regression equation. In this instance, the technique was only used to get residualized estimates for each individual. Biases based on dependency among cases are therefore not a concern for these estimates.

Figures

Figure 1. Mediating Effect of Post-Benefit Contact on Reciprocal Action: Standardized Parameter Estimates.



Note. *$p < .05$, **$p < .01$. Dashed lines represent the direct effect of each dummy coded predictor variable on the dependent variable. Above analyses controlled for benefit cost and value.

Tables

Table 1

Means, Standard Deviations, and Alpha Reliabilities for Major Variables in Study 1

Measure	Mean	Standard Deviation	Alpha Reliability
Closeness / Commitment to Sibling	7.63	1.29	.90
Closeness / Commitment to Friend	7.03	1.24	.87
Closeness / Commitment to Acquaintance	4.15	2.06	.96
Sibling Benefit Value	6.94	2.46	.74
Friend Benefit Value	7.17	2.30	.83
Acquaintance Benefit Value	6.09	2.60	.80
Benefit Cost to Sibling	5.95	2.04	.81
Benefit Cost to Friend	5.57	2.05	.83
Benefit Cost to Acquaintance	4.59	2.40	.91
Gratitude toward Sibling	6.39	.80	.78
Gratitude toward Friend	6.47	.91	.93
Gratitude toward Acquaintance	6.11	1.36	.95
Urge to Reciprocate toward Sibling	3.83	.88	.85
Urge to Reciprocate toward Friend	3.94	.80	.83
Urge to Reciprocate toward Acquaintance	3.29	.95	.89
Verbal Reciprocity toward Sibling	3.31	1.02	.79
Verbal Reciprocity toward Friend	3.29	1.00	.72

Verbal Reciprocity toward Acquaintance	2.86	.96	.72

Table 1 (*continued)*

Measure	Mean	Standard Deviation	Alpha Reliability
Reciprocal Action toward Sibling	3.01	1.06	.88
Reciprocal Action toward Friend	2.93	1.08	.87
Reciprocal Action toward Acquaintance	2.31	1.07	.89
Post-Benefit Contact with Sibling	27.14	26.01	-- [a]
Post-Benefit Contact with Friend	33.64	23.52	-- [a]
Post-Benefit Contact with Acquaintance	18.65	18.28	-- [a]

Note. [a]Scale was a single item, so reliability could not be established.

Table 2

Intercorrelations Between Study's Major Variables for Siblings in Study 1

Variable	1	2	3	4	5	6	7	8
1. Closeness / Commitment	--	-.01	.03	.34	.28	.23	.41	-.19
2. Benefit Value		--	.24	.24	.23	.05	.05	.03
3. Perceived Benefit Cost			--	.13	.39	.53	.45	-.04
4. Gratitude				--	.57	.43	.39	.09
5. Urge to Reciprocate					--	.69	.79	-.06
6. Verbal Reciprocity						--	.75	-.17
7. Reciprocal Action							--	.09
8. Post-Benefit Contact								--

Note. Correlations > .16 are statistically significant, $p < .05$.

Table 3

Intercorrelations Between Study's Major Variables for Friends in Study 1

Variable	1	2	3	4	5	6	7	8
1. Closeness / Commitment	--	.10	.15	.37	.36	.20	.37	.11
2. Benefit Value		--	.25	.36	.31	.21	.03	.29
3. Perceived Benefit Cost			--	.24	.38	.37	.31	-.18
4. Gratitude				--	.69	.42	.38	.04
5. Urge to Reciprocate					--	.73	.70	.12
6. Verbal Reciprocity						--	.68	.10
7. Reciprocal Action							--	.08
8. Post-Benefit Contact								--

Note. Correlations $> .16$ are statistically significant, $p < .05$.

Table 4

Intercorrelations Between Study's Major Variables for Acquaintances in Study 1

Variable	1	2	3	4	5	6	7	8
1. Closeness / Commitment	--	.21	.50	.26	.62	.42	.61	.50
2. Benefit Value		--	.22	.40	.33	.39	.26	.28
3. Perceived Benefit Cost			--	.27	.53	.53	.56	.21
4. Gratitude				--	.56	.32	.26	.15
5. Urge to Reciprocate					--	.64	.73	.24
6. Verbal Reciprocity						--	.67	.20
7. Reciprocal Action							--	.46
8. Post-Benefit Contact								--

Note. Correlations > .16 are statistically significant, $p < .05$.

Table 5

Means and standard deviations for control variables for overall group in Study 1, broken down by relationship type

Variable	*M*	*SD*	*F-value*
Benefit Cost			
Overall group	5.39	2.21	$F(2,54) = 10.84$, $p < .001$
Sibling	5.95	2.07	
Friend	2.57	2.09	
Acquaintance	4.59	2.36	
Benefit Value			
Overall group	6.74	2.50	$F(2,54) = 3.15$, $p = .040$
Sibling	6.94	2.51	
Friend	7.17	2.31	
Acquaintance	6.09	2.62	

Table 6

Significant within-subject ANOVA analyses, with means and standard deviations for overall group in Study 1, broken down by relationship type

Variable	*M*	*SD*	*F-value*
Urge to Reciprocate			
Overall group	3.70	.88	F(2,54) = 8.01, p = .001
Sibling	3.83	.88	
Friend	3.94	.80	
Acquaintance	3.29	.95	
Reciprocal Action			
Overall group	2.76	1.11	F(2,54) = 4.98, p = .009
Sibling	3.01	1.06	
Friend	2.93	1.08	
Acquaintance	2.31	1.07	
Post-Benefit Contact			
Overall group	26.42	23.51	F(1.748,54) = 5.54, p = .007
Sibling	27.14	26.03	
Friend	33.61	23.52	
Acquaintance	18.65	18.28	

Table 7

Study 1 Summary of Resulting Unstandardized Coefficients from Three Separate Multiple Regression Analyses (One Regression for Each Relationship Type) for Gratitude Predicting Urge to Reciprocate

			95.0% Confidence Interval for B	
Variable	B	S.E.	Lower Bound	Upper Bound
Sibling	.569[a]	.115	.338	.800
Friend	.553[a]	.087	.379	.728
Acquaintance	.295[b]	.078	.138	.452

Note. All regressions controlled for benefit cost and value. Coefficients with different superscripts fall outside of each others' 95% confidence intervals.

Table 8

Study 1 Summary of Resulting Unstandardized Coefficients from Three Separate Multiple Regression Analyses (One Regression for Each Relationship Type) for Gratitude Predicting Verbal Reciprocity

			95.0% Confidence Interval for B	
Variable	B	S.E.	Lower Bound	Upper Bound
Sibling	.515[a]	.132	.251	.780
Friend	.378[a]	.138	.101	.655
Acquaintance	.067[b]	.087	-.108	.242

Note. All regressions controlled for benefit cost and value. Coefficients with different superscripts fall outside of each others' 95% confidence intervals.

Table 9

Study 1 Summary of Resulting Unstandardized Coefficients from Three Separate Multiple Regression Analyses (One Regression for Each Relationship Type) for Gratitude Predicting Reciprocal Action

			95.0% Confidence Interval for B	
Variable	B	S.E.	Lower Bound	Upper Bound
Sibling	.488[a]	.149	.190	.786
Friend	.453[a]	.153	.147	.759
Acquaintance	.051[b]	.099	-.148	.249

Note. All regressions controlled for benefit cost and value. Coefficients with different superscripts fall outside of each others' 95% confidence intervals.

Table 10

Items Used in Study's Major Variables for Study 1

Variable	Items Used
Closeness / Commitment	Appendix B: Items 1-4.
	Appendix C: Items 1-15 (Reverse Scored: 5, 7, 10, & 14)
Benefit Value	Appendix D: Items 5 & 6
Perceived Benefit Cost	Appendix D: Items 1-4 & 7
Gratitude	Appendix E: Items 1, 4, & 14
Urge to Reciprocate	Appendix F: Items 1, 3, 5, 6, 10, 16, & 21
Verbal Reciprocity	Appendix G: Items 1, 4, 8, & 9
Reciprocal Action	Appendix G: Items 3, 7, 10, 17, 18, 22, & 25
Post-Benefit Contact	Appendix A: Item 6

Table 11

Means, Standard Deviations, and Alpha Reliabilities for Major Variables in Study 2

Measure	Mean	Standard Deviation	Alpha Reliability
Closeness / Commitment to Sibling	7.31	1.13	.85
Closeness / Commitment to Friend	6.75	1.46	.93
Closeness / Commitment to Acquaintance	4.02	1.78	.95
Sibling Benefit Value	7.59	2.27	.85
Friend Benefit Value	7.56	2.18	.83
Acquaintance Benefit Value	6.53	2.40	.80
Benefit Cost to Sibling	4.99	1.76	.74
Benefit Cost to Friend	4.96	1.92	.80
Benefit Cost to Acquaintance	3.63	2.20	.90
Gratitude toward Sibling	5.79	1.35	.87
Gratitude toward Friend	6.16	1.24	.93
Gratitude toward Acquaintance	6.01	1.19	.90
Verbal Reciprocity toward Sibling	2.67	.89	.63
Verbal Reciprocity toward Friend	2.97	.92	.67
Verbal Reciprocity toward Acquaintance	2.78	1.07	.81
Reciprocal Action toward Sibling	2.38	.96	.82
Reciprocal Action toward Friend	2.49	.92	.82
Reciprocal Action toward Acquaintance	2.04	.96	.88

Table 12

Intercorrelations Between Study's Major Variables for Siblings in Study 2

Variable	1	2	3	4	5	6
1. Closeness / Commitment	--	.37	.15	.12	-.02	-.07
2. Benefit Value		--	.32	.19	.09	-.09
3. Perceived Benefit Cost			--	.09	.29	.14
4. Gratitude				--	.59	.15
5. Verbal Reciprocity					--	.50
6. Reciprocal Action						--

Note. Correlations > .16 are statistically significant, $p < .05$.

Table 13

Intercorrelations Between Study's Major Variables for Friends in Study 2

Variable	1	2	3	4	5	6
1. Closeness / Commitment	--	.55	.26	.44	.22	.12
2. Benefit Value		--	.33	.49	.35	.13
3. Perceived Benefit Cost			--	.06	.26	.22
4. Gratitude				--	.54	.30
5. Verbal Reciprocity					--	.70
6. Reciprocal Action						--

Note. Correlations > .16 are statistically significant, $p < .05$.

Table 14

Intercorrelations Between Study's Major Variables for Acquaintances in Study 2

Variable	1	2	3	4	5	6
1. Closeness / Commitment	--	.15	.64	.34	.21	.50
2. Benefit Value		--	.22	.50	.42	-.01
3. Perceived Benefit Cost			--	.23	.41	.51
4. Gratitude				--	.51	.18
5. Verbal Reciprocity					--	.54
6. Reciprocal Action						--

Note. Correlations > .16 are statistically significant, $p < .05$.

Table 15

Means and standard deviations for control variables for overall group in Study 2, broken down by relationship type

Variable	*M*	*SD*	*F-value*
Benefit Cost			
Overall group	4.52	1.56	$F(1.85,56) = 15.457$, $p < .001$
Sibling	4.99	1.76	
Friend	4.96	1.92	
Acquaintance	3.63	2.20	
Benefit Value			
Overall group	7.24	1.73	$F(2,56) = 6.35$, $p = .002$
Sibling	7.59	2.27	
Friend	7.56	2.20	
Acquaintance	6.53	2.40	

Table 16

Items Used in Study's Major Variables for Study 2

Variable	Items Used
Closeness / Commitment	Appendix I: Items 1-4. Appendix J: Items 1-15 (Reverse Scored: 5, 7, 10, & 14)
Benefit Value	Appendix K: Items 5 & 6
Perceived Benefit Cost	Appendix K: Items 1-4 & 7
Gratitude	Appendix L: Items 1, 4, & 14
Verbal Reciprocity	Appendix M: Items 1, 4, 8, & 9
Reciprocal Action	Appendix M: Items 3, 7, 10, 17, 18, 22, & 25
Post-Benefit Contact	Appendix H: Item 6

Appendices

Appendix A

1. What gender is the person who helped you?

(A) Male
(B) Female

2. What race is the person who helped you?

(A) White
(B) Black or African American
(C) Asian
(D) American Indian and Alaska Native
(E) Native Hawaiian and Other Pacific Islander
(F) Other (Please explain) _____

3. What ethnicity is the person who helped you?

(A) Hispanic or Latino
(B) Not Hispanic or Latino

4. Approximately how old is the person who helped you? Please provide your best estimate of their age: _____ years old.

5. Approximately how long ago did this event occur?_____

6. On average, how often did you see _____ **in the two months following this specific time** when he/she helped you? Please circle one of the following responses.

(A) Every day
(B) A few times a week
(C) Once a week
(D) 1-3 times a month
(E) Once in those two months.
(F) Not at all during those two months.

Appendix A *(continued)*

7. How long had you known the person who helped you?

(A) Not at all
(B) A few days or less
(C) 1-4 weeks
(D) 1-3 months
(E) 3-6 months
(F) 6 months to a year
(G) 1-2 Years
(H) 2-4 Years
(I) 5-10 Years
(J) 10-14 Years
(K) 15 Years or more

Appendix B

Closeness/Commitment Scale – Participant as Recipient

The following questions are about how you felt about the person BEFORE he or she helped you. Circle one answer for each question on the scale from 0 = Not at all to 10 = Extremely before going on to the next question.

1. On a scale from 0 to 10, please indicate how **close** you were to the person prior to him or her doing this good thing for you.

Not close at all 1	**2**	**3**	**4**	**5**	**6**	**Extremely close 7**

2. On a scale from 0 to 10, please indicate how **committed** you were to the person prior to him or her doing this good thing for you.

Not committed at all 1	**2**	**3**	**4**	**5**	**6**	**Extremely committed 7**

3. Compared to your relationships with other people in your life, how **important** was this relationship to you prior to him or her doing this good thing for you?

Not important at all 1	**2**	**3**	**4**	**5**	**6**	**Extremely important 7**

4. Using the diagrams below, please indicate which picture best describes how close you think this relationship was prior to him or her doing this good thing for you.

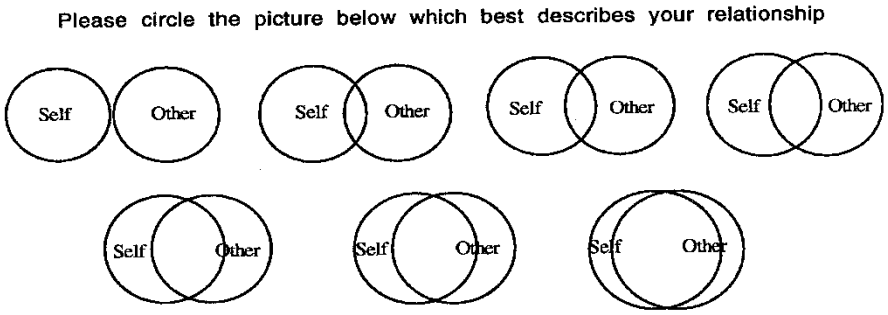


Figure 1. The Inclusion of Other in the Self (IOS) Scale.

Appendix C

Communal Strength Scale: Participant as Recipient

Keep in mind the specific person helped you. Please answer the following questions regarding how you felt about this person **before he/she helped you.** As you answer each question, fill in the person's initials in the blank. Circle one answer for each question on the scale from 0 = *Not at all* to 10 = *Extremely* before going on to the next question.

1. How far would you have been willing to go to visit ____?

Not far at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely far 10**

2. How happy did you feel when doing something that helps ____?

Not happy at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely happy 10**

3. How large a benefit would you have been likely to give ____?

Not large at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely large 10**

4. How large a cost would you have incurred to meet a need of ____?

Not large at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely large 10**

5. How readily could you put the needs of ____ out of your thoughts?

Not readily at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely readily 10**

6. How high a priority for you was meeting the needs of ____?

Not high at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely high 10**

7. How reluctant would you have been to sacrifice for ____?

Not reluctant at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely reluctant 10**

Appendix C *(continued)*

8. How much would you have been willing to give up to benefit ____?

Not willing at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely willing 10**

9. How far would you have gone out of your way to do something for ____?

Not far at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely far 10**

10. How easily could you have accepted not helping ____?

Not easily at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely easily 10**

11. Assuming you could, how likely would you be to drive_____ to an airport an hour away at a moment's notice?

Not likely at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely likely 10**

12. How happy would you feel about buying dinner for _____?

Not happy at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely happy 10**

13. If you were to hear someone talking badly about _____, how likely would you be to say something in defense of him/her?

Not likely at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely likely 10**

14. How reluctant would you be to skip class for _____ if they were emotionally distressed and said they needed to talk with you?

Not reluctant at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely reluctant 10**

15. How willing would you be to give _____ your ticket to a band you liked if you knew that he/she liked this band much more?

Not much at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**An extreme amount 10**

Appendix D

Benefit Cost and Value Scale – Participant as Recipient

The following questions are about what you thought about this person's help RIGHT AFTERWARD. Please circle one answer for each question on the scale from 0 = Not at all to 10 = Extremely before going on to the next question.

1. Please indicate how much **effort** this person put into doing the good thing that he or she did for you.

No effort at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**An extreme amount of effort 10**

2. Please indicate how **costly** it was for this person to do this good thing for you.

Not costly at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely costly 10**

3. Please indicate how **far out of his/her way** this person had to go to do this good thing for you.

Not far at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely far 10**

4. How much did this person have to sacrifice to help you?

No Sacrifice at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extreme sacrifice 10**

5. How badly did you want the help that this person provided to you?

I didn't really want it at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**I wanted it a great deal 10**

6. How badly did you need the help that this person provided to you?

I didn't really need it at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**I had a great need for it. 10**

Appendix D *(continued)*

7. Please indicate how much **time** this person invested in doing the good thing that he/she did for you.

No time at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**An extreme amount of time. 10**

8. How much money, in dollars, do you think you would have had to spend to get this help for yourself if you had had to pay for it? For example, if it was a gift that you otherwise would have had to purchase in a store, or if it was a favor that you otherwise would have had to pay someone to do for you, how much would you have had to spend to get it for yourself? (Please write the amount, in dollars, on the blank below)

_____Dollars

9. How much money, in dollars, do you think you would have been *willing* to spend to get this gift or help for yourself if you had had to pay for it? For example, if it was a gift that you otherwise would have had to purchase in a store, or if it was a favor that you otherwise would have had to pay someone to do for you, how much would you have been willing to spend to get it for yourself? (Please write the amount, in dollars, on the blank below)

_____Dollars

10. Please indicate how **intentionally** this person did this good thing for you. In other words, to what extend did he or she *mean* to do something that would benefit you?

Not intentional at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely intentional 10**

11. Please indicate how **obligated** this person was to do this good thing for you? In other words, to what extend do you think that this person felt compelled or required to help you?

Not obligated at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely obligated 10**

Appendix D *(continued)*

12. Please indicate the extent to which this person did this good thing for you **just because he/she wanted to.**

Not at all because he/she wanted to 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Completely because he/she wanted to 10**

13. Please indicate the extent to which this person was acting **selflessly** by doing this good thing for you.

Not selflessly at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely selflessly 10**

14. Please indicate the extent to which this person helped you in hopes of getting a favor or gift from you in return.

Did not at all seem to hope for something in return 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Very much seemed to be hoping for something in return 10**

Appendix E

Post-Benefit Gratitude Checklist – Participant as Recipient

Using the scale below, please indicate the extent to which you experienced the following feelings right after the person helped you.

Completely disagree 1 2 3 4 5 6 7 Completely agree

"Right after the person did this nice thing for me, I felt. . ."

	Completely Disagree						Completely Agree
1. Appreciative	1	2	3	4	5	6	7
2. Grateful	1	2	3	4	5	6	7
3. Thankful	1	2	3	4	5	6	7

Appendix F

Action Tendency Scale: Participant as Recipient

Please indicate (by circling a single number for each item) the extent to which you **felt the urge to** do the following things toward this person RIGHT AFTER he/she helped you.

"Right after he or she gave me the gift (or did the favor for me), I felt the urge to..."

	Not at all	A little	Slightly	Quite a bit	To a great extent
1. Thank him/her	1	2	3	4	5
2. Avoid him/her	1	2	3	4	5
3. Help him/her	1	2	3	4	5
4. Compliment him/her	1	2	3	4	5
5. Express my gratitude toward him/her	1	2	3	4	5
6. Do something nice for him/her	1	2	3	4	5
7. Praise him/her	1	2	3	4	5
8. Be around him/her	1	2	3	4	5
9. Get a gift for him/her	1	2	3	4	5
10. Repay him/her	1	2	3	4	5
11. Deepen my relationship with him/her	1	2	3	4	5
12. Approach him/her	1	2	3	4	5
13. Make physical contact with him/her (for example, kiss, hug, or shake hands)	1	2	3	4	5
14. Offer to share something with him/her	1	2	3	4	5
15. Suggest that the two of us cooperate in accomplishing some sort of task	1	2	3	4	5
16. Try to make him/her happy	1	2	3	4	5
17. Tell him/her a joke or a funny story	1	2	3	4	5
18. Let other people know what he/she did for me	1	2	3	4	5
19. Offer him/her a handshake	1	2	3	4	5
20. Do something for him/her that he/she asked me to do	1	2	3	4	5
21. Do a favor for him/her	1	2	3	4	5
22. Keep him/her at a distance	1	2	3	4	5
23. Ignore him/her	1	2	3	4	5
24. Suggest that we engage in an enjoyable activity together	1	2	3	4	5
25. Take him/her out for a meal or something to eat	1	2	3	4	5

Appendix G

Behavioral Responses to Benefit Scale – Participant as Recipient

Please indicate (by circling a single number for each item) the extent to which you **ACTUALLY DID** the following things toward this person after he or she helped you.

"Right after he or she did this good thing for me I..."

	Not at all	A little	Slightly	Quite a bit	To a great extent
1. Thanked him/her	1	2	3	4	5
2. Avoided him/her	1	2	3	4	5
3. Helped him/her	1	2	3	4	5
4. Complimented him/her	1	2	3	4	5
5. Did something fun with him/her	1	2	3	4	5
6. Expressed my gratitude toward him/her	1	2	3	4	5
7. Did something nice for him/her	1	2	3	4	5
8. Praised him/her	1	2	3	4	5
9. Promised to repay him/her	1	2	3	4	5
10. Gave a gift to him/her	1	2	3	4	5
11. Repaid him/her	1	2	3	4	5
12. Approached him/her	1	2	3	4	5
13. Made physical contact with him/her (hugged, kissed or shook hands with him/her).	1	2	3	4	5
14. Tried to hug him/her or hold his/her hand	1	2	3	4	5
15. Offered to share something with him/her	1	2	3	4	5
16. Suggested that the two of us cooperate in accomplishing some sort of task	1	2	3	4	5
17. Took him/her out for a meal or something to eat	1	2	3	4	5
18. Tried to make him/her happy.	1	2	3	4	5
19. Told him/her a joke or a funny story	1	2	3	4	5
20. Touched him/her in a friendly or caring way	1	2	3	4	5
21. Told other people what he/she did for me.	1	2	3	4	5
22. Did a favor for him/her	1	2	3	4	5
23. Offered him/her a handshake	1	2	3	4	5
24. Suggested that we engage in an enjoyable activity together	1	2	3	4	5
25. Did something for him/her that he/she asked me to do.	1	2	3	4	5

Appendix H

1. What gender is the person who you helped?

(A) Male
(B) Female

2. Approximately how old is the person who you helped? Please provide your best estimate: _____years old.

3. What race is the person who you helped?

(A) White
(B) Black or African American
(C) Asian
(D) American Indian and Alaska Native
(E) Native Hawaiian and Other Pacific Islander
(F) Other (Please explain) _____

4. What ethnicity is the person who you helped?

(A) Hispanic or Latino
(B) Not Hispanic or Latino

5. Approximately how long ago did this event occur? _____

6. On average, how often did you see _____ **in the two months following this specific time** when you help him/her? Please circle one of the following responses.

(A) Every day
(B) A few times a week
(C) Once a week
(D) 1-3 times a month
(E) Once in those two months.
(F) Not at all during those two months.

7. How long had you known the person who you helped?

(A) Not at all
(B) A few days or less
(C) 1-4 weeks
(D) 1-3 months
(E) 3-6 months
(F) 6 months to a year
(G) 1-2 Years
(H) 2-4 Years
(I) 5-10 Years
(J) 10-14 years
(K) 15 years or more

Appendix I

Closeness/Commitment scale – Participant as Benefactor

The following questions are about how you felt about the person BEFORE you helped him/her. Circle one answer for each question on the scale from 0 = Not at all to 10 = Extremely before going on to the next question.

1. On a scale from 0 to 10, please indicate how **close** you were to the person prior to you doing this good thing for him/her.

Not close at all 1	**2**	**3**	**4**	**5**	**6**	**Extremely close 7**

2. On a scale from 0 to 10, please indicate how **committed** you were to the person prior to you doing this good thing for him/her.

Not committed at all 1	**2**	**3**	**4**	**5**	**6**	**Extremely committed 7**

3. Compared to your relationships with other people in your life, how **important** was this relationship to you prior to you doing this good thing for him/her?

Not important at all 1	**2**	**3**	**4**	**5**	**6**	**Extremely important 7**

4. Using the diagrams below, please indicate which picture best describes how close you think this relationship was prior to you doing this good thing for him/her.

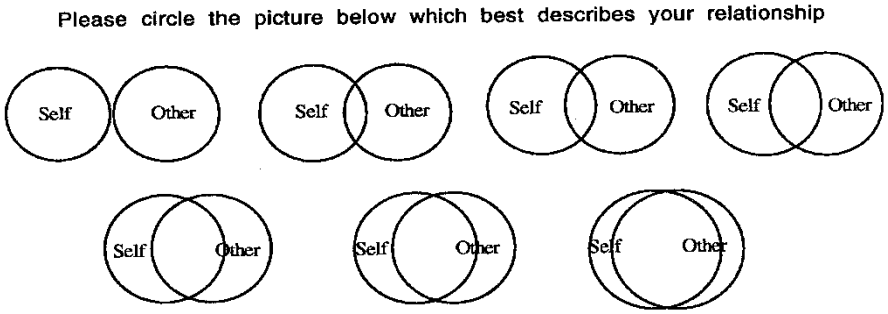


Figure 1. The Inclusion of Other in the Self (IOS) Scale.

Appendix J

Communal Strength Scale: Participant as Benefactor

Keep in mind the specific person who you did the favor for. Please answer the following questions regarding how you felt about this person **before you helped him/her.** As you answer each question, fill in the person's initials in the blank. Circle one answer for each question on the scale from 0 = *Not at all* to 10 = *Extremely* before going on to the next question.

1. How far would you have been willing to go to visit ____?

Not far at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely far 10**

2. How happy did you feel when doing something that helps ____?

Not happy at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely happy 10**

3. How large a benefit would you have been likely to give ____?

Not large at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely large 10**

4. How large a cost would you have incurred to meet a need of ____?

Not large at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely large 10**

5. How readily could you put the needs of ____ out of your thoughts?

Not readily at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely readily 10**

6. How high a priority for you was meeting the needs of ____?

Not high at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely high 10**

7. How reluctant would you have been to sacrifice for ____?

Not reluctant at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely reluctant 10**

8. How much would you have been willing to give up to benefit ____?

Not much at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**An extreme amount 10**

9. How far would you have gone out of your way to do something for ____?

Not far at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely far 10**

10. How easily could you have accepted not helping ____?

Not easily at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely easily 10**

11. Assuming you could, how likely would you be to drive_____ to an airport an hour away at a moment's notice?

Not likely at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely likely 10**

12. How happy would you feel about buying dinner for _____?

Not happy at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely happy 10**

13. If you were to hear someone talking badly about _____, how likely would you be to say something in defense of him/her?

Not likely at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely likely 10**

14. How reluctant would you be to skip class for _____ if they were emotionally distressed and said they needed to talk with you?

Not reluctant at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely reluctant 10**

15. How willing would you be to give _____ your ticket to a band you liked if you knew that he/she liked this band much more?

Not willing at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely willing 10**

Appendix K

Benefit Cost and Value Scale – Participant as Benefactor

The following questions are about help that YOU PROVIDED to the person in question.

1. On a scale from 0 to 10, please indicate how much **effort** you put into doing the good thing that you did for this person.

No effort at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**An extreme amount of effort 10**

2. On a scale from 0 to 10, please indicate how **costly** it was for you to do this good thing for this person.

Not costly at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely costly 10**

3. On a scale from 0 to 10, please indicate how **far out of your way** you had to go to do this good thing for this person.

Not far at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely far 10**

4. How much did you have to sacrifice to provide this help for this person?

No Sacrifice at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extreme sacrifice 10**

5. How badly do you think this person wanted the help that you provided to him/her?

He/she didn't really want it at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**He/she wanted it a great deal 10**

6. How badly do you think this person needed the help that you provided to him/her?

He/she didn't really need it at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**He/she had a great need for it 10**

7. On a scale from 0 to 10, please indicate how much **time** you invested in doing the good thing that you did for this person.

No time at all 0	1	2	3	4	5	6	7	8	9	An extreme amount of time 10

8. How much money, in dollars, do you think this person would have had to spend to get help for himself/herself if this person had had to pay for it? For example, if it was a gift that this person otherwise would have had to purchase in a store, or if it was a favor that this person otherwise would have had to pay someone to do for him/her, how much do you think this person would have had to spend to get it for himself/herself? (Please write the amount, in dollars, on the blank below)

_____Dollars

9. On a scale from 0 to 10, please indicate how **intentionally** you did this good thing for this person. In other words, to what extend did you *mean* to do something that would benefit this person?

Not intentional at all 0	1	2	3	4	5	6	7	8	9	Extremely intentional 10

10. On a scale from 0 to 10, please indicate how **obligated** you were to do this good thing for this person? In other words, to what extend do you think that you felt compelled or required to help this person?

Not obligated at all 0	1	2	3	4	5	6	7	8	9	Extremely obligated 10

11. On a scale from 0 to 10, please indicate to what extent you did this good thing for this person **just because you wanted to.**

Not at all because I wanted to 0	1	2	3	4	5	6	7	8	9	Completely because I wanted to 10

12. On a scale from 0 to 10, please indicate to what extent you were acting **selflessly** by doing this good thing for this person.

Not selflessly at all 0	1	2	3	4	5	6	7	8	9	Extremely selflessly 10

13. On a scale from 0 to 10, please indicate to what extent you helped this person in hopes of getting a favor or gift from them in return?

I was not at all hoping for	1	2	3	4	5	6	7	8	9	I Was Very much hoping

something in return 0										**for something in return 10**

14. On a scale from 0 to 10, please indicate what extent you were **trying** to do something good for this person**.**

Not trying at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Totally trying 10**

Appendix L

Post-Benefit Perceived Gratitude Checklist – Participant as Benefactor

Using the scale below, please indicate the extent to which it seemed as if the person to whom you provided help experienced the following feelings right after you helped him/her.

Completely disagree 1 2 3 4 5 6 7 Completely agree

"Right after I did this nice thing for this person, it seemed that he/she felt. . ."

	Completely Disagree						Completely Agree
1. Appreciative	1	2	3	4	5	6	7
2. Grateful	1	2	3	4	5	6	7
3. Thankful	1	2	3	4	5	6	7

Appendix M

Behavioral Responses to Benefit Scale – Participant as Benefactor

Please indicate (by circling a single number for each item) the extent to which this person did the following things toward you after you helped him/her.

"Right after I did this good thing for him/her, this person..."

	Not at all	A little	Slightly	Quite a bit	To a great extent
1. Thanked me	1	2	3	4	5
2. Avoided me	1	2	3	4	5
3. Helped me	1	2	3	4	5
4. Complimented me	1	2	3	4	5
5. Did something fun with me	1	2	3	4	5
6. Expressed his/her gratitude toward me	1	2	3	4	5
7. Did something nice for me	1	2	3	4	5
8. Praised me	1	2	3	4	5
9. Promised to repay me	1	2	3	4	5
10. Gave a gift to me	1	2	3	4	5
11. Repaid me	1	2	3	4	5
12. Approached me	1	2	3	4	5
13. Made physical contact with me (hugged, kissed or shook hands with me).	1	2	3	4	5
14. Tried to hug me or hold my hand	1	2	3	4	5
15. Offered to share something with me	1	2	3	4	5
16. Suggested that the two of us cooperate in accomplishing some sort of task	1	2	3	4	5
17. Took me out for a meal or something to eat	1	2	3	4	5
18. Tried to make me happy	1	2	3	4	5
19. Told me a joke or a funny story	1	2	3	4	5
20. Touched me in a friendly or caring way	1	2	3	4	5
21. Did a favor for me	1	2	3	4	5
22. Offered me a handshake	1	2	3	4	5
23. Suggested that we engage in an enjoyable activity together	1	2	3	4	5
24. Agreed to do a favor for me.	1	2	3	4	5

Appendix N

Please answer the following questions regarding **how you currently feel** about this person**.**

1. How willing would you be to help this person in the future?

Not far at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely far 10**

2. How satisfied were you with the way this person responded to you after you helped him/her?

Not satisfied at all 0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Extremely satisfied 10**